

# **APPENDIX A**

## *Initial Study/NOP*







NORTH ORANGE COUNTY  
COMMUNITY COLLEGE DISTRICT

April 9, 2018

**To:** Distribution List

**From:** North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, California 92801-1819

**Subject: Notice of Preparation of a Draft Environmental Impact Report for the Fullerton College Sherbeck Field Improvements Project**

The North Orange County Community College District (District) will be the lead agency and will prepare an environmental impact report (EIR) for the proposed project identified below. The District is requesting your view regarding the scope and content of the environmental information to be included in the EIR. Responsible agencies are requested to indicate their statutory responsibilities in connection with the proposed project.

The description, location, and the potential environmental effects resulting from the proposed project are contained in the initial study, which is available through the District's website (<http://www.nocccd.edu/>), Fullerton College's website ([www.fullcoll.edu/campusprojects](http://www.fullcoll.edu/campusprojects)) and at the Administrative Offices, North Orange County Community College District, Anaheim, campus located at the address above. The initial environmental review indicates that the proposed project may have potentially significant effects on the environment in the following categories: aesthetics, air quality, greenhouse gas emissions, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, tribal cultural resources, and mandatory findings of significance. The EIR will include an analysis of these impact areas, as well as feasible mitigation measures and alternatives to avoid or reduce potential impacts.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but no later than 30 days after receipt of this notice. A public scoping meeting will be held on Tuesday, May 1, 2018, beginning with a Project Presentation at 6:00 p.m. in the Fullerton College Campus Theatre (Building 1300) located at 321 E. Chapman Avenue, Fullerton, CA 92832, followed by an Informational Open House in the Fullerton College Center (Building 200), Rooms 224, 226, and 228.

Please send your response to Mr. Richard Williams at the address shown above. Please provide the name of a contact person in your agency.

## **Notice of Preparation**

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**Project Title:** Fullerton College Sherbeck Field Improvements Project

**Project Location:** Sherbeck Field (northeastern portion of the Fullerton College campus). Fullerton College is generally bounded by North Berkeley Avenue to the north and east, North Lemon Street to the west, and East Chapman Avenue to the south.

**Proposed Project:** The College plans to install permanent prefabricated aluminum bleachers, six field lighting stanchions, a new sound system, press box, and storage building at the existing Sherbeck Field. Sherbeck Field would continue to be used for academic instruction, competitive athletics, and rentals; however, Sherbeck Field is proposed to host competitive football games, which are currently held at other locations. The inclusion of field lighting as part of the project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more class options for students who may not be able to take physical education during the day. It is anticipated that these improvements would begin in spring 2019 and would last approximately 6 months.

A handwritten signature in black ink, appearing to read "Richard Williams", written over a horizontal line.

Richard Williams

District Director, Facilities Planning and Construction

# **DRAFT**

## **Initial Study for the Sherbeck Field Improvements Project**

*Prepared for:*

**North Orange County Community College District  
Facilities Planning and Construction**

1830A West Romneya Drive

Anaheim, California 92801-1819

*Contact: Richard Williams, District Director Facilities Planning and Construction*

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# **APRIL 2018**



# Initial Study for the Sherbeck Field Improvements Project

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## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page No.</u></b>
<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>III</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 California Environmental Quality Act Compliance .....	1
1.2 Purpose of the Notice of Preparation and Initial Study .....	1
1.3 Availability of the Notice of Preparation and Initial Study .....	1
<b>2 PROJECT LOCATION AND SETTING.....</b>	<b>3</b>
2.1 Project Location .....	3
2.2 Existing Site Conditions .....	3
2.3 Existing Programming .....	3
<b>3 PROJECT DESCRIPTION .....</b>	<b>15</b>
3.1 Background and Project History .....	15
3.2 Project Objectives .....	15
3.3 Field Improvements .....	15
3.4 Proposed Programming.....	18
3.5 Construction Activities .....	29
<b>4 PUBLIC REVIEW PROCESS .....</b>	<b>31</b>
<b>5 SUMMARY OF FINDINGS .....</b>	<b>33</b>
<b>6 INITIAL STUDY CHECKLIST .....</b>	<b>35</b>
6.1 Aesthetics .....	41
6.2 Agriculture and Forestry Resources.....	43
6.3 Air Quality .....	45
6.4 Biological Resources .....	48
6.5 Cultural Resources .....	53
6.6 Geology and Soils .....	57
6.7 Greenhouse Gas Emissions.....	61
6.8 Hazards and Hazardous Materials .....	62
6.9 Hydrology and Water Quality.....	69
6.10 Land Use and Planning .....	75
6.11 Mineral Resources .....	76
6.12 Noise .....	77
6.13 Population and Housing.....	80
6.14 Public Services.....	81
6.15 Recreation .....	83

# Initial Study for the Sherbeck Field Improvements Project

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## TABLE OF CONTENTS (CONTINUED)

<b><u>Section</u></b>	<b><u>Page No.</u></b>
6.16 Transportation and Traffic .....	84
6.17 Tribal Cultural Resources .....	86
6.18 Utilities and Service Systems.....	88
6.19 Mandatory Findings of Significance.....	93
<b>7 REFERENCES AND PREPARERS.....</b>	<b>95</b>
7.1 References Cited .....	95
7.2 List of Preparers .....	101

## APPENDICES

A	IS/NOP Distribution List
B	Biological Investigation
C	Cultural Resources Report

## FIGURES

1	Project Location .....	103
2	Existing Project Site.....	105
3	Proposed Site Plan .....	107
4a	Sherbeck Field Improvements Visual Simulations.....	109
4b	Sherbeck Field Improvements Visual Simulations.....	111

## TABLES

1	Sherbeck Field 2016/2017 Academic Year Schedule and Programming .....	7
2	Proposed Sherbeck Field Schedule and Programming .....	21
3	City of Fullerton Interior and Exterior Noise Standards.....	78

## Initial Study for the Sherbeck Field Improvements Project

### ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AB	Assembly Bill
BMP	best management practice
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
City	City of Fullerton
CMP	Congestion Management Program
CRHR	California Register of Historical Resources
District	North Orange County Community College District
DTSC	Department of Toxic Substances Control
EIR	environmental impact report
GHG	greenhouse gas
IS	initial study
LOS	level of service
mgd	million gallons per day
MM	Mitigation Measure
NOP	notice of preparation
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
PM <sub>10</sub>	particulate matter with an aerodynamic diameter equal to or less than 10 microns
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter equal to or less than 2.5 microns
PRC	California Public Resources Code
project	Sherbeck Field Improvements Project
RWQCB	Regional Water Quality Control Board
SR	State Route
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
UST	underground storage tank



## **Initial Study for the Sherbeck Field Improvements Project**

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# **Initial Study for the Sherbeck Field Improvements Project**

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## **1 INTRODUCTION**

### **1.1 California Environmental Quality Act Compliance**

The California Environmental Quality Act (CEQA) serves as the main framework of environmental law and policy in California. CEQA emphasizes the need for public disclosure and identifying and preventing environmental damage associated with proposed projects. Unless the project or program is deemed categorically or statutorily exempt, CEQA is applicable to any project or program that must be approved by a public agency in order to be processed and established. The proposed project considered herein does not fall under any of the statutory or categorical exemptions listed in the 2016 CEQA Statute and Guidelines (California Public Resources Code [PRC] Section 21000 et seq.; 14 California Code of Regulations [CCR] 15000 et seq.), and, therefore, must meet CEQA requirements.

Considering the proposed project has the possibility of creating a significant impact, the preparation of an environmental impact report (EIR) is required by CEQA. Furthermore, as required by CEQA Guidelines Section 15126.6, the North Orange County Community College District (District) will include the consideration and discussion of Alternatives to the Proposed Project in the EIR.

### **1.2 Purpose of the Notice of Preparation and Initial Study**

The intent of this document is to provide an overview and analysis of the environmental impacts associated with the proposed implementation of the Sherbeck Field Improvements Project (project) for Fullerton College by the District. This document is accessible to the public, in accordance with CEQA, to receive feedback and input on topics to be discussed in the EIR.

### **1.3 Availability of the Notice of Preparation and Initial Study**

The initial study/notice of preparation (IS/NOP) for Fullerton College is being distributed directly to numerous agencies, organizations, and interested groups and persons during the scoping period (see Appendix A for the IS/NOP distribution list). The IS/NOP is also available for review at the following locations:

- North Orange County Community College District Headquarters, 1830A W. Romneya Drive, Anaheim, California 92801
- Fullerton Public Library, 353 W Commonwealth Ave, Fullerton, California 92832

In addition, the IS/NOP is available online through the North Orange County Community College District website (<http://www.nocccd.edu/>) and the Fullerton College website (<http://www.fullcoll.edu/campusprojects/>).

## **Initial Study for the Sherbeck Field Improvements Project**

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## 2 PROJECT LOCATION AND SETTING

### 2.1 Project Location

Sherbeck Field is located in the northeastern portion of the Fullerton College campus. Student Parking Lots 4 and 5 are located immediately north and west of the project site. Farther north are the Horticulture Building 1600 Complex and Child Development classrooms. North Berkeley Avenue borders the eastern side of the field, and farther east are single-family residences. Softball, baseball, and soccer fields are located south of Sherbeck Field.

Fullerton College is located at 321 East Chapman Avenue in the City of Fullerton (City) and occupies an approximately 70-acre site in northern Orange County. The City is surrounded by La Habra and Brea to the north, Placentia to the east, Anaheim to the south, and Buena Park to the west. Figure 1, Project Location, shows the campus's regional location. Specifically, Fullerton College is bounded by residential development to the north, south, and east, and Fullerton Union High School to the west.

### 2.2 Existing Site Conditions

Fullerton College is part of the North Orange County Community College District (District). Fullerton College was formed in 1913 and is the District's oldest campus. As one of the first community colleges operating in California, it afforded students the opportunity to complete the first 2 years of college within their community. Fullerton College currently houses 51 permanent and temporary buildings that occupy 549,115 assignable square feet, or 815,734 gross square feet. The campus is compact and designed with multistory buildings and few interior roadways. A portion of the Fullerton Union High School campus is on the Fullerton College campus. The project site is zoned as Public Land (P-L), and the general plan (i.e., The Fullerton Plan) land use designation for the project site is School (City of Fullerton 2012a).

Sherbeck Field is 4.36 acres and consists of a turf football field that is surrounded by a 400-meter-long track. A two-story field house is located on the western edge of the field (Fullerton College 2017). Sherbeck Field currently does not have permanent seating or lighting (see Figure 2, Existing Project Site). There is a scoreboard located at the eastern end of the field.

### 2.3 Existing Programming

Sherbeck Field is currently used for academic instruction, competitive athletics, and rentals. A description of these uses is provided below. Table 1 provides a schedule of the existing uses per semester for the 2016/2017 academic year. Scheduling and programming can vary, but the 2016/2017 academic year provides the most current representation of programming and scheduling at Sherbeck Field.

## **Initial Study for the Sherbeck Field Improvements Project**

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### **Academic Instruction**

Fullerton College currently offers intercollegiate athletic courses for track and field, cross country, football, and soccer, as well as various fitness courses. Courses are offered on weekdays only and are offered in the mornings, afternoon, and evenings. The earliest classes begin at 6:20 a.m. and the latest classes end at 7:05 p.m. Course sizes typically range from 24 to 32 students.

### **Athletics**

#### ***Football***

Sherbeck Field is used for in-season football practice in the fall and off-season conditioning and skill development in the spring, which are typically held on weekdays in the afternoon and evening for approximately 2 hours. There are approximately 80 practice sessions in the 16-week fall semester (Saghieh 2017a).

Saturday afternoon and occasional evening games are currently held at the Yorba Linda High School field. Football games typically last for three and a half to four hours. There are approximately five regular and up to two playoff football games per year, with approximately 350 to 1,600 attendees per game (Saghieh 2017b).

#### ***Soccer***

Sherbeck Field is used for soccer practice, which is typically held on weekdays in the morning for 2 hours. There are approximately 80 practice sessions in the 16-week fall semester (Saghieh 2017a).

Friday evening games are held at Sherbeck Field. Soccer games typically last for 2 hours. There are approximately two soccer games per year with approximately 100 attendees per game (Saghieh 2017c).

#### ***Track and Field***

Sherbeck Field is used for track and field practice from Mondays through Fridays during the fall and spring semester. Team practices occur during the morning from 7:00 a.m. to 9:00 a.m. and during the afternoon from 12:00 p.m. to 2:00 p.m. There are approximately 80 practice sessions in the 16-week fall semester.

Track and field events are held at Sherbeck Field. Fullerton College track and field competition events occur on Fridays only and the frequency is only one track and field event per year during the spring semester at Fullerton College, usually from 10:00 a.m. to 4:00 p.m. There are approximately 100 attendees at competition events.

## **Initial Study for the Sherbeck Field Improvements Project**

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Orange Lutheran High School uses the Fullerton College track in the spring and hosts up to four track meets per year, usually on a Tuesday, Wednesday or Thursday. Practice and meets are held in the afternoon from 3:00 p.m. to 6 p.m. and events include approximately 150 attendees.

### **Rentals**

Fullerton College rents out Sherbeck Field for private schools to host athletic courses and practice. Specifically, Hope International University, Rosary High School, CDA Slammers, Anaheim Soccer, Seahorse Soccer, CAL South, Troy High School, Prep Football America Camp, and Orange Lutheran rent Sherbeck Field for athletic practice sessions. Additionally, Sherbeck Field is rented out by the Buena Park Police Department three times per year for training purposes (Saghieh 2017c). Sherbeck Field is rented out at various times on weekdays, Saturdays, and Sundays, as shown in Table 1.

### **Commencement Ceremony**

The annual commencement ceremony occurs in late May or early June at Sherbeck Field. Student check-in typically occurs from 8:00 to 9:30 a.m. Commencement is held on Saturday and typically begins at 10:00 a.m. and ends in the afternoon. There are approximately 7,200 students and guests that attend the commencement ceremony (Saghieh 2017c).

## **Initial Study for the Sherbeck Field Improvements Project**

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Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Spring Semester (2017)							
6:00 AM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
7:00 AM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	—
8:00 AM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
9:00 AM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
10:00 AM	Conditioning for Athletes 7:00 AM –10:20 AM  Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
11:00 AM	Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Body Conditioning and Fitness 11:45 AM–1:10 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Body Conditioning and Fitness 11:45 AM–1:10 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
12:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM



Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer (Rental) 7:30 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
2:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
3:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
4:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
5:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
6:00 PM	—	—	—	—	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 7:00 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
7:00 PM	—	—	—	—	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
8:00 PM	—	—	—	—	—	—	—
9:00 PM	—	—	—	—	—	—	—
10:00 PM	—	—	—	—	—	—	—

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
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Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:30 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
3:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:30 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:30 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
5:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:30 AM – 6:00 PM	Soccer or Other (Rental) 8:00 AM – 6:00 PM
6:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
7:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—

Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 PM	—	—	—	—	—	—	—
9:00 PM	—	—	—	—	—	—	—
10:00 PM	—	—	—	—	—	—	—
Fall Semester (2016 and 2017)							
6:00 AM	Soccer or Other (Rental) 6:00 AM – 5:30 PM  Cross Country 6:30 AM – 8:25 AM	Soccer or Other (Rental) 6:00 AM – 6:00 PM  Cross Country 6:30 AM – 8:25 AM	Soccer or Other (Rental) 6:00 AM – 6:00 PM  Cross Country 6:30 AM – 8:25 AM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM  Cross Country 6:30 AM – 8:25 AM	—	—
7:00 AM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
8:00 AM	Cross Country 6:30 AM – 8:25 AM  Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Cross Country 6:30 AM – 8:25 AM  Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
9:00 AM	Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Boot Camp Workout; Conditioning for Athletes – Strength Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
10:00 AM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
11:00 AM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
12:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 6:00 PM	Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
1:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
2:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
3:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
4:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM

Table 1  
Sherbeck Field 2016/2017 Academic Year Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
5:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 6:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 5:30 PM	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
6:00 PM	—	—	—	—	—	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
7:00 PM	—	—	—	—	—	Soccer or Other (Rental) 7:00 AM – 7:30 PM	Soccer or Other (Rental) 7:00 AM – 7:00 PM
8:00 PM	—	—	—	—	—	—	—
9:00 PM	—	—	—	—	—	—	—
10:00 PM	—	—	—	—	—	—	—

### 3 PROJECT DESCRIPTION

#### 3.1 Background and Project History

Sherbeck Field was originally constructed in 1956 to 1957. The field was renamed in 1992 after Coach Hal Sherbeck (Fullerton College Centennial 2017). The field house, existing turf, and rubberized track were constructed in 2010 (California Community Colleges 2016).

Sherbeck Field improvements were initially analyzed in the Facilities Master Plan Initial Study (Dudek 2016). However, this project was removed from the Facilities Master Plan EIR because it was determined that the Sherbeck Field improvements were a separate action from the Master Plan, because the two projects have independent utility.

Funding for the Sherbeck Field improvements would come from several years of savings generated from accumulated campus fund carryover (Saghieh pers. comm. 2017d). Sherbeck Field improvements would not come from Measure J funds.

#### 3.2 Project Objectives

The proposed project's main objectives are as follows:

- Provide field lighting to allow for more evening class options for the physical education program to meet student demand.
- Provide a football field for the Fullerton College football program that meets the sizing requirements of the California Community College Athletic Association Regulations, Bylaw 4.2.6 A.
- Install permanent bleachers to reduce the costs associated with renting bleachers for the annual Fullerton College commencement ceremony.

#### 3.3 Field Improvements

Figure 3 shows the proposed site plan for Sherbeck Field. Figure 4 shows the visual simulations of the Sherbeck Field improvements.

#### Construction and Installation

##### *Bleachers*

The proposed project would involve installation of 4,417 permanent prefabricated aluminum bleachers. On the home side of the field (south), 2,861 seats would be provided, and on the



## Initial Study for the Sherbeck Field Improvements Project

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visitor side (north), 1,556 seats would be provided. The height of the bleachers would be approximately 19 feet high on the home side<sup>1</sup> and 14 feet high on the visitor side.

### *Lighting*

There would be a total of six field lighting stanchions. Two stanchions would be located on the visitor side of the field (north). One stanchion would be located on the west side of the field (F1), while the other would be located on the east side (F2). The F1 stanchion would be located north of the western-most row of the bleachers. The F2 stanchion would be located north of the east bleacher ramp. The F1 and F2 stanchions would be approximately 100 feet tall. Football light fixtures would be located at a height of approximately 25 feet and 100 feet. Egress, or house, light fixtures would be located at a height of approximately 80 feet. F1 and F2 would individually have a power load of 16.9 kilowatts (kW).

Two stanchions would be located on the home side of the field (south). One stanchion would be located on the west side of the field (F3), while the other would be located on the east side (F4). The F3 stanchion would be located south of the west bleacher ramp and the F4 stanchion would be located south of the east bleacher ramp. The F3 and F4 stanchions would be approximately 120 feet tall. Football light fixtures would be located at a height of approximately 30 feet and 120 feet. House light fixtures would be located at a height of approximately 80 feet. F3 and F4 would individually have a power load of 19.6 kW.

One stanchion would be located on the eastern edge of the field (P1) and one on the western edge of the field (P2). The P1 stanchion would be located south of an access gate. The P2 stanchion would be located south of the scoreboard. The P1 and P2 stanchions would be approximately 60 feet tall. Track light fixtures would be located at a height of approximately 60 feet. P1 and P2 would individually have a power load of 3.45 kW.

The total power load of the field lighting would be 79.9 kW. The stanchions would be made of galvanized steel and would be grey or silver.

On Monday through Thursday evenings, field lights would operate until 9:15 p.m. to accommodate classes and rentals, and house lights would operate until 9:30 p.m. to allow students to exit the field safely. On Friday evenings, field lights would operate until 8:15 p.m. at the latest, and house lights would operate until 8:30 p.m. at the latest to allow students to exit the field safely. On Saturday evenings, field lights would operate until 10:00 p.m. at the latest, and house lights would operate

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<sup>1</sup> The press box would be located on the home side and would be approximately 9 feet tall. Therefore, the press box would reach approximately 28 feet tall, including the height of the bleachers.

## **Initial Study for the Sherbeck Field Improvements Project**

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until 10:30 p.m. at the latest to accommodate football games. On Sunday evenings, field lights would operate until 6:00 p.m. at the latest to accommodate soccer rentals.

### ***Sound System***

A sound system would be installed and used for athletic competition events only. The sound system would not be used for classes or rentals, although outside organizations renting the facility could bring their own sound system, if needed. There would be 12 speaker arrays in total. Seven speaker arrays, which would be 36 feet high, would be located behind the bleachers on the east side of the field. . Five speaker arrays, which would be 33 feet high, would be located behind the bleachers on the west side of the field. The speakers and speaker poles would be silver in color.

For a daytime Fullerton College football game, the sound system would be employed from 12:00 p.m. until approximately 5:00 p.m. In the event of the occasional Saturday evening football game, the sound system would operate until 10:00 p.m. If a Fullerton College soccer match was to be held in the evening, the sound system would be employed from 5:00 p.m. to approximately 8:00 p.m. For a Fullerton College track and field event, the sound system would be employed from approximately 1:00 p.m. to 5:00 p.m.

### ***Press Box***

The press box would be located on the home side of the field and would be on top of the bleachers. The press box would be divided into three portions: the home press box, coaches' box, and visitor's press box. The press box would be 9 feet tall and would reach 28 feet tall at the top of the bleachers. The home and visitor press boxes would each be approximately 15 feet long and 9 feet deep and would house the home and visitor coaches. The 24 feet long and 9 feet deep box would house the Sport Information Director, statistician, announcer, score keeper, score clock operator, radio and television broadcasters, and local media and press. A railing would be provided on top of the press box. Windows would be located across the front of the press box, and two interior doors and two exterior doors would be provided. In total, the press box would be approximately 500 square feet in area and would not have roof access or elevator access.

### ***Storage Building***

A storage building would be installed west of the visitor bleachers. The building would be 14 feet tall, 30 feet wide, and 20 feet deep, for a total area of 600 square feet. A roll up door would be provided for easy access.

# Initial Study for the Sherbeck Field Improvements Project

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## *Scoreboard*

No new scoreboard would be provided as part of the project. The existing scoreboard, located at the eastern side of the field, would be used.

## **3.4 Proposed Programming**

Sherbeck Field would be used for academic instruction, competitive athletics, and rentals. A description of these uses is provided below. Table 2 provides a schedule of the proposed uses per semester. Because much of the proposed programming would remain the same from the existing schedule, new programming elements are provided in **bold** text.

### **Academic Instruction**

Fullerton College would continue to offer courses for track and field, cross country, football, and soccer, as well as various fitness courses. Courses would be offered on weekdays only in the mornings, afternoons, and early evenings before nightfall. The inclusion of field lighting as part of the field improvements project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more class options for students who may not be able to take physical education during the day. The earliest classes would begin at 6:20 a.m. and the latest classes would end at 9:15 p.m. Course sizes would range from 24 to 32 students (Saghieh 2017c).

### **Competitive Athletics**

#### *Football*

Sherbeck Field would continue to be used for football practice during weekdays in the afternoon and evening, for 2 hours. There would be approximately 80 practice sessions in the 16-week fall semester.

Saturday afternoon and occasional evening games<sup>2</sup> would be held at Sherbeck Field. Football games would last for three and a half to four hours. There would be approximately five regular and up to two playoff football games per year held at Sherbeck Field. There would be five away games held at other campuses. Football games would be scheduled from the last week of August to the last week of November. There would be a maximum of 1,600 attendees for a regular season football game and a maximum of 3,000 attendees for a playoff game (Saghieh 2017c). Parking would be provided at no charge for football game attendees.

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<sup>2</sup> Evening games would only be held in special circumstances during hot weather events or depending on the distance the opposing college has to travel. This is based on the Southern California Football Association bylaws. Evening games would not be regularly scheduled.

## **Initial Study for the Sherbeck Field Improvements Project**

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### ***Soccer***

Sherbeck Field would continue to be used for soccer practice, which would be held on weekdays in the morning for 2 hours. There are approximately 80 practice sessions in the 16-week fall semester.

Friday evening soccer games would be held at Sherbeck Field. Soccer games would typically last for 2 hours. There would be approximately three soccer games per year and a maximum of 200 attendees per game. Parking would be provided at no charge for soccer game attendees.

### ***Track and Field***

Sherbeck Field would continue to be used for track and field practice Mondays through Fridays during the fall and spring semester. Team practices would occur during the morning from 7:00 a.m. to 9:00 a.m. and during the afternoon from 12:00 p.m. to 2:00 p.m. There would be approximately 80 practice sessions in the 16-week fall semester.

Track and field events would continue to be held at Sherbeck Field. One Fullerton College track and field team event on a Friday would occur per year during the spring semester. This event would begin at 10 a.m. and end at 4:00 p.m. There would be approximately 100 attendees per game.

Orange Lutheran High School would continue to use the track in the spring and host up to four track meets per year, usually on a Tuesday, Wednesday or Thursday. Practice and meets would be held in the afternoon from 3:00 p.m. to 6 p.m. and would include approximately 150 attendees.

### **Rentals**

Fullerton College would continue to rent out Sherbeck Field to private schools and organizations to host athletic courses and practice. Specifically, Hope International University, Rosary High School, CDA Slammers, Anaheim Soccer, Seahorse Soccer, CAL South, Troy High School, Prep Football America Camp, and Orange Lutheran rent Sherbeck Field for athletic practice sessions. Additionally, Sherbeck Field would be rented out by the Buena Park Police Department three times per year for training purposes. Sherbeck Field would be rented out at various times on weekdays, Saturdays, and Sundays, as shown in Table 2. Rentals would be limited to the following timeframes: 6:00 a.m. to 9:00 a.m. Mondays through Fridays, 1:00 p.m. to 8:00 p.m. on Mondays through Fridays, and 8:00 a.m. to 8:00\*p.m. on Saturdays and Sundays.

### **Commencement Ceremony**

The annual commencement ceremony would continue to occur once per year in late May or early June at Sherbeck Field. Student check-in would occur from 8:00 a.m. to 9:30 a.m. Commencement would be held on Saturday, beginning at 10 a.m., and end in the afternoon. There would be a maximum of 7,500 students and guests attending the commencement ceremony.

## **Initial Study for the Sherbeck Field Improvements Project**

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Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Spring Semester							
6:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
7:00 AM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
8:00 AM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
9:00 AM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
10:00 AM	Conditioning for Athletes 7:00 AM –10:20 AM  Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes 7:00 AM –10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
11:00 AM	Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Body Conditioning and Fitness 11:45 AM–1:10 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout 10:10 AM– 11:35 AM  Body Conditioning and Fitness 10:10 AM–11:35 AM  Body Conditioning and Fitness 11:45 AM–1:10 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Body Conditioning and Fitness 10:10 AM–11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
12:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
1:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Body Conditioning and Fitness 11:45 AM–1:10 PM  Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
2:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Track 12:00 PM – 2:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
3:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:30 PM – 3:55 PM  Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
4:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
5:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 3:30 PM – 5:55 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
6:00 PM	Classes* Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
7:00 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
8:00 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
9:00 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	—	—	—
10:00 PM	—	—	—	—	—	—	—
Summer Semester							
6:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
7:00 AM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	—	—
8:00 AM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:00 AM – 8:50 AM  Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
9:00 AM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
10:00 AM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 7:30 AM – 10:20 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
11:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM



Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
12:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
1:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
2:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
3:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
5:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Strength 2:00 PM– 5:20 PM  Conditioning for Athletes – Strength 2:30 PM– 5:50 PM  Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
6:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 2:30 PM – 6:05 PM  Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	— Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
7:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Defense 2:30 PM – 7:05 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8:00 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	—	—	—
9:00 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	Classes Evening to 9:15 PM	—	—	—
10:00 PM	—	—	—	—	—	—	—
Fall Semester							
6:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM  Cross Country 6:30 AM – 8:25 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM  Cross Country 6:30 AM – 8:25 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM  Cross Country 6:30 AM – 8:25 AM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM  Cross Country 6:30 AM – 8:25 AM	—	—
7:00 AM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM		
8:00 AM	Cross Country 6:30 AM – 8:25 AM  Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Cross Country 6:30 AM – 8:25 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
9:00 AM	Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout; Conditioning for Athletes – Strength; Soccer 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Conditioning for Athletes – Circuit 8:35 AM – 10:00 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
10:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 800 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
11:00 AM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Boot Camp Workout 10:10 AM – 11:35 AM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
12:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
1:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM  <b>Football games 1:00–5:00 PM (August through October; Five Regular Football Games and Two Playoff Football Games per Year)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM
2:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM  <b>Football games 1:00–5:00 PM (August through October; Five Regular Football Games and Two Playoff Football Games per Year)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM
3:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football – Offense 1:25 PM – 3:20 PM  Football – Defense 1:30 PM – 3:20 PM  Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM  <b>Football games 1:00–5:00 PM (August through October; Five Regular Football Games and Two Playoff Football Games per Year)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM
4:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 0:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 0:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 0:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM  <b>Football games 1:00–5:00 PM (August through October; Five Regular Football Games and Two Playoff Football Games per Year)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM

Initial Study for the Sherbeck Field Improvements Project

Table 2  
Proposed Sherbeck Field Schedule and Programming

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
5:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Football 3:30 PM – 5:25 PM  Soccer or Other (Rental) 6:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
6:00 PM	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Soccer Games</b> <b>5:00 PM to 8:15 PM</b> <b>(Three Soccer Games per Year)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM	Soccer or Other (Rental) 8:00 AM – 8:00 PM
7:00 PM	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Soccer Games</b> <b>5:00 PM to 8:15 PM</b> <b>(Three Soccer Games per Year)</b>	<b>Football Games</b> <b>7:00 PM – 10:00 PM</b> <b>(two football games per year</b> <b>would occur in the evening)</b>	Soccer or Other (Rental) 8:00 AM – 8:00 PM
8:00 PM	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Soccer Games</b> <b>5:00 PM to 8:15 PM</b> <b>(Three Soccer Games per Year)</b>	<b>Football Games</b> <b>7:00 PM – 10:00 PM</b> <b>(two football games per year</b> <b>would occur in the evening)</b>	—
9:00 PM	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	<b>Classes</b> <b>Evening to 9:15 PM</b>	—	<b>Football Games</b> <b>7:00 PM – 10:00 PM</b> <b>(two football games per year</b> <b>would occur in the evening)</b>	—
10:00 PM	—	—	—	—	—	<b>Football Games</b> <b>7:00 PM – 10:00 PM</b> <b>(two football games per year</b> <b>would occur in the evening)</b>	—

\* New programming elements are provided in **bold** text.

## **Initial Study for the Sherbeck Field Improvements Project**

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### **3.5 Construction Activities**

It is anticipated that the Sherbeck Field improvements would occur over 6 months, beginning in spring 2019 and ending in fall 2019 (Saghieh 2017e). Construction phasing is anticipated as follows:

- Demolition
- Site preparation
- Grading
- Trenching
- Construction
- Paving
- Architectural coating

Demolition would involve the removal of existing pavement. Site preparation would involve the removal of demolition materials, excavation, and rough grading. Grading would consist of over-excavation within the bleacher areas, ramp areas, storage building area, and within proposed paved areas to a depth of 3 feet. During the grading phase, soils would be removed, replaced, and compacted. The trenching phase would involve the trenching of soil for placement of underground utilities, such as stormwater, domestic water, electrical lines, and data distribution. Construction would involve the installation of the press box, storage building, bleachers, sound system, and light stanchions. The paving phase would involve the pavement of asphalt surfaces, specifically for the bleacher area, storage building area, and walkways. Architectural coating would involve the application of athletic field striping to the track and field.

## **Initial Study for the Sherbeck Field Improvements Project**

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### **4 PUBLIC REVIEW PROCESS**

#### **Required Permits and Approvals**

The lead agency, the District, is responsible for CEQA clearance and site plan review. A public agency, other than the lead agency, that has discretionary approval over the project is known as a “responsible agency,” as defined by the CEQA Guidelines (14 CCR 15000 et seq.). The responsible agencies and their corresponding approvals for this project are listed below.

#### **State of California**

- Division of the State Architect (approval of construction drawings)

#### **Regional Agencies**

- Santa Ana Regional Water Quality Control Board (National Pollutant Discharge Elimination System Permit)
- Orange County Fire Authority (emergency access)
- South Coast Air Quality Management District (Permit to Construct)



## **Initial Study for the Sherbeck Field Improvements Project**

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### 5 SUMMARY OF FINDINGS

The District finds that the proposed project could have a significant adverse effect on the environment based on the results of the IS checklist, as described in Section 6. Potentially significant effects have been identified, and the District has decided to prepare an EIR to address these impacts, as described below:

1. **Aesthetics:** The proposed project could have a substantial effect by degrading the existing visual quality of a site or creating a new source of substantial light or glare. See Section 6.1, Aesthetics, for additional information.
2. **Agriculture and Forestry Resources:** The proposed project would not have an impact on agricultural resources. See Section 6.2, Agriculture and Forestry Resources, for additional information.
3. **Air Quality:** Short-term, construction-related impacts are anticipated to occur due to fugitive dust and emissions from vehicles. The operational phase of the proposed project could also result in a substantial increase in emissions. To accurately determine the proposed project's potential impacts on air quality, further analysis will be required. Impacts would be potentially significant. See Section 6.3, Air Quality, for additional information.
4. **Biological Resources:** The proposed project would not result in significant impacts to special-status wildlife or plant species or habitat on the project site, or interfere with the movement of a migratory wildlife species. Impacts would be less than significant. See Section 6.4, Biological Resources, for additional information.
5. **Cultural Resources:** The proposed project would not result in impacts to cultural, archaeological, and paleontological resources during ground-disturbing activities, or cause a substantial adverse change in the significance of a historical resource. Impacts would be less than significant. See Section 6.5, Cultural Resources, for additional information.
6. **Geology and Soils:** The proposed project would not expose people or structures to adverse risks associated with hazardous geologic or soil conditions. Impacts would be less than significant. See Section 6.6, Geology and Soils, for more information.
7. **Greenhouse Gas Emissions:** The proposed project would result in temporary construction-related emissions. During the operational phase, emissions would also increase due to higher energy usage. To accurately determine the proposed project's potential impacts on greenhouse gas emissions, further analysis will be required. Impacts would be potentially significant. See Section 6.7, Greenhouse Gas Emissions, for additional information.
8. **Hazards and Hazardous Materials:** The proposed project could introduce hazardous materials to people or the environment. See Section 6.8, Hazards and Hazardous Materials, for additional information.

## Initial Study for the Sherbeck Field Improvements Project

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9. **Hydrology and Water Quality:** Impacts to hydrology and water quality would be less than significant. See Section 6.9, Hydrology and Water Quality, for additional information.
10. **Land Use and Planning:** Impacts to land use and planning would be less than significant. See Section 6.10, Land Use and Planning, for more information.
11. **Mineral Resources:** The proposed project would not have an impact on mineral resources. See Section 6.11, Mineral Resources, for additional information.
12. **Noise:** The proposed project could expose persons to noise levels that exceed standards or to excessive groundborne vibration or groundborne noise levels, and result in a substantial permanent, temporary, or periodic increase in ambient noise levels during construction or operation. Noise impacts will be analyzed further in the EIR. Refer to Section 6.12, Noise, for more information.
13. **Population and Housing:** The proposed project would not divide an established community or displace people or housing. The proposed project would not induce substantial population growth. Population and housing impacts would be less than significant. See Section 6.13, Population and Housing, for more information.
14. **Public Services:** The proposed project could result in impacts to fire protection and police protection due to access issues and possible disturbances from project construction and operation. See Section 6.14, Public Services, for additional information.
15. **Recreation:** The proposed project could have an impact on recreational facilities. Impacts are potentially significant and will be analyzed further in the EIR. See Section 6.15, Recreation, for additional information.
16. **Transportation and Traffic:** During construction and operation of the proposed project, increases in traffic due to construction worker commutes, equipment and materials deliveries, and campus visitors may occur. This impact will be analyzed further in the EIR. See Section 6.16, Transportation and Traffic, for additional information.
17. **Tribal Cultural Resources:** See Section 6.17, Tribal Cultural Resources, for additional information.
18. **Utilities and Service Systems:** The proposed project would not have a significant impact on utilities and service systems since it would not require construction of new stormwater drainage facilities and water and wastewater treatment facilities and could require new or expanded water entitlements or resources. This impact will not be analyzed further in the EIR. See Section 6.18, Utilities and Service Systems, for additional information.
19. **Mandatory Findings of Significance:** The proposed project could result in significant impacts. See Section 6.19, Mandatory Findings of Significance, for more information.

## Initial Study for the Sherbeck Field Improvements Project

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### 6 INITIAL STUDY CHECKLIST

**1. Project title:**

Sherbeck Field Improvements Project

**2. Lead agency name and address:**

North Orange County Community College District  
1830A W. Romneya Drive  
Anaheim, California 92801

**3. Contact person and phone number:**

Richard Williams, District Director, Facilities Planning and Construction, 714.808.4893

**4. Project location:**

Fullerton College  
321 E. Chapman Avenue  
Fullerton, California 92832

**5. Project sponsor's name and address:**

North Orange County Community College District  
1830A W. Romneya Drive  
Anaheim, California 92801

**6. General plan designation:**

School

**7. Zoning:**

P-L Public Land

**8. Description of project. (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary):**

Refer to Section 3, Project Description.

## **Initial Study for the Sherbeck Field Improvements Project**

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**9. Surrounding land uses and setting (Briefly describe the project's surroundings):**

Fullerton College occupies an approximately 70-acre site in the City of Fullerton in northern Orange County. The City of Fullerton is surrounded by La Habra and Brea to the north, Placentia to the east, Anaheim to the south, and Buena Park to the west. Figure 1 shows the campus's regional location. Specifically, Fullerton College is bounded by residential development to the north, south, and east, and Fullerton Union High School to the west (see Figure 2).

**10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):**

- Division of the State Architect for approval of construction drawings
- Occupational Health and Safety Administration to be notified of the proposed construction, renovation, and demolition plans
- Santa Ana Regional Water Quality Control Board for the issuance of a National Pollutant Discharge Elimination System Permit
- Orange County Fire Authority for review of project design regarding emergency access

**11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?**

**Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.**

Yes, one tribe requested consultation. Consultation is ongoing.

## Initial Study for the Sherbeck Field Improvements Project

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### ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact,” as indicated by the checklist on the following pages.

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Aesthetics                         | <input type="checkbox"/> Agriculture and Forestry Resources         | <input checked="" type="checkbox"/> Air Quality        |
| <input type="checkbox"/> Biological Resources                          | <input type="checkbox"/> Cultural Resources                         | <input type="checkbox"/> Geology and Soils             |
| <input checked="" type="checkbox"/> Greenhouse Gas Emissions           | <input checked="" type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Hydrology and Water Quality   |
| <input type="checkbox"/> Land Use and Planning                         | <input type="checkbox"/> Mineral Resources                          | <input checked="" type="checkbox"/> Noise              |
| <input type="checkbox"/> Population and Housing                        | <input checked="" type="checkbox"/> Public Services                 | <input checked="" type="checkbox"/> Recreation         |
| <input checked="" type="checkbox"/> Transportation and Traffic         | <input checked="" type="checkbox"/> Tribal Cultural Resources       | <input type="checkbox"/> Utilities and Service Systems |
| <input checked="" type="checkbox"/> Mandatory Findings of Significance |   |  |

## Initial Study for the Sherbeck Field Improvements Project

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### **DETERMINATION:** (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

  
\_\_\_\_\_  
Signature

4/3/18  
\_\_\_\_\_  
Date

## Initial Study for the Sherbeck Field Improvements Project

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### EVALUATION OF ENVIRONMENTAL IMPACTS:

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an Environmental Impact Report (EIR) is required.
4. “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a. Earlier Analysis Used. Identify and state where they are available for review.
  - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c. Mitigation Measures. For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated



## Initial Study for the Sherbeck Field Improvements Project

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or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
  - a. The significance criteria or threshold, if any, used to evaluate each question; and
  - b. The mitigation measure identified, if any, to reduce the impact to less than significance.

## Initial Study for the Sherbeck Field Improvements Project

### 6.1 Aesthetics

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. AESTHETICS – Would the project:</b>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**a) *Would the project have a substantial adverse effect on a scenic vista?***

***Less-Than-Significant Impact.*** The proposed project would involve improvements to the existing Sherbeck Field, including installation of permanent bleachers, lighting stanchions, a sound system, and construction of a storage building and press box. Construction activities could have a temporary impact on views due to the presence and staging of equipment. The proposed bleachers could obstruct views of the surrounding area. However, the area surrounding the project site is characterized by public, residential, religious institution, and commercial uses. The City of Fullerton General Plan does not identify any scenic areas or vistas in the vicinity of the campus. There is a designated scenic corridor at the intersection of Brea Boulevard and Harbor Boulevard, approximately 0.4 miles northwest of the project site (City of Fullerton 2012a); however, Fullerton College is located in an area where the presence of existing development limits the availability of views to this scenic corridor.

No nature preserves are located within the City, but several parks are located throughout the City. The closest parks are Hillcrest Park and Byerrum Park, which are both located approximately 0.3 miles away; however, Fullerton College is located in an area where the presence of existing development limits the availability of views to nearby parks. As discussed, there are no scenic vistas visible to or from the project site. Therefore, impacts would be less than significant. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- b) *Would the project substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*

**Less-Than-Significant Impact.** The proposed project would involve installation of permanent bleachers, lighting stanchions, a sound system, a storage building, and a press box, which could obstruct views of the surrounding area. Construction activities could have a temporary impact on views due to the presence and staging of equipment. According to the California Department of Transportation (Caltrans 2017), the nearest eligible scenic roadway is the stretch of State Route (SR) 57 from SR-90 to SR-60, which is approximately 1.9 miles from the project site at its closest point. This highway is not an officially designated scenic roadway, but it is considered eligible. The nearest officially designated state scenic highway is SR-91 east of SR-55, which is approximately 5.6 miles from the project site at its closest point (Caltrans 2017). Additionally, there are no County of Orange designated scenic highways within the vicinity of the campus (County of Orange 2005). The proposed project would not damage scenic resources within a state scenic highway, and no further analysis is required. This topic will not be analyzed in the EIR.

- c) *Would the project substantially degrade the existing visual character or quality of the site and its surroundings?*

**Potentially Significant Impact.** The proposed project would involve improvements to the existing Sherbeck Field, such as permanent bleachers and lighting stanchions, which could substantially impact the visual character and quality of the site and its surroundings, particularly for residents directly adjacent to the project site across North Berkley Avenue. Impacts are potentially significant and will be examined in the EIR.

- d) *Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

**Potentially Significant Impact.** The proposed project would include installation of lighting stanchions and house lighting, which would introduce a new source of nighttime light to the project site. Other project elements, including the press box and storage building, could also introduce new sources of nighttime light. The bleachers could introduce a new source of glare to the project site and the surrounding areas. Press box and storage building windows may also introduce glare. Further analysis is necessary to understand if light and glare would adversely affect day or nighttime views in the area. Impacts are potentially significant and will be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>II. AGRICULTURE AND FORESTRY RESOURCES</b> – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a) ***Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?***

**No Impact.** The proposed project would consist of improvements occurring entirely within the existing Sherbeck Field. The proposed project would not convert farmland to nonagricultural use. The entire project site and project vicinity are designated as urban and built-up land, pursuant to the Farmland Mapping and Monitoring Program of the California Natural Resources Agency (DOC 2017). A parcel of Prime Farmland, located in Placentia, is located approximately 4.7 miles east of the Fullerton College campus and

## Initial Study for the Sherbeck Field Improvements Project

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appears to contain a dirt lot on the entirety of the site. Additionally, a parcel of land designated as a mixture of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland is located approximately 4.8 mile northwest of the campus in Yorba Linda (DOC 2017). The site appears to contain areas of active farming. The proposed project would not occur within these isolated farmland locations, and would not result in the conversion of this land to nonagricultural use. Therefore, no impact would occur, and no further analysis is required in the EIR.

**b) *Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?***

**No Impact.** The Williamson Act, also known as the California Land Conversion Act of 1969 (California Government Code Section 51200 et seq.), preserves agricultural and open space lands from the conversion to urban land uses by establishing a contract between local governments and private landowners to voluntarily restrict their land holdings to agricultural or open space use. The project site is not located on any lands with Williamson Act contracts.

The Fullerton College campus, including Sherbeck Field, is designated as public land (P-L) in the City of Fullerton zoning map (City of Fullerton 2017). The area west of the project site consist of public land (P-L), two-family residential preservation (R-2P), limited-density multifamily residential (R-3), limited-density multiresidential preservation (R-3P), and central business district (C-3). The area to the north of the project site consists of single-family residential (R-1), single-family residential preservation (R-1P), and limited-density multifamily residential (R-3). The area east of the project site consists almost entirely of single-family residential (R-1), with some office professional land (O-P). The area south of the project site consists of office professional land (O-P), public land (P-L) and two-family residential preservation (R-2P) (City of Fullerton 2017). None of these zones allows agricultural uses. Additionally, according to the City of Fullerton General Plan EIR, less than 1% (approximately 5.3 acres) of the City is devoted to agricultural uses (City of Fullerton 2012b). Due to the developed nature of the site and surrounding land, the proposed project would not conflict with existing zoning for agricultural use. Therefore, there would be no conflict with agriculturally zoned land, and no further analysis is required in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

- c) *Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*

**No Impact.** The project site is designated as public land. The surrounding land consists of commercial and residential uses (City of Fullerton 2017). All construction would take place within the existing Sherbeck Field on the Fullerton College campus, and the proposed project would not conflict with existing zoning or cause rezoning of any forest or timberland, since none of those land types are located within the vicinity of the project site. No impact would occur, and no further analysis is required in the EIR.

- d) *Would the project result in the loss of forest land or conversion of forest land to non-forest use?*

**No Impact.** The proposed project is located in an urban, developed area and is not located within or in the vicinity of forest land. The closest forests are located in Chino Hills State Park and Cleveland National Forest, approximately 5.5 miles northeast and 13.8 miles southeast, respectively, of the project site (USFS 2017). The proposed project would not contribute to the loss of forest land, and no impact would occur. No further analysis is required in the EIR.

- e) *Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*

**No Impact.** No farmland or forest land exists within the vicinity of the project site, as described in Sections 6.2(a)–(d). Therefore, no farmland or forests would be converted for nonagricultural or non-forest use due to the proposed project. No impact on farmland or forest land would occur due to the proposed project; therefore, no further analysis is required in the EIR.

### 6.3 Air Quality

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. <b>AIR QUALITY</b> – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) ***Would the project conflict with or obstruct implementation of the applicable air quality plan?***

***Potentially Significant Impact.*** The City of Fullerton is within the jurisdiction of the South Coast Air Quality Management District. The Air Quality Management Plan prepared by South Coast Air Quality Management District incorporates planning projections to devise a plan to meet federal and state air quality requirements (SCAQMD 2017). The proposed project would increase air pollutants in the short term due to construction activities, and in the long term due to an increase in visitors to the project site for Fullerton College football games, expanded classes and rentals, and expanded hours of operation. The increase in visitors would likely result in an increase in mobile criteria air pollutant emissions into the project area, and could potentially obstruct implementation of the Air Quality Management Plan. These issues are potentially significant and will be analyzed in the EIR.

- b) ***Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?***

***Potentially Significant Impact.*** The proposed project could violate an air quality standard or contribute substantially to an air quality violation. Construction of the proposed project would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, dust emissions, and combustion pollutants from on-site construction equipment, construction worker vehicles, vendor/delivery trucks, and off-site haul trucks. Oxides of nitrogen, carbon monoxide, particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM<sub>10</sub>), particulate matter with an aerodynamic diameter

## Initial Study for the Sherbeck Field Improvements Project

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equal to or less than 2.5 microns (PM<sub>2.5</sub>), and sulfur dioxide emissions would primarily result from the use of construction equipment and motor vehicles. Volatile organic compound emissions would result from architectural coating. Construction emissions can vary substantially from day to day depending on the level of activity; the specific type of operation; and, for dust, the prevailing weather conditions.

Long-term air pollution could result from vehicular emissions and proposed project operations. An increase in visitors and expanded hours of operation could contribute to additional criteria air pollutant emissions. This issue is a potentially significant impact and will be analyzed further in the EIR.

- c) ***Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?***

***Potentially Significant Impact.*** The proposed project could result in a cumulatively considerable net increase of criteria pollutants under nonattainment according to a federal or state standard. Criteria pollutants under nonattainment in the South Coast Air Basin include ozone and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) (SCAQMD 2017). Ozone formation resulting from visitor and student vehicle emissions could contribute to long-term air quality impacts. Particulate matter emissions resulting from construction activities could contribute to temporary impacts. Further investigation is required to determine the proposed project's potential to result in a considerable net increase of these criteria pollutants. These issues are potentially significant and will be analyzed further in the EIR.

- d) ***Would the project expose sensitive receptors to substantial pollutant concentrations?***

***Potentially Significant Impact.*** Sensitive receptors include population groups that are susceptible to the effects of air pollutants. Sensitive receptors include the elderly, children, those with serious medical conditions, and any other group considered sensitive to the harmful effects of air pollutants. Sensitive receptors located within the vicinity of the campus include nearby residences, Raymond Elementary School, and Fullerton Union High School. Further analysis is required to determine the amount of criteria air pollutant emissions that would result from proposed project construction and operations, and whether this would be considered substantial. This issue is potentially significant and will be analyzed further in the EIR.



## Initial Study for the Sherbeck Field Improvements Project

e) *Would the project create objectionable odors affecting a substantial number of people?*

**Potentially Significant Impact.** It is possible that odors could be released during construction activities and while the proposed project is in operation. Construction activities include paving and architectural coating, which could result in the temporary release of objectionable odors. While in operation, odors associated with waste and chemicals used for cleaning and facility maintenance could be released from the project site. This issue is potentially significant and will be analyzed further in the EIR.

### 6.4 Biological Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. BIOLOGICAL RESOURCES – Would the project:</b>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

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The following analysis is based on a general biological investigation conducted by Dudek Arborist/Biologist Ryan Gilmore performed on October 11, 2016 (Appendix B). The general survey included the Fullerton College campus plus a 200-foot buffer totaling approximately 123.67 acres (study area). The purpose of the general survey was to identify vegetation communities and land covers, and identify potential habitat for any threatened, endangered, or otherwise special-status species that may occur within the study area. No focused, protocol-level surveys for plants or wildlife were conducted.

- a) *Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

***Less-Than-Significant Impact.*** The presence of protected or regulated vegetation communities, plant species, and wildlife species occurring or potentially occurring within the study area was based on a literature review and evaluation of the habitat found within the study area. The review included the California Natural Diversity Database, U.S. Fish and Wildlife Service's environmental online system, and the California Native Plant Society's Inventory of Rare and Endangered Plants. During the field survey, a general inventory of plant and wildlife species were detected by sight, calls, tracks, scat, or other signs, and the potential for special-status species to occur within the study area was determined. No special-status species were observed within the study area during the site visit (Appendix B).

### **Plant Species**

The project site does not support any special-status plant species. Based on the species ranges, the types of land covers (i.e., developed, ornamental, ruderal, and transportation), and the soils present on site, there is no potential for special-status plant species to occur. A total of 39 special-status plant species were reported in the California Natural Diversity Database, U.S. Fish and Wildlife Service's environmental online system, and California Native Plant Society's inventory as occurring in the vicinity of the study area. However, no special-status plant species were observed within the study area during the site visit (Appendix B). Therefore, based on the lack of suitable habitat and the developed nature of the study area, there would be no direct or indirect impacts associated with special-status plant species.

## Initial Study for the Sherbeck Field Improvements Project

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### Wildlife Species

The project site does not support any special-status wildlife species. Based on the species ranges, the types of land covers (i.e., developed, ornamental, ruderal, and transportation), and the soils present on site, there is no potential for special-status wildlife species to occur. A total of 50 special-status wildlife species were reported in the California Natural Diversity Database and U.S. Fish and Wildlife Service's environmental online system as occurring in the vicinity of the study area. However, no special-status wildlife species were observed within the study area during the site visit (Appendix B). Therefore, based on the lack of suitable habitat and the developed nature of the study area, there would be no direct or indirect impacts to special-status wildlife species.

### Raptor Nesting and Foraging

Because the study area is composed of ornamental landscaping that supports mature trees, there are limited nesting habitats for raptors. Foraging opportunities may occur outside the project site within the ruderal grassland areas. No raptor species were observed within the study area during the site visit (Appendix B).

Raptors that breed in wooded areas that may occur within the study area include American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginianus*). Other species that may over-winter or visit the study area include ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and sharp-shinned hawk (*Accipiter striatus*) (Appendix B).

A limited number of wildlife species was observed or detected during the general field survey of the study area, including six bird species. Bird species included American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). No raptors or active nests were observed during the site visit (Appendix B).

If trees were to be removed during proposed project activities, this could have a substantial adverse effect on these special-status avian species because these trees could potentially provide nesting opportunities for bird and raptor species protected under the California Fish and Game Code and the Migratory Bird Treaty Act of 1918.

Impacts to nesting bird and raptor species would be potentially significant if implementation of the proposed project would require removal or substantial trimming of healthy mature trees during the bird nesting season. Although the proposed project would not involve the

## Initial Study for the Sherbeck Field Improvements Project

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removal or substantial trimming of trees, the proposed project would be required to comply with the Migratory Bird Treaty Act to reduce impacts to nesting bird habitat.

Upon compliance with the Migratory Bird Treaty Act, impacts to candidate, sensitive, or special-status species would be less than significant. This topic will not be analyzed in the EIR.

- b) *Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?***

**No Impact.** According to the general reconnaissance biological survey (Appendix B), the Sherbeck Field site consists of developed land, ornamental plantings, and transportation uses. These are not natural vegetation communities considered sensitive by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service. The project site is not located in riparian habitat or a sensitive natural community, and the project would not have an adverse effect on these habitats. Therefore, no impacts would occur and no further analysis is required. This topic will not be analyzed in the EIR.

- c) *Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

**No Impact.** The project site does not support any aquatic resources regulated by the U.S. Army Corps of Engineers or the California Department of Fish and Wildlife as jurisdictional wetlands, waters of the United States, or waters of the state. No drainages were observed within the study area. The closest aquatic resource is Brea Creek (concrete box channel or wash) located 0.12 miles to the west of Fullerton College at its closest approach (Appendix B). Therefore, the proposed project would have no adverse effect on federally protected wetlands. This topic will not be analyzed in the EIR.

- d) *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

**Less-Than-Significant Impact.** Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal.

## Initial Study for the Sherbeck Field Improvements Project

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No wildlife corridors or habitat linkages were identified near the study area (Appendix B). Given the extent of existing development north, east, south, and west of the project site and the Fullerton College campus' location between several busy vehicular thoroughfares, the study area is expected to support limited wildlife movement, and lacks intact connectivity to other major habitat reserve areas. Therefore, the proposed project would have a less-than-significant impact on the migratory movement of any wildlife species. No impacts would occur, and this issue will not be analyzed in the EIR.

- e) ***Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?***

**No Impact.** The City of Fullerton Municipal Code Chapter 9.06, Community Forestry, states that no person shall injure, prune, or remove any public tree growing within City public rights-of-way (parkways, parks, and areas around public buildings) without a permit from the Director of Maintenance Services. Furthermore, it is against the code to prune or remove a landmark tree. Landmark trees are defined as any tree found to be of high value because of its species, size, age, or historic associations, and has been designated by the City Council. Landmark trees are designated by the City and identified on maps filed in the Planning Department.

Dudek contacted the City on October 10, 2016, to determine the potential locations of landmark trees within the study area. The City stated that there are currently no official landmark trees as designated by the past or present City Council decree (Appendix B). Therefore, there are no landmark trees within the study area or project site. Therefore, the proposed project would not conflict with local policies or ordinances protecting biological resources. No impacts would occur, and this issue will not be analyzed in the EIR.

- f) ***Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?***

**No Impact.** Exhibit 25 of the City of Fullerton General Plan does not identify habitat conservation areas within the vicinity of the project site (City of Fullerton 2012c). The project site is not identified on a regional or state conservation plan. Consequently, the project would not conflict with provisions of an adopted habitat conservation plan or natural community conservation plan. There would be no impact and this issue will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.5 Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES</b> – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The following analysis is based on the Cultural Resources Report prepared by Dudek for the Fullerton College campus, dated August 2017 (Appendix C).

**a) *Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?***

**No Impact.** As part of the Cultural Resources Report (Appendix C), documents and photos available online through the Fullerton College library, available reports and historic documents on file with Fullerton College or the District, local newspapers, historic aerials, and other sources of information regarding the history and development of the campus were reviewed. In addition, a California Historical Resources Information System (CHRIS) records search of the Fullerton College campus and a 0.5-mile radius at the South Central Coastal Information Center occurred on December 14, 2016. The CHRIS search included a review of the National Register of Historic Places, the California Register of Historical Resources (CRHR), the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list.

Dudek Architectural Historians Samantha Murray, MA, RPA; Sarah Corder, MFA; and Kara R. Dotter, MS, conducted a pedestrian survey of the Fullerton College campus on February 20, 2017. All buildings and structures that were constructed prior to 1972 were photographed, researched, and evaluated in consideration of CRHR designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA. The 45-year rule was established by the Office of Historic

## Initial Study for the Sherbeck Field Improvements Project

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Preservation in recognition of the fact that there is often a lag between the point at which resources are identified and the date that planning decisions are made on projects. The survey entailed walking all portions of the Fullerton College campus and documenting each building with notes and photographs, specifically noting their character-defining features, spatial relationships, and observed alterations (Appendix C).

As described in Section 3, Project Description, the project site was originally constructed from 1956 to 1957. The field was renamed in 1992 after Coach Hal Sherbeck (Fullerton College Centennial 2017). The field house, existing turf, and rubberized track were constructed in 2010 (California Community Colleges 2016). The project site consists of a turf football field, a rubberized track, a two-story field house, and a scoreboard. The proposed project would involve construction and installation of bleachers, lighting, a sound system, press box, and a storage building north of the field house.

Under CEQA, a project may have a significant effect on the environment if it may cause “a substantial adverse change in the significance of an historical resource” (PRC Section 21084.1; 14 CCR 15064.5[b]). If a site is either listed or eligible for listing in the CRHR, or included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1[q]), it is a “historical resource” and is presumed to be historically or culturally significant for purposes of CEQA (PRC Section 21084.1; 14 CCR 15064.5[a]). A “substantial adverse change in the significance of an historical resource” reflecting a significant effect under CEQA means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (14 CCR 15064.5[b][1]; PRC Section 5020.1[q]).

As a result of the significance evaluations for the National Register of Historic Places, CRHR, and the City of Fullerton historical landmark eligibility criteria and integrity, the historical resources identified on the Fullerton College campus included three historic districts: the Fullerton Junior College Campus Historic District, the Mid-Century Modern Campus Expansion Historic District, and the Wilshire Junior High School Historic District. In addition, the Music Building was identified as being potentially eligible for individual listing at the local level (Appendix C).

The Cultural Resources Report did not identify Sherbeck Field or any of its components as historical resources under CEQA (Appendix C). In addition, the proposed project would not involve demolition, relocation, or alteration of any structures. Therefore, no impacts to historical resources would occur, and no analysis is required in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- b) *Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

***Less-Than-Significant Impact.*** The CHRIS records search at the South Central Coastal Information Center indicated that 41 cultural resources were previously recorded, and 22 cultural resources studies have been conducted within a 0.5-mile search radius of the Fullerton College campus. Two of the cultural resources overlap the Fullerton College campus: Fullerton Junior College at 321 East Chapman Avenue and Wilshire Junior High School at 315 East Wilshire Avenue. There is one archaeological resource recorded within 0.5 miles of the project site: the Fullerton Transit Historical Reuse deposit (Appendix C).

No archaeological resources were identified on or adjacent to the project site as a result of the CHRIS records search or the Native American coordination efforts described in Appendix C. However, it is always possible that intact archaeological deposits are present at subsurface levels and could be uncovered during ground-disturbing activities. Therefore, in the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find would be required to immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether additional study is warranted, as required by California Public Resources Code Section 21082. Depending on the significance of the find under CEQA, the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery, may be warranted.

If any unanticipated archaeological resources are discovered during project construction, they would be handled in accordance with all applicable laws regulating archaeological resources; therefore, impacts would be less than significant. Therefore, no further analysis is required, and this topic will not be analyzed in the EIR.

- c) *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

***Less-Than-Significant Impact.*** According to the Los Angeles County History Museum records search results (McLeod 2016), there are no documented fossil localities within a 1-mile radius of the Fullerton College campus. Geological mapping and geotechnical investigations indicate that the site is underlain by Quaternary alluvium, including older, Pleistocene-age deposits anticipated at depth, and the Pleistocene La Habra Formation at



## Initial Study for the Sherbeck Field Improvements Project

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the surface in the northwestern Fullerton College Campus. Older Pleistocene alluvium and the La Habra Formation have produced numerous plant and animal fossils in the region; therefore, these geological units should be considered to have a high potential to contain significant paleontological resources (McLeod 2016). However, Quaternary alluvium is too young to yield fossils. As described in Section 3.5, Construction Activities, proposed excavation would reach a depth of up to 3 feet. Because only Quaternary alluvium is present at a depth of 3 feet at the project site, project construction is not anticipated to encounter paleontological resources. Therefore, impacts associated with paleontological resources are less than significant. No further analysis is required, and this topic will not be analyzed in the EIR.

**d) *Would the project disturb any human remains, including those interred outside of dedicated cemeteries?***

***Less-Than-Significant Impact.*** There is no evidence of human remains on the project site, and the potential for the inadvertent discovery of human remains on the project site is very low because there is no evidence of any historical camps or human settlement on the site (Appendix C). Additionally, existing regulations through California Health and Safety Code Section 7050.5 et seq. state that if human remains are discovered during project construction, no further disturbance can occur until the Orange County Coroner has made the necessary findings as to its origin. Further, pursuant to PRC Section 5097.98(b), remains must be left in place and free from disturbance until a final decision as to the treatment and disposition of the remains has been made. If the County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within a reasonable time. Subsequently, the Native American Heritage Commission will identify the most likely descendant. The most likely descendant will then make recommendations and engage in consultations concerning the treatment of the remains, as provided in PRC Section 5097.98. Given the very low potential for human remains on the project site and required compliance with existing regulations pertaining to the discovery of human remains, the proposed project would not result in adverse impacts to human remains. The impact would be less than significant, and this topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.6 Geology and Soils

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS</b> – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) *Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

**Less-Than-Significant Impact.** The proposed project site is located in the La Habra Quadrangle. No active fault lies directly underneath the project site;

## Initial Study for the Sherbeck Field Improvements Project

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however, the Whittier Fault Zone is located 4.5 miles northeast of the proposed project site (DOC 2010). The nearest fault lines are the Norwalk Fault, located approximately 1.5 miles to the southwest; the faults in West Coyote Hills, located approximately 2.5 miles to the northwest; and the El Modeno and Peralta Hills faults, located approximately 4.0 miles southeast of the project site (DOC 2010). The Los Alamitos Fault, at its closest point, is 10.75 miles southwest of the project site in the City of Los Alamitos. Farther away are the Newport–Inglewood Fault Zone and Chino Fault (DOC 2010). Due to the proximity to fault zones, the proposed project site could be vulnerable to the effects of fault rupture, but the potential for direct surface ground rupture is considered very unlikely (Geotechnical Solutions Inc. 2018). In addition, the proposed project would occur entirely within the existing Sherbeck Field and would involve construction of only small structures and improvements, including bleachers, lighting stanchions, a press box, and a storage building. All improvements would be designed, fabricated, and constructed in accordance with applicable seismic standards and regulations, including the Division of the State Architect requirements and the California Building Standards Code. These codes impose design standards and requirements that seek to minimize the damage associated with seismic events. With adherence to applicable standards and regulations, the proposed project would not expose people or structures to substantial adverse risks associated with fault rupture. The impact would be less than significant and no further analysis is required in the EIR.

*ii) Strong seismic ground shaking?*

***Less-Than-Significant Impact.*** Given the project site’s proximity to the Norwalk Fault, the faults in West Coyote Hills, and the El Modeno and Peralta Hills faults, located 1.5 miles, 2.5 miles, and 4.0 miles from the project site, respectively (DOC 2010), the site would be vulnerable to the adverse effects of strong seismic ground shaking. However, the proposed project would involve construction of only small structures and improvements, including bleachers, lighting stanchions, a press box, and a storage building. All improvements would be designed, fabricated, and constructed in accordance with applicable seismic standards and regulations, including the Division of the State Architect requirements and the California Building Standards Code. These codes impose design standards and requirements that seek to minimize the damage associated with seismic events. With adherence to applicable standards and regulations, the proposed project would not expose people or structures to substantial adverse risks associated with

## Initial Study for the Sherbeck Field Improvements Project

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seismic ground shaking. The impact would be less than significant and no further analysis is required in the EIR.

**iii) *Seismic-related ground failure, including liquefaction?***

***Less-Than-Significant Impact.*** Liquefaction occurs when partially saturated soil loses its effective stress and enters a liquid state, which can result in the soil's inability to support structures above. Liquefaction can be induced by ground-shaking events and is dependent on soil saturation conditions. The proposed project site is within the La Habra 7.5-minute quadrangle and is not within a liquefaction zone (CGS 1998). The project site is also not identified as susceptible to liquefaction according to Exhibit 27 of the City of Fullerton General Plan Natural Environment Element (City of Fullerton 2012c) and has been identified as outside a potential liquefaction zone (Geotechnical Solutions Inc. 2018). Additionally, project design and construction would conform to the Division of the State Architect requirements and the California Building Standards Code, which would abate any effects of unanticipated seismic-related ground failure and liquefaction. As such, the proposed project would not expose people or structures to substantial adverse risks associated with seismic-related ground failure or liquefaction. The impact would be less than significant and no further analysis is required in the EIR.

**iv) *Landslides?***

***Less-Than-Significant Impact.*** Landslides often occur during or after strong earthquakes. The proposed project site is within the La Habra 7.5-minute quadrangle and is not within an earthquake-induced landslide zone (CGS 1998; Geotechnical Solutions Inc. 2018). The project site is also not identified as susceptible to landslides according to Exhibit 27 of the City of Fullerton General Plan Natural Environment Element (City of Fullerton 2012c). Additionally, the project site is relatively flat. Due to these site conditions, the proposed project would not expose people or structures to substantial adverse risks associated with landslides. The impact would be less than significant and no further analysis is required in the EIR.

**b) *Would the project result in substantial soil erosion or the loss of topsoil?***

***Less-Than-Significant Impact.*** As described in Section 3.5, Construction Activities, grading would consist of over-excavation within the bleacher areas, ramp areas, storage building area, and within proposed paved areas to a depth of 3 feet. Therefore, the

## Initial Study for the Sherbeck Field Improvements Project

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proposed project would involve minimal excavation and grading activities that would expose soils. Additionally, the proposed project would comply with the measures outlined in the District's Storm Water Management Plan (SWMP) (Ninyo and Moore 2015). The SWMP requires that the construction management team or contractor inspect the project site on a weekly basis to prevent erosion and stormwater runoff from occurring. Additionally, project construction would be subject to erosion best management practices (BMPs). The impact would be less than significant and no further analysis is required in the EIR.

- c) ***Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?***

***Less-Than-Significant Impact.*** The proposed project site is located in Southern California, which is an area that is generally seismically active. The project site's proximity to various faults, as described in Sections 6.6 a(i and ii), means that there is an unavoidable potential for the geologic unit to become unstable. However, as described in Section 6.6 a(i), the proposed project site is not underlain by any known earthquake faults. The proposed project site is also not within an area susceptible either to liquefaction or landslides, as described in Sections 6.6 a(iii) and 6.6 a(iv). Additionally, the scope of project improvements is relatively limited and would involve construction of only small structures and improvements, including bleachers, lighting stanchions, a press box, and a storage building, which do not have the potential to cause the geologic unit to become unstable. The proposed project would be designed, fabricated, and constructed in accordance with applicable seismic standards and regulations, including the Division of the State Architect requirements and the California Building Standards Code, which would minimize damage if the geologic unit becomes unstable. Therefore, the proposed project would not result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. The impact would be less than significant and no further analysis is required in the EIR.

- d) ***Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?***

***Less-Than-Significant Impact.*** The proposed project site is located on Mocho loam, San Emigdio loam, and Xerorthents loamy cut and fill areas, which have expansive properties (USDA 2017). Tests done on site indicate that the underlying soil is classified as very low expansive soil (Geotechnical Solutions Inc. 2018). However, the scope of project improvements is relatively limited and would involve construction of only small structures and improvements, including bleachers, lighting stanchions, a press box, and a

## Initial Study for the Sherbeck Field Improvements Project

storage building within the existing Sherbeck Field. Additionally, the proposed project would comply with the Uniform Building Code of 1994 (now the International Building Code), which would minimize risks to life and property in relation to expanding soils. Therefore, the proposed project would not create a substantial risk to life or property as a result of being located on expansive soils. The impact would be less than significant and no further analysis is required in the EIR.

- e) *Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?*

**No Impact.** The proposed project would not include septic tanks or alternative wastewater disposal systems; therefore, no impact would occur. This issue will not be analyzed further in the EIR.

### 6.7 Greenhouse Gas Emissions

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. GREENHOUSE GAS EMISSIONS</b> – Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

**Potentially Significant Impact.** Global climate change is a cumulative impact; a project has a potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases (GHGs). Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no noncumulative GHG emissions impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the California Natural Resources Agency, which noted in its public notice for the proposed CEQA amendments that the evidence indicates that, in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009a). Similarly, the Final Statement of Reasons for Regulatory Action for amendments to the CEQA Guidelines

## Initial Study for the Sherbeck Field Improvements Project

confirms that an EIR or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable (CNRA 2009b).

The proposed project would result in the emission of GHGs. Temporary GHG impacts would result from the operation of construction vehicles and equipment. Operation of the improved Sherbeck Field would increase energy demand and increase visitor and student trips, and would, therefore, result in the ongoing emission of GHGs. Further analysis is required to determine the estimated project-generated GHG emissions and their impact on global climate. Impacts are potentially significant and will be addressed in the EIR.

**b) *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

**Potentially Significant Impact.** There are several federal and state regulatory measures aimed at identifying and reducing GHG emissions, most of which focus on area-source emissions (e.g., energy use) and changes to the vehicle fleet (hybrid, electric, and more fuel-efficient vehicles). The Global Warming Solutions Act (Assembly Bill [AB] 32) prepared a scoping plan and its first update, which established regulations to reduce California GHG emission levels to 431 million metric tons of carbon dioxide equivalent per year (CARB 2014). The proposed project would comply with regulations established by AB 32. However, further investigation is required to determine the estimated project-generated GHG emissions and their relationship to AB 32 and other applicable plans and policies. Impacts are potentially significant and will be addressed in the EIR.

## 6.8 Hazards and Hazardous Materials

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**a) *Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?***

***Less-Than-Significant Impact.*** Hazardous substances and wastes could be transported to and stored, used, and generated on the project site during construction. These may include fuels for machinery and vehicles, motor oil, cleaning solvents, paints, and other substances and wastes typical of a construction site. However, these materials would be transported, used, and disposed of in accordance with all federal, state, and local laws regulating the management and use of hazardous materials. All waste would be removed and transported to a permitted waste facility for treatment, storage, or disposal. Use of these materials for their intended purposes during construction activities would not pose a significant risk to the public or the environment.

The proposed project would involve very little transport, storage, use, or disposal of hazardous materials, and would be associated with janitorial, maintenance, and repair activities (e.g., commercial cleaners, lubricants, or paints and household cleaning supplies). Use of these materials would be limited, and transport, storage, use, and disposal of these materials would be subject to all federal, state, and local laws regulating the management and use of hazardous materials. Because hazardous materials/chemicals



## Initial Study for the Sherbeck Field Improvements Project

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used during operations would be transported, used, and disposed of in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, impacts would be less than significant. Therefore, no further analysis is required, and this topic will not be analyzed in the EIR.

- b) *Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

**Less-Than-Significant Impact.** As discussed under Section 6.8(a), hazardous substances and wastes could be stored and used on the proposed project site during construction. Accidental spills, leaks, fires, explosions, or pressure releases involving hazardous materials represent a potential threat to human health and the environment if not properly treated. The most likely spills or releases of hazardous materials during construction would involve petroleum products, such as diesel fuel, oils, and lubricants. All storage, handling, and disposal of these materials are regulated by the Department of Toxic Substances Control (DTSC), the U.S. Environmental Protection Agency, the Occupational Safety and Health Administration, and the City of Fullerton and Orange County Fire Departments.

The proposed project would involve very little use of hazardous materials, which would be associated with janitorial, maintenance, and repair activities (e.g., commercial cleaners, lubricants, or paints and household cleaning supplies). Use of these materials would be subject to all federal, state, and local laws regulating the management and use of hazardous materials. Because hazardous materials/chemicals used during operations would be in accordance with all federal, state, and local laws regulating the management and use of hazardous materials, impacts would be less than significant. No further analysis is required and this topic will not be analyzed in the EIR.

- c) *Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

**Less-Than-Significant Impact.** The proposed project site is within 0.25 miles of Fullerton Union High School and Raymond Elementary School. As discussed under Sections 6.8 (a) and (b), with adherence to applicable laws, regulations, and standards, the proposed project would not create a significant risk to the public or the environment related to the use or upset of hazardous materials. As such, it would not create a risk to nearby schools. Impacts would be less than significant and no further analysis is required. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- d) *Would the project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

**Potentially Significant Impact.** CEQA requires review of Section 65962.5 of the California Government Code, also known as the “Cortese List,” to identify whether the project crosses or is in proximity to a site known to have had a hazardous materials release or to represent a threat to human health and the environment. Because this statute was enacted more than 20 years ago, some of the provisions refer to agency activities that are no longer being implemented, and, in some cases, the information to be included in the Cortese List does not exist. Government Code Section 65962.5 makes reference to the preparation of a “list,” but many changes have occurred related to Web-based information access since 1992, and this information is now largely available on the websites of the responsible organizations. The following sources, databases, and lists comprise the Cortese List:

- **Hazardous waste and substance sites from DTSC’s EnviroStor database.** The EnviroStor database is an online search and GIS tool for identifying sites that have known contamination or sites for which there may be reason to investigate further. The EnviroStor database includes the following site types: Federal Superfund sites (National Priorities List); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. As discussed below, this list was reviewed for cleanup sites within 0.5 miles of the Fullerton College campus.
- **List of leaking underground storage tank (UST) sites from the State Water Resources Control Board’s (SWRCB) GeoTracker database.** GeoTracker is the SWRCB’s online search and GIS tool for sites that impact groundwater or have the potential to impact groundwater. GeoTracker contains sites that require groundwater cleanup (leaking USTs, Department of Defense sites, and Site Cleanup Program sites), as well as permitted facilities that could impact groundwater (irrigated lands, oil and gas production, operating USTs, and land disposal sites.) As discussed below, this list was reviewed for cleanup sites within 0.5 miles of the Fullerton College campus.
- **List of solid waste disposal sites identified by SWRCB with waste constituents higher than hazardous waste levels outside the waste management unit.** Review of this list revealed one site within the City. The site is the “McColl sludge disposal site,” but it is not close to Fullerton College (i.e., approximately 4 miles to the northwest) (CalEPA 2017).

## Initial Study for the Sherbeck Field Improvements Project

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- **List of active cease-and-desist orders and cleanup and abatement orders from SWRCB.** Review of this list revealed no sites within the City (CalEPA 2017).
- **List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the California Health and Safety Code, as identified by DTSC.** This list only includes two sites in California, neither of which is near the proposed project site (CalEPA 2017).

The GeoTracker database and the DTSC EnviroStor database were reviewed to determine the location, type, and cleanup status of sites within 0.5 miles of the Fullerton College campus (DTSC 2017; SWRCB 2017). EnviroStor and GeoTracker are state databases that track the status and compliance activities of sites undergoing cleanup or remediation under the jurisdiction of the DTSC and SWRCB. The SWRCB generally oversees site assessment and cleanup activities for land uses and activities with potential for adverse effects on the state's water quality and drinking water supplies (including groundwater), and the DTSC oversees cleanup cases that have resulted in soil contamination that may pose a threat to human health or the environment. These databases are presented as geographic map viewers, and the location of cleanup sites are stored in a point database that can be queried using GIS.

Based on this review, 13 sites were identified in the GeoTracker database as leaking UST sites, all of which have received case closure from the SWRCB (SWRCB 2017). Case closure means that the SWRCB has determined that the site no longer poses a significant threat to the environment (i.e., through a determination that the contaminants of concern have been adequately contained and pose little risk of migration) or that the site has been adequately remediated. The closest site is a record for Fullerton College that indicates a prior release of petroleum (spillage from overfilling), discovered during UST closure in 1993 (Hydrologue Inc. 2003). A cleanup action addressed the issue, and a "no further action" letter was issued by the RWQCB in 2004 (SWRCB 2017).

In addition, Fullerton High School is listed in the EnviroStor database as a School Cleanup Program site. A proposed school expansion project prompted an environmental investigation to examine potential concerns associated with four USTs, a boiler room, numerous pad-mounted transformers, and potential lead- or asbestos-containing materials (DTSC 2017). Environmental investigation included a records search, site reconnaissance, and soil and soil gas samples for metals, PCBs, volatile organic compounds, and total petroleum hydrocarbons (Hydrologue Inc. 2003). Based on these investigations, DTSC's no further action letter indicates that "no actual or potential release of hazardous material nor the presence of naturally occurring hazardous material

## Initial Study for the Sherbeck Field Improvements Project

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which would pose a threat to human health or the environment under any land use was indicated at the site” (DTSC 2004).

According to environmental records searches (Hydrologue Inc. 2003), Fullerton College has five USTs:

- 2,000-gallon single-walled unlined carbon steel tank (waste oil) installed in 1958
- 1,000-gallon single-walled carbon steel tank (waste oil) installed in 1961
- 8,500-gallon unlined carbon steel tank (waste oil) installed in 1964
- 10,000-gallon single-walled unlined carbon steel tank (waste oil) installed in 1975
- 10,000-gallon unlined carbon steel tank (waste oil) installed in 1975

The Fullerton Fire Department and the Orange County Department of Environmental Health were contacted to obtain records pertaining to the Fullerton College campus, including hazardous materials inventories and the Hazardous Materials Business Plan. According to the documents received, the USTs were associated with a boiler plant and have been removed or abandoned in place (Fullerton Fire Department n.d.).

In summary, there is one site within the project boundary identified in Government Code Section 65962.5 (i.e., Cortese List). The Fullerton College site references a prior release of petroleum (spillage from overfilling) discovered during UST closure in 1993 (SWRCB 1993). A cleanup action addressed the issue, and a no further action letter was issued by the RWQCB in 2004 (SWRCB 2017). However, release cases can be closed with residual contamination in place in soils, and there may be locations on campus with previously unidentified contamination. Therefore, impacts are potentially significant.

- e) ***For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?***

**No Impact.** The Airport Land Use Commission for Orange County has adopted the Airport Environs Land Use Plan. The project site is located approximately 3.4 miles east of Fullerton Municipal Airport. The project site is not located within the planning area for Fullerton Municipal Airport or any other airport land use plan (ALUC 2005). Additionally, proposed project activities would not pose a hazard for people residing or working in the project area. Although the proposed project would include construction of bleachers and lighting stanchions, the project site is not located within the height restriction zone for Fullerton Municipal Airport or any other airport. Impacts would not occur, and this topic will not be analyzed further in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- f) *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

**No Impact.** The proposed project is not located within the vicinity of a private airstrip. No private airstrips exist within 2 miles of the project site; therefore, there would be no impact and this issue will not be analyzed further in the EIR.

- g) *Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

**Less-Than-Significant Impact.** Construction of the proposed project would not involve road closures and would not interfere with emergency response or evacuation plans. Operation of the proposed project may result in additional traffic on surrounding roadways and within campus parking lots, especially during football games and special events. Additional traffic would increase the difficulty of evacuating the campus population and the project site in the event of an emergency. However, the proposed project is not anticipated to significantly impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Permitting requirements mandate that the fire department and the Division of the State Architect perform a fire and life safety review and an access compliance review, respectively, prior to approval of proposed project drawings and specification documents. Therefore, emergency response and evacuation as a result of the proposed project would be adequately evaluated to ensure the safest possible conditions for students, staff, and visitors to Sherbeck Field and the Fullerton College campus. Implementation of the proposed project would not interfere with an adopted emergency response or evacuation plan. Impacts would be less than significant and no further analysis is required. This topic will not be analyzed in the EIR.

- h) *Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*

**No Impact.** It is unlikely that the proposed project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires. The proposed project is in a completely urbanized area that contains no adjacent wildlands (City of Fullerton 2012c). Additionally, the area surrounding the project site is generally urbanized and developed. Therefore, impacts would not occur and no further analysis is required. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.9 Hydrology and Water Quality

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX. HYDROLOGY AND WATER QUALITY – Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

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- a) *Would the project violate any water quality standards or waste discharge requirements?*

***Less-Than-Significant Impact.*** Impacts to water quality could result from short-term effects of construction activities (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas, and improper handling of hazardous materials).

As described in Section 3.5, Construction Activities, grading would consist of over-excavation within the bleacher areas, ramp areas, storage building area, and within proposed paved areas to a depth of 3 feet. Therefore, the proposed project would involve minimal excavation and grading activities that would expose soils. Additionally, the proposed project would comply with the measures outlined in the District's SWMP (Ninyo and Moore 2015). The SWMP requires that the construction management team or contractor inspect the project site on a weekly basis to prevent erosion and stormwater runoff from occurring. Additionally, project construction would be subject to stormwater BMPs. The impact would be less than significant and no further analysis is required in the EIR.

- b) *Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?*

***Less-Than-Significant Impact.*** The City's water utility provides water services to the Fullerton College campus. The City receives its water from two main sources: (1) local well water from the Lower Santa Ana River Groundwater Basin, which is managed by the Orange County Water District (OCWD), (2) and imported water from the Metropolitan Water District of Southern California (City of Fullerton 2016a). Water supply from the City's groundwater wells accessing the Orange County Groundwater Basin is constrained by the allowable "basin production percentage,"<sup>3</sup> which is set by the OCWD on an annual basis. The OCWD has been the primary agency managing the groundwater basin since 1933. The OCWD works collaboratively with the Metropolitan Water District and other local water districts, such as the City, to implement a program to manage the groundwater basin to ensure a safe and sustainable supply.

Under the existing condition, the project site consists of a turf football field that is surrounded by a 400-meter track, a two-story field house on the western edge of the field,

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<sup>3</sup> The basin pumping percentage is the ratio of groundwater production to total water demand, expressed as a percentage.

## Initial Study for the Sherbeck Field Improvements Project

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a scoreboard on the eastern end of the field, and an existing sound system. The proposed project would involve installation of bleachers, lighting, a sound system, a press box, and a storage building. These project components would not result in an increase in water demand. Thus, the proposed project would not require additional water utility services from the City, and would not increase groundwater demand. Because the proposed project would not generate increased water demands that could substantially deplete groundwater supplies, and because OCWD actively manages groundwater basin supplies, the proposed project would result in less-than-significant impacts to groundwater resources. This topic will not be analyzed further in the EIR.

- c) ***Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?***

***Less-Than-Significant Impact.*** Increases in impervious areas associated with the project could alter the types and levels of pollutants that could be present in project site runoff. Under existing conditions, stormwater that is not infiltrated through landscaped areas moves as sheet flow toward street gutters, swales, and the inlets of underground storm drains. The storm drains direct runoff to the City storm drain system and the Fullerton Creek channel, and eventually into the Pacific Ocean through Coyote Creek/Lower San Gabriel River. Under proposed conditions, stormwater runoff would generally behave in the same manner, and drainage plans would ensure that hydrologic and water quality standards are met. The site would continue to direct stormwater to the City's storm drain system.

As discussed in Section 3, Project Description, the project site consists of a turf football field that is surrounded by a 400-meter track, a two-story field house, and existing scoreboard and sound system. The project site consists largely of impervious areas, such as the field house, track, and walkways. The proposed installations would include bleachers, lighting, a sound system, a press box, and a storage building. Due to the developed nature of the project site, and since the installations would occur largely on impervious areas, much of the new construction and installations that would occur would not substantially increase the amount of impervious areas at the project site.

Additionally, because the project site is largely built-out, is located on level or gently sloping topography, and is surrounded by urban land uses, the proposed project is not anticipated to substantially modify existing topography or runoff patterns. Further, the proposed project would be subject to the most current standards for drainage design and the SWMP, which requires appropriate BMPs for erosion control measures. Therefore, the proposed project would result in less-than-significant impacts associated with



## Initial Study for the Sherbeck Field Improvements Project

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alteration of drainage patterns resulting in erosion or siltation off site. This issue will not be further analyzed in the EIR.

- d) *Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

**Less-Than-Significant Impact.** As previously addressed in Section 6.9(c), under proposed conditions, stormwater runoff would generally behave in the same manner as it currently does, and drainage plans would ensure that hydrologic and water quality standards are met. Due to the developed nature of the project site, and since the improvements would occur largely on impervious areas, much of the new construction and installations that would occur would not substantially increase the amount of impervious areas at the project site. Additionally, because the project site is largely built-out, is located on level or gently sloping topography, and is surrounded by urban land uses, the proposed project is not anticipated to substantially modify existing topography, drainage-shed boundaries, or runoff rates/patterns. Furthermore, new project facilities would be subject to the most current standards for drainage design and the Small Phase II Municipal Separate Storm Sewer System permit, which generally requires developers to mimic pre-construction drainage patterns when designing the drainage plan for a site. Therefore, the proposed project would result in less-than-significant impacts associated with alteration of drainage patterns resulting in flooding on site or off site. This issue will not be further analyzed in the EIR.

- e) *Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

**Less-Than-Significant Impact.** The potential for the project to alter drainage patterns is low due to the built-out nature of the project site and because the change in impervious surfaces would be relatively minor. As previously discussed, the proposed project would not modify existing topography, drainage sheds, or runoff rates/patterns. Therefore, the project is not anticipated to exceed the capacity of the stormwater drainage systems. On-site modifications would be required to comply with the District's SWMP to include appropriate BMPs. For these reasons, impacts related to the capacity of stormwater drainage systems would be less than significant. This issue will not be analyzed further in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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*f) Would the project otherwise substantially degrade water quality?*

**Less-Than-Significant Impact.** As previously addressed in Section 6.9(a), impacts to water quality could result from the short-term effects of construction activities (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas, improper handling of hazardous materials). Construction activities associated with the proposed project would involve the construction and installation of bleachers, lighting, a sound system, press box, and a storage building. The SWMP would incorporate BMPs to prevent or reduce, to the greatest extent feasible, adverse impacts to water quality related to the project. Thus, required compliance with the District's SWMP would ensure that water quality impacts resulting from construction-related activities would be less than significant, and no further analysis is required in the EIR.

*g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?*

**No Impact.** According to the Federal Emergency Management Agency's Flood Insurance Rate Map (06059C0043J), the project site is not located within the 100-year flood hazard area, and is outside of the 0.2% annual chance floodplain (FEMA 2009). Additionally, the proposed project does not include a housing component. Therefore, the proposed project would not locate housing within a 100-year flood hazard area. Impacts would not occur, and no further analysis is required. This topic will not be analyzed in the EIR.

*h) Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?*

**No Impact.** According to the Federal Emergency Management Agency's Flood Insurance Rate Map, the project site is not located within the 100-year flood hazard area, and is outside of the 0.2% annual chance floodplain (FEMA 2009). Therefore, the proposed project would not place structures that would impede or redirect flood flows in a 100-year flood hazard area. Impacts would not occur, and this topic will not be analyzed in the EIR.

*i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?*

**Less-Than-Significant Impact.** The project site is located in the vicinity of two dams: the Brea Dam (1 mile away) and the Fullerton Dam (2.5 miles away). Both dams are owned by the U.S. Army Corps of Engineers and are typically kept almost empty; the flood control storage for the Brea and Fullerton Reservoirs are 7,420 acre-feet and 1,342 acre-

## Initial Study for the Sherbeck Field Improvements Project

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feet, respectively (County of Orange 2011). Dams are engineered and regularly monitored/ and inspected by the Department of Water Resources and/or U.S. Army Corps of Engineers to ensure that they remain stable in flooding and earthquake scenarios, and to ensure that problems or deficiencies are detected and repaired.

The failure of either of these dams would cause downstream flooding and would likely result in loss of life and property, but the potential for such a failure to occur is extremely low. This is a preexisting environmental condition and the project would have no effect on the likelihood, severity, or extent of the dam failure/inundation. The project would entail construction and installation of bleachers, lighting, a sound system, a press box, and a storage building, but would not involve construction of housing. As discussed in Section 6.13, Population and Housing, the proposed project could accommodate the projected growth of the Fullerton College campus; however, the proposed project would not directly or indirectly induce substantial population growth. Further, as described in Section 6.8, Hazards and Hazardous Materials, the permitting requirements mandate that the Fire Department and the Division of the State Architect perform a fire and life safety review and an access compliance review, respectively, prior to approval of proposed project drawings and specification documents.

Because the proposed project would have no effect on the likelihood, severity, or extent of dam failure/inundation, would not disproportionately induce growth in an area subject to dam inundation, and because emergency plans and procedures are in place, the proposed project would have a less-than-significant impact with regard to dam and levee failure hazards. This topic will not be analyzed in the EIR.

**j) *Inundation by seiche, tsunami, or mudflow?***

**No Impact.** The proposed project site is approximately 14 miles from the Pacific Ocean, and the City of Fullerton is approximately 150 feet above mean sea level; therefore, the project site would not be exposed to impacts from a tsunami (City of Fullerton 2016b). The proposed project site is not in the vicinity of any surface waters or potential mudflow sources. Additionally, according to the City of Fullerton's Local Hazard Mitigation Plan, earthquake-induced seiches are not considered a risk in the City (City of Fullerton 2010). Therefore, the proposed project would not be exposed to impacts from seiche, tsunami, or mudflow, and no further analysis is required in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.10 Land Use and Planning

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. LAND USE AND PLANNING</b> – Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**a) Would the project physically divide an established community?**

**Less-Than-Significant Impact.** The physical division of an established community typically refers to the construction of a linear feature (such as a major highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community or between a community and outlying area. Under the existing conditions, the project site is not used as a connection between established communities. The proposed project would involve construction and installation of bleachers, lighting, a sound system, a press box, and a storage building. None of the proposed elements would divide or isolate an established community. Therefore, impacts would be less than significant, and no further analysis is required in the EIR.

**b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

**Less-Than-Significant Impact.** The project site currently has a zoning designation of public land (P-L), and the community development type is school; no change in zoning is proposed. The District in general, and Fullerton College specifically, are not subject to local government planning and land use plans, policies, or regulations. Therefore, impacts would be less than significant, and this topic will not be discussed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

- c) *Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?*

**No Impact.** The proposed project is not located within any adopted habitat conservation plan, natural community conservation plan, or local or regional habitat conservation plan area. The City of Fullerton General Plan does not identify any biological resource protection policies applicable to the project site (City of Fullerton 2012c). Since the proposed project is not located within any approved plan areas, it would not impact the goals or objectives of any adopted plan. Therefore, impacts would not occur, and this topic will not be discussed in the EIR.

### 6.11 Mineral Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XI. MINERAL RESOURCES – Would the project:</b>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a) *Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*

**No Impact.** According to the State of California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, there are no gas, geothermal, or other known wells located on or in the vicinity of the project site. The nearest oil wells are located approximately 0.5 miles north of the project site and are operated by Dolke-Thomas Oil Syndicate (CDC 2017). The proposed project would not result in a land use conflict with the existing oil extraction, nor would it preclude future oil extraction on underlying deposits. The project site does not contain mineral resources; therefore, the proposed project would not result in a loss of availability of a known mineral resource and no impact would occur. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

- b) *Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?*

**No Impact.** As discussed in Section 6.11(a), there are no mineral resources on the project site. No mineral resource recovery sites are delineated in The Fullerton Plan (City of Fullerton 2012f). The proposed project would not result in a land use conflict with existing oil extraction, nor would it preclude future oil extraction on underlying deposits. Therefore, the proposed project would not result in the loss of availability of a locally important mineral resource, and no impact would occur. This topic will not be analyzed in the EIR.

### 6.12 Noise

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. NOISE</b> – Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

- a) *Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

**Potentially Significant Impact.** The proposed project could expose people to a noise level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Excessive noise could result from construction activities and the operation of construction vehicles. Additionally, the proposed project could result in the exposure of persons to noise levels in excess of established standards due to noise generated by the new sound system and associated with sporting events, classes, or other special events, as well as traffic noise. The City has established interior and exterior noise standards, which vary depending on time of day. These standards are summarized in Table 3.

**Table 3**  
**City of Fullerton Interior and Exterior Noise Standards**

Time Period	Noise Level (dBA) at Property Line	
	Exterior	Interior
7:00 a.m.–10:00 p.m.	55	55
10:00 p.m.–7:00 a.m.	50	45
<i>For residential noise zones and sensitive uses, the following allowed noise level standards shall not be exceeded:</i> For a cumulative period of more than 30 minutes in any hour; or The noise standard plus 5 dBA for a cumulative period of more than 15 minutes, but less than 30 minutes in any hour; or The noise standard plus 10 dBA for a cumulative period of more than 5 minutes, but less than 15 minutes in any hour; or The noise standard plus 15 dBA for a cumulative period of more than 1 minute, but less than 5 minutes in any hour; or The noise standard plus 20 dBA for a cumulative period of less than 1 minute in an hour.		

Source: City of Fullerton 2012e

It is possible that construction and operational activities could exceed the noise levels summarized in Table 3; therefore, impacts would be potentially significant. This issue will be analyzed in the EIR.

- b) *Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?*

**Potentially Significant Impact.** Construction activities could generate or expose people to excessive groundborne vibration or groundborne noise levels that exceed the groundborne vibration and noise thresholds established by the City of Fullerton.

Additionally, construction activities could expose Raymond Elementary School, Fullerton Union High School, and nearby residences to excessive groundborne vibrations and noise. Impacts are potentially significant, and this issue will be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- c) *Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

**Potentially Significant Impact.** The proposed project site is already developed as Sherbeck Field. However, the proposed project could result in a substantial permanent increase in ambient noise levels due to operation of the new sound system, extended hours of operation, use of the field for football games, and increased traffic noise. Impacts are potentially significant, and this topic will be analyzed in the EIR.

- d) *Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

**Potentially Significant Impact.** The proposed project could result in a substantial temporary or periodic increase in ambient noise levels due to construction activities. Impacts are potentially significant, and this issue will be analyzed in the EIR.

- e) *Would the project be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

**Less-Than-Significant Impact.** The project site is not located within the planning area for Fullerton Municipal Airport or any other airport land use plan (ALUC 2005), and Fullerton Municipal Airport is approximately 3.1 miles west of the project site. Therefore, there is little potential to expose people residing or working in the project area to excessive noise levels. Impacts would be less than significant, and this issue will not be analyzed further in the EIR.

- f) *Would the project be within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*

**No Impact.** The proposed project is not located within the vicinity of a private airstrip. No private airstrips exist within 2 miles of the project site. People residing or working in the proposed project area would not be exposed to excessive noise levels from a private airstrip. No impacts would occur, and no further analysis is required. This topic will not be analyzed in the EIR.



## Initial Study for the Sherbeck Field Improvements Project

### 6.13 Population and Housing

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII. POPULATION AND HOUSING</b> – Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a) *Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*

**Less-Than-Significant Impact.** The proposed project would involve improvements to Sherbeck Field, including the construction and installation of bleachers, lighting, a sound system, a press box, and a storage building. Although the field improvements would accommodate future growth, the proposed project would not directly or indirectly induce population growth. The field improvements would not involve habitable structures, the construction of which could generate residents. Additionally, campus programs would remain largely the same, without requiring additional campus employees. The project site is in a developed portion of the City with existing infrastructure and roads that could serve the project, and the project would not generate additional utility and service demands. Therefore, this impact would be less than significant and will not be analyzed further in the EIR.

- b) *Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?*

**No Impact.** The proposed project would not displace existing housing. The project would involve construction and installation of bleachers, lighting, a sound system, a press box, and a storage building on an existing field. No housing units currently exist on campus. No impact would occur, and no further analysis is required. The topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

- c) *Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?*

**No Impact.** The proposed project would not displace substantial numbers of people. There are no plans to move any facilities that would result in the displacement of people from the project area. No impact would occur, and no further analysis is required. This topic will not be analyzed in the EIR.

### 6.14 Public Services

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIV. PUBLIC SERVICES</b>				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a) *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:*

#### ***Fire protection?***

**Potentially-Significant Impact.** The proposed project could increase the number of visitors to the site at specific times, such as during football games, which could impact fire protection services. Therefore, impacts are potentially significant, and this issue will be analyzed further in the EIR.

#### ***Police protection?***

**Potentially-Significant Impact.** The proposed project could increase the number of visitors to the site at specific times, such as during football games, which could impact

## Initial Study for the Sherbeck Field Improvements Project

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police protection services. Impacts would be potentially significant, and this issue will be analyzed further in the EIR.

### *Schools?*

***Less-Than-Significant Impact.*** The proposed project would not involve the development of campus housing that would generate additional students. Although the field lighting would allow for more evening class options for the physical education program to meet student demand, the project would not directly or indirectly induce substantial population growth. Therefore, the Fullerton School District and Fullerton Joint Union High School District located in the City would not experience adverse impacts resulting from the proposed project. Impacts would be less than significant, and this issue will not be analyzed further in the EIR.

### *Parks?*

***No Impact.*** The proposed project would not result in an increase in the use of existing parks. The project would involve improvements to Sherbeck Field, the Fullerton College campus recreational facility, so athletic activities and games could remain on campus. Therefore, nearby parks would not experience an increase in visitors and acceptable service ratios would be maintained. No impacts to parks would occur, and no further analysis is required in the EIR.

### *Other public facilities?*

***No Impact.*** The proposed project would have no impact on libraries or other public facilities. The nearest library is the Fullerton Public Library, which is located approximately 1 mile southwest of the project site. The project would not generate new permanent residents in the City who would use public facilities. As such, the proposed project would not increase demand in capacity of existing libraries or other public facilities. No impacts would occur, and no further analysis is required. This issue will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.15 Recreation

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. RECREATION</b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

**No Impact.** The closest parks are Hillcrest Park, Byerrum Park, Amerige Park, and Ford Park, located 0.3, 0.4, 0.9, and 0.9 miles from Sherbeck Field, respectively. The proposed project would not result in an increase in the use of these existing parks or recreation areas. The project would involve improvements to Sherbeck Field, the Fullerton College campus recreational facility, so athletic activities and games could remain on campus. Therefore, off-site recreational facilities would not experience physical deterioration due to an increase of use. No impacts to recreational facilities would occur, and no further analysis is required in the EIR.

- b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?*

**Potentially-Significant Impact.** As discussed in Section 6.15(a), the proposed project would not increase the use of existing parks or recreation areas outside of the campus. Therefore, the expansion or addition of off-site recreational facilities or parks would not be required. However, the proposed project would involve improvements to Sherbeck Field, which could result in an adverse physical effect to the environment. Impacts are potentially significant, and further analysis is required in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

### 6.16 Transportation and Traffic

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVI. TRANSPORTATION/TRAFFIC</b> – Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- a) *Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*

**Potentially Significant Impact.** The proposed project could conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the traffic circulation system. Applicable plans include the Built Environment Element of The Fullerton Plan. The proposed project has the potential to increase traffic on streets

## Initial Study for the Sherbeck Field Improvements Project

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immediately surrounding the campus, including North Lemon Street, East Chapman Avenue, Nutwood Place, and North Berkeley Avenue.

If an increase in traffic would result in level of service (LOS) scores lower than “E,” or the baseline LOS if worse than LOS E, for signalized and unsignalized intersections (City of Fullerton 2012a), impacts would be potentially significant. A traffic impact analysis will be conducted and the results included in the EIR.

- b) *Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*

**Potentially Significant Impact.** The proposed project could conflict with the Orange County Congestion Management Program (CMP) (OCTA 2015). As described in Section 6.16(a), conflicts could occur due to an increase in traffic on surrounding streets. The CMP requires that intersections do not fall below LOS E. It is unknown whether the proposed project would conflict with LOS standards or any other standards set by the CMP, and impacts would be potentially significant. A traffic impact analysis will be conducted and the results included in the EIR.

- c) *Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?*

**No Impact.** According to Exhibit 16 of The Fullerton Plan, the project site is outside of the Fullerton Municipal Airport Runway Protection Zone. Consequently, the proposed project would not change air traffic patterns or result in substantial safety risks regarding air traffic (City of Fullerton 2012a). No impact would occur and this topic will not be addressed in the EIR.

- d) *Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

**No Impact.** The proposed project would not involve construction of any transportation-related elements, nor would operations involve incompatible uses to the transportation system. The project site would continue to be used as an athletic field. No impacts related to hazardous design features or incompatible uses would occur, and no further analysis is required. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

**e) Would the project result in inadequate emergency access?**

**Potentially Significant Impact.** The proposed project could result in inadequate emergency access due to an increase in traffic, particularly during football games and special events. A traffic impact analysis is required to determine whether the project would affect emergency access. Impacts are potentially significant and will be analyzed further in the EIR.

**f) Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?**

**Potentially Significant Impact.** The proposed project could conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities in the Built Environment Element of The Fullerton Plan or the Orange County CMP (City of Fullerton 2012a; OCTA 2015). A traffic impact analysis is required to determine whether the proposed project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. Impacts are potentially significant and will be analyzed further in the EIR.

### 6.17 Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. TRIBAL CULTURAL RESOURCES</b>				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

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a) *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

i) *Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?*

**Potentially Significant Impact.** As discussed in Section 6.5, the CHRIS records search indicated that 40 built environment resources and one archaeological resource, a historic-era refuse deposit, were previously recorded within a 0.5-mile search radius of the Fullerton College campus. No prehistoric resources have been recorded within 0.5-mile of the project site. The proposed project, however, is subject to compliance with Assembly Bill 52 (California Public Resources Code, 21074), which requires consideration of impacts to tribal cultural resources as part of the CEQA process. In compliance, the CEQA lead agency is required to notify any groups (who have requested notification) traditionally or culturally affiliated with the geographic area of the proposed project. The District received one consultation request from California Native American tribes for Assembly Bill 52 project notification. The request came from Andrew Salas, Chairman of the Gabrieleño Band of Mission Indians–Kizh Nation, who the District has been in consultation with in accordance with Assembly Bill 52 regarding the identification of Tribal Cultural Resources within or adjacent to the proposed project site. However, to date no known geographically-defined TCRs were identified within, or in the immediate vicinity of, the campus during consultation for the Fullerton College Facilities Master Plan project. Ongoing consultation will occur and will include specific discussions relating to the Sherbeck Field project area. Therefore, impacts are potentially significant.

ii) *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?*

**Potentially Significant Impact.** As stated above, the proposed project is subject to compliance with Assembly Bill 52 (California Public Resources Code, 21074). The District received one request from California Native American tribes for



## Initial Study for the Sherbeck Field Improvements Project

Assembly Bill 52 project notification. The request came from Andrew Salas, Chairman of the Gabrieleño Band of Mission Indians–Kizh Nation, who the District has consulted with, and will continue to actively engage, in accordance with Assembly Bill 52 regarding the identification of Tribal Cultural Resources within or adjacent to the proposed project site. However, to date no known geographically-defined TCRs were identified within, or in the immediate vicinity of, the campus during consultation for the Fullerton College Facilities Master Plan project. Ongoing consultation will occur and will include specific discussions relating to the Sherbeck Field project area.

Therefore, in the event that unanticipated archaeological resources (sites, features, or artifacts) and/or potential Tribal Cultural Resources are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find would be required to immediately halt. The Native American tribes that have informed the District they are traditionally and culturally affiliated with the geographic area of the proposed project should be notified. If the City determines that a potential resource appears to be a Tribal Cultural Resource (as defined by PRC Section 21074), the City would provide any affected tribe a reasonable period of time to conduct a site visit and make recommendations regarding the monitoring of future ground disturbance activities, as well as the treatment and disposition of any discovered Tribal Cultural Resources. Therefore, impacts are potentially significant.

### 6.18 Utilities and Service Systems

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVIII. UTILITIES AND SERVICE SYSTEMS – Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**a) *Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?***

**No Impact.** Orange County Sanitation District (OCSD) is responsible for collecting, treating, and disposing of wastewater generated in the project area. OCSD maintains and operates Reclamation Plant No. 1 and Treatment Plant No. 2, located in Fountain Valley and Huntington Beach, respectively, as well as 15 pump stations located in the OCSD service area (479 square miles) (OCSD 2016). Reclamation Plant No.1 has a primary capacity of 204 million gallons per day (mgd), and treats water to be reclaimed by the Orange County Water District for landscape irrigation use and groundwater replenishment. Additional treated effluent from Reclamation Plant No. 1 is also sent to Treatment Plant No. 2, where effluents are mixed, dechlorinated with sodium bisulfite, and disposed of in the ocean (OCSD 2011). For the 2015/2016 fiscal year, average wastewater flows at Reclamation Plant No. 1 were 117 mgd, and flows at Reclamation Plant No. 2 were 67 mgd, totaling 184 mgd (OCSD 2017). Both of these reclamation plants are required to comply with the wastewater treatment requirements in the National Pollutant Discharge Elimination System permit, Order No. R8-2012-0035/CA0110604 (Santa Ana RWQCB 2012).

The City's sewer system operates entirely by gravity and discharges to several OCSD trunk sewer lines (OCSD 2017). However, the proposed project would not require additional connection to the City's sewer lines. Implementation of the proposed project would involve construction and installation of bleachers, lighting, a sound system, a press box, and a storage building. None of these project features would require wastewater utility services. Therefore, the proposed project would not generate wastewater that would exceed OCSD's ability to meet RWQCB requirements, and no impacts would occur. This topic will not be analyzed further in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- b) *Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

### **Water Facilities**

**No Impact.** The City's water utility provides water service within its 22.3-square-mile service area, which is contiguous with the City boundary. The City receives its water from two main sources: (1) local well water from the Lower Santa Ana River Groundwater Basin, which is managed by the Orange County Water District; (2) and imported water from the Metropolitan Water District of Southern California. The City is a member agency of Metropolitan Water District of Southern California, which delivers surface water from the State Water Project and Colorado River. The City has 11 wells, located in the southern sector of the City. Water pumped from these wells is naturally filtered as it passes through underlying aquifers of sand, gravel, and soil (City of Fullerton 2016a).

The proposed project would not induce population growth such that there would be an adverse impact to the City's ability to provide water without the construction or expansion of water facilities. The proposed project would involve installation of bleachers, lighting, a sound system, a press box, and a storage building. None of these project features would necessitate new or expanded water facilities. Therefore, impacts to water facilities would not occur, and this topic will not be analyzed further in the EIR.

### **Wastewater Facilities**

**No Impact.** As addressed in Section 6.18(a), the City's sewer system operates entirely by gravity and discharges to several OCSD trunk sewer lines. OCSD maintains and operates Reclamation Plant No. 1 and Reclamation Plant No. 2, currently designed with a capacity of 144 mgd and 108 mgd, respectively. For the 2015/2016 fiscal year, average wastewater flows at Reclamation Plant No. 1 were 117 mgd, and flows at Reclamation Plant No. 2 were 67 mgd, totaling 184 mgd (OCSD 2017). Thus, under their current design capacities, Reclamation Plant Nos. 1 and 2 have a collectively surplus treatment capacity of approximately 68 mgd. However, the project would not include generation of wastewater such that wastewater treatment facilities would need to be constructed or expanded. Therefore, impacts related wastewater facilities would not occur, and this topic will not be analyzed further in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- c) *Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

**Less-Than-Significant Impact.** Increases in impervious areas associated with the project could alter the types and levels of pollutants that could be present in project site runoff, which would require storm drainage facilities. Under existing conditions, stormwater that is not filtered through landscaped areas moves as sheet flow toward street gutters, swales, and the inlets of underground storm drains. The storm drains direct runoff to the City storm drain system and the Fullerton Creek channel, and eventually into the Pacific Ocean through Coyote Creek/Lower San Gabriel River. Under proposed conditions, stormwater runoff would generally behave in the same manner, and drainage plans would ensure that hydrologic and water quality standards are met. The site would continue to direct stormwater off site to the City's storm drain system. The municipal storm drain would then convey flows to the south for discharge into the Fullerton Creek channel, which consists of a reinforced concrete rectangular channel (28 feet wide by 15 feet high) maintained by the Orange County Flood Control District (OCFCD 2000).

As discussed in Section 3, Project Description, the project site consists of a turf football field that is surrounded by a 400-meter track, a two-story field house, and an existing scoreboard and sound system. The project site consists largely of impervious areas, such as the field house, track, and walkways. The proposed installations would include bleachers, lighting, a sound system, a press box, and a storage building. Due to the developed nature of the project site, and since the installations would occur largely on impervious areas, much of the new construction and installations that would occur would not substantially increase the amount of impervious areas at the project site, such that construction or expansion of stormwater drainage facility would be required. Therefore, impacts involving the construction or expansion of a storm drain facility would be less than significant, and this topic will not be analyzed further in the EIR.

- d) *Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

**No Impact.** As discussed Section 6.18(b), the proposed project would not induce population growth such that there would be an adverse impact to the City's ability to provide water from existing entitlements and resources. The proposed project would involve installation of bleachers, lighting, a sound system, a press box, and a storage building. None of these project features would require additional water supplies. Therefore, impacts related to water supplies would not occur, and this topic will not be analyzed further in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

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- e) *Would the project result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

**No Impact.** As addressed in Section 6.18(a), the City's sewer system operates entirely by gravity and discharges to several OCSD trunk sewer lines. OCSD maintains and operates Reclamation Plant No. 1 and Reclamation Plant No. 2, currently designed with a capacity of 144 mgd and 108 mgd, respectively. For the 2015/2016 fiscal year, average wastewater flows at Reclamation Plant No. 1 were 117 mgd, and flows at Reclamation Plant No. 2 were 67 mgd, totaling 184 mgd (OCSD 2017). Thus, under their current design capacities, Reclamation Plant Nos. 1 and 2 have a collectively surplus treatment capacity of approximately 68 mgd. However, the project would not include generation of wastewater such that OCSD would require additional capacity to serve the project. Therefore, impacts related wastewater treatment capacity would not occur, and this topic will not be analyzed further in the EIR.

- f) *Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*

**Less-Than-Significant Impact.** The Orange County Solid Waste Management System is composed of three landfills: Olinda Alpha Landfill, Frank R. Bowerman Landfill, and Prima Deshecha Landfill. Collected waste from the project site would be transported to Madison Resource Recovery Facility in Santa Ana, which recovers upward of 75% of materials transported to this facility (Ware Disposal Company 2017). The residual solid waste stream recovered from the Madison Resource Recovery Facility is then transported to the Frank R. Bowerman Landfill in Irvine and Olinda Alpha Landfill in Brea (Ware 2016). The Frank R. Bowerman Landfill permits a maximum of 11,500 tons of waste per day, and does not accept public dumping. Olinda Alpha accepts public dumping and permits a maximum of 8,000 tons per day (County of Orange 2017).

The proposed project would not involve demolition of any existing structures. In addition, given the maximum tons of waste accepted per day at the landfill, any waste generated by the proposed project would represent a nominal percentage of the maximum waste accepted. Therefore, the project could be served by a landfill with sufficient permitted capacity, and impacts would be less than significant. This topic will not be analyzed in the EIR.

## Initial Study for the Sherbeck Field Improvements Project

- g) *Would the project comply with federal, state, and local statutes and regulations related to solid waste?*

***Less-Than-Significant Impact.*** All collection, transportation, and disposal of solid waste generated by the proposed project would comply with all applicable federal, state, and local statutes and regulations. In particular, AB 341 requires that at least 75% of solid waste generated by a jurisdiction be diverted from landfill disposal through source reduction, recycling, or composting by 2020. Regional agencies, counties, and cities are required to develop a waste management plan that would achieve a 75% diversion from landfills (PRC Section 40000 et seq.).

Solid waste generated by Fullerton College is collected and transported by Ware Disposal Company, which is permitted and licensed to collect and transport solid waste. Once collected, solid waste is transported to sorting/disposal facilities permitted to accept commercial solid waste, with each facility's operations routinely inspected by regional and state regulatory agencies for compliance with all applicable statutes and regulations. Given these considerations, impacts associated with solid waste statutes and regulations would be less than significant. This topic will not be further analyzed in the EIR.

### 6.19 Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIX. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Initial Study for the Sherbeck Field Improvements Project

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- a) *Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?*

**Less-Than-Significant Impact.** As discussed in Sections 6.4 and 6.5, the proposed project would not have the potential to cause significant impacts to biological or cultural resources. Therefore, impacts would be less than significant and no further analysis is required. This topic will not be analyzed in the EIR.

- b) *Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?*

**Potentially Significant Impact.** The proposed project could have impacts that are individually limited but cumulatively considerable, and impacts would be potentially significant. The EIR will analyze past, present, and reasonably foreseeable projects in the vicinity of the proposed project.

- c) *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

**Potentially Significant Impact.** The proposed project could have environmental effects that would cause substantial adverse effects on human beings, and impacts would be potentially significant. This topic will be analyzed further in the EIR.

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## **Initial Study for the Sherbeck Field Improvements Project**

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### **7.2 List of Preparers**

#### **North Orange County Community College District**

Richard Williams, District Director, Facilities Planning and Construction

#### **Fullerton College**

Greg Schulz, President, Fullerton College

Oscar Saghie, Project Manager, Campus Capital Projects

Rodrigo Garcia, Vice President Administrative Services

Larry Lara, Director, Physical Plant/Facilities

David Grossman, Ed.D, Dean of Physical Education

Scott Giles, Athletic Director

#### **Dudek**

Rachel Struglia, PhD, AICP, Principal in Charge

Caitlin Munson, Project Manager

Sabrina Alonso, Environmental Analyst

Anne McDonnell, Technical Editor

Devin Brookhart, Publications Specialist Lead

Taylor Eaton, Publications Specialist

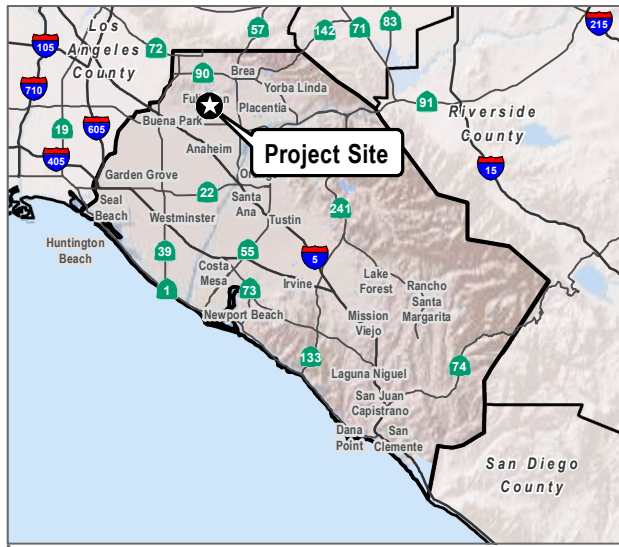
Andrew Greis, GIS Technician

## **Initial Study for the Sherbeck Field Improvements Project**

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SOURCE: NAIP 2016

**DUDEK**

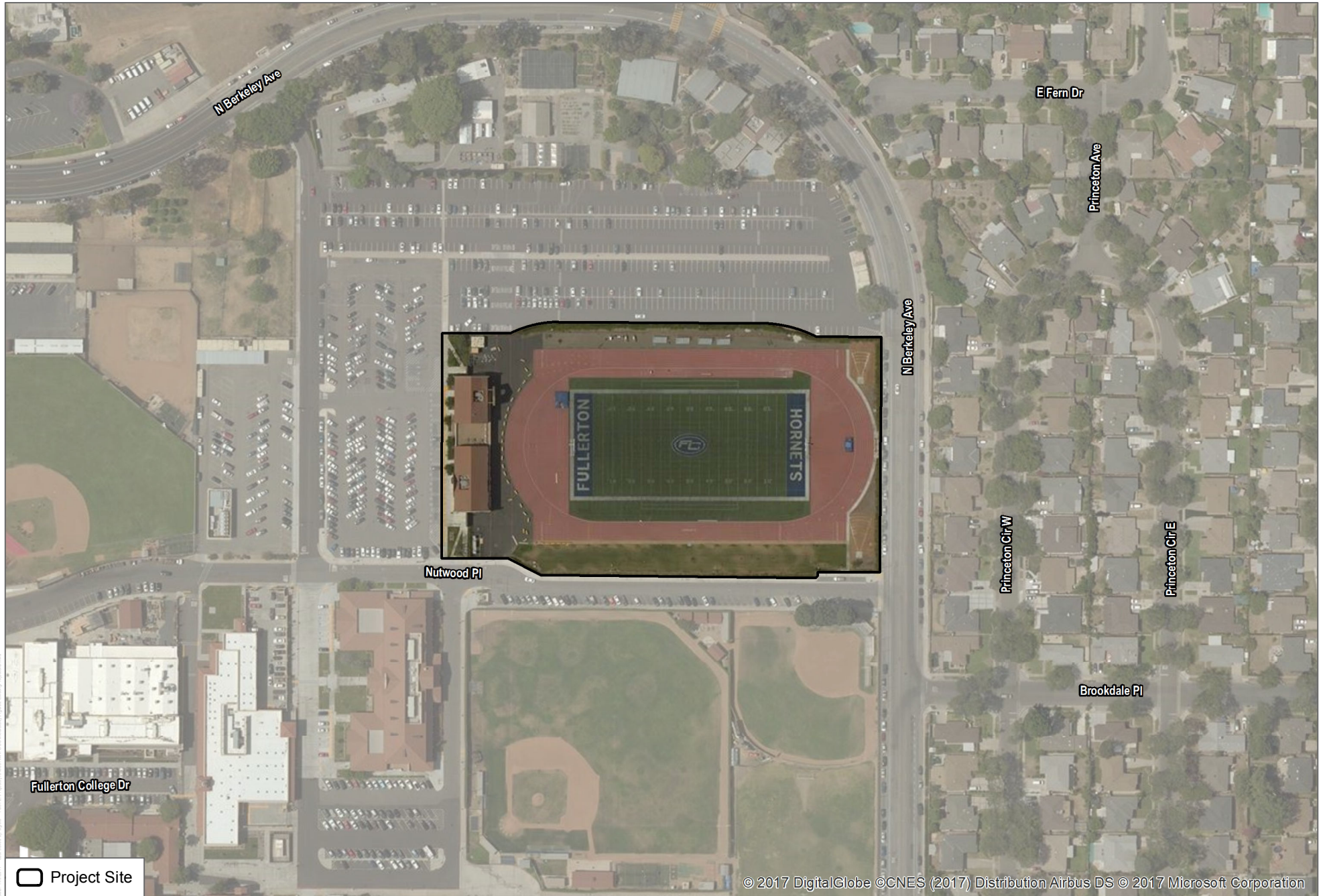


**FIGURE 1**  
**Project Location**

Sherbeck Field Improvements Project Initial Study



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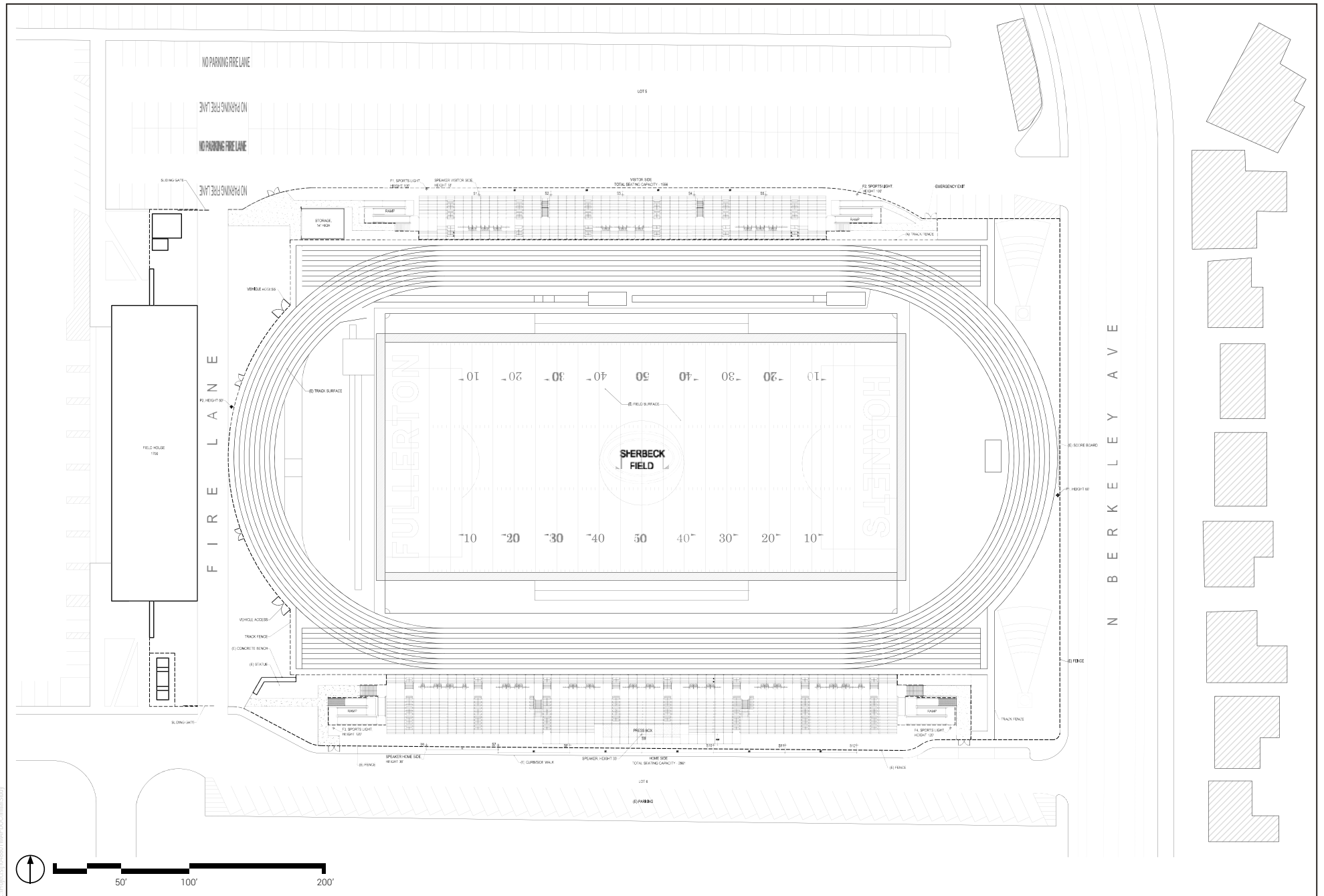


SOURCE: Bing Maps

## **Initial Study for the Sherbeck Field Improvements Project**

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SOURCE: DLR Group, 2018

**DUDEK**

**FIGURE 3**

**Proposed Site Plan**

Sherbeck Field Improvements Project Initial Study

## **Initial Study for the Sherbeck Field Improvements Project**

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SOURCE: DLR Group, 2018

**DUDEK**

**FIGURE 4a**  
Sherbeck Field Improvements Visual Simulations  
Sherbeck Field Improvements Project Initial Study

## **Initial Study for the Sherbeck Field Improvements Project**

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Project: Sherbeck Field Improvements

SOURCE: DLR Group, 2018

**DUDEK**

**FIGURE 4b**  
Sherbeck Field Improvements Visual Simulations  
Sherbeck Field Improvements Project Initial Study



## **Initial Study for the Sherbeck Field Improvements Project**

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# **APPENDIX A**

## *IS/NOP Distribution List*



Distribution List									
First Name	Last Name	Credentials	Title	Email	Organization	Division	City	State	ZIP
PROPERTY OWNERS									
SEPARATE MAILING BY COLLEGE									
Mary, Ken, Wayne	Gable, Bane, Dalin		Leadership Group		Fullerton College Neighborhood Action Council		Fullerton	CA	98231
David	Barrera		Resident				Fullerton	CA	92831
Steven	Beers		Resident				Fullerton	CA	92831
George	Borowski		Resident				Fullerton	CA	92831
Susan	Egger		Resident	sueggr@yahoo.com			Fullerton	CA	92831
Vince	Buck		Resident				Fullerton	CA	92831
Martin & Maria	Chavez		Resident				Fullerton	CA	92831
Cathy & Patrick	Crawford		Resident				Fullerton	CA	92831
Anna	Dalin		Resident	davbar32@gmail.com			Fullerton	CA	92831
Wayne	Dalin		Resident	waynedalin@hotmail.com			Fullerton	CA	92831
George	Dasney		Resident				Fullerton	CA	92831
Joshua	Ferguson		Resident				Fullerton	CA	92834
James & Patrice	Fite		Resident				Fullerton	CA	92831
Mary Frances	Gable		Resident	mfrangable@gmail.com			Fullerton	CA	92831
Laura	Gallagher		Resident	mllg@earthlink.net			Fullerton	CA	92832
Jennifer & Oliver	Gelles		Resident				Fullerton	CA	92831
Jessie & Lisa	Guzman		Resident	guzmanjessie@hotmail.com			Fullerton	CA	92832
Margaret	Hammon		Resident				Fullerton	CA	92832
Bob & Sue	Harmston		Resident				Fullerton	CA	92831
Judy	Hirou		Resident	jhirou@sbcgglobal.net			Fullerton	CA	92831
Kristyn & Kirk, Peggy	Law, Smith		Resident	knlaw15@gmail.com			Fullerton	CA	92831
Peggy	Marek		Resident				Fullerton	CA	92831
Suzanne	Muhaidly		Resident	smuhaidly@sbcgglobal.net			Fullerton	CA	92831
Anne	Murphy		Resident	anne.murphy@asmnet.com			Fullerton	CA	92831
Mark & Irene	Myers		Resident	immyers@yahoo.com			Fullerton	CA	92831
Sean	Paden		Resident				Fullerton	CA	92831
Damion	Planchon		Resident	damioon@damionlloyd.com			Fullerton	CA	92831
Ramy	Raoof		Resident	raoof.ramy@gmail.com					
P	Reichman		Resident				Fullerton	CA	92832
Anne	Richard						Fullerton	CA	92831
Connie	Richard		Resident				Fullerton	CA	92831
Laura	Richard-Barasch		Resident				Fullerton	CA	92832
Mary	Rock		Resident	irockmrh@gmail.com			Fullerton	CA	92832
Desi	St. Amant		Resident	dstamant07@gmail.com			Fullerton	CA	92831
Jonathan	St. Amant		Resident	jonsaintamant@gmail.com			Fullerton	CA	92831
George	Stephens		Resident				Fullerton	CA	92831
Jane	Sylvester		Resident				Fullerton	CA	92831
Jonathan	Taylor		Resident	jstaylor@fullerton.edu			Fullerton	CA	92831
Linda & Todd	Warden		Resident	naclhed@gmail.com			Fullerton	CA	92832
LIBRARIES									
Maureen	Gebelein		Library Director		Fullerton Public Library		Fullerton	CA	92832
LOCAL--COUNTY--REGIONAL									
Hugh	Nguyen		Clerk-Recorder		County of Orange		Santa Ana	CA	92701
Matt	Foulkes		Planning Manager		City of Fullerton	Community Development	Fullerton	CA	92832
Joan	Wolff		Senior Planner		City of Fullerton	Planning Division	Fullerton	CA	92832
Donald	Hoppe		Director of Public Works		City of Fullerton	Public Works Department	Fullerton	CA	92832
Allan	Roeder		City Manager		City of Fullerton		Fullerton	CA	92832
Ernie	Kelsey		President		Fullerton Heritage		Fullerton	CA	92834
Joel	Rosen	AICP	Director		City of Buena Park	Planning Division	Buena Park	CA	90622

David	Jacobs	P.E., L.S.	Interim Director of Public Works / City Engineer		City of Buena Park	Public Works Department	Buena Park	CA	90622
David	Belmer		Planning Director		City of Anaheim	Planning Services	Anaheim	CA	92805
Natalie	Meeks		Public Works Director		City of Anaheim	Public Works Department	Anaheim	CA	92805
Lori	Thompson		Community Services Director		City of La Mirada	Planning Division	La Mirada	CA	90638
Mark	Stowell	P.E.	Public Works Director/City Engineer		City of La Mirada	Public Works Department	La Mirada	CA	90638
Roy	Ramsland		Planning Manager		City of La Habra	Planning Division	La Habra	CA	90631
Elias	Saykali		Public Works Director		City of La Habra	Public Works Department	La Habra	CA	90631
David	Crabtree		Community Development Director		City of Brea	Community Development	Brea	CA	92821
Tony	Olmos		Public Works Director		City of Brea	Public Works Department	Brea	CA	92821
Joseph	Lambert		Director of Development Services		City of Placentia	Development Services Department	Placentia	CA	92870
Luis	Estevez		Acting Director of Public Works		City of Placentia	Public Works Department	Placentia	CA	92870
Jillian	Wong	PhD	Planning and Rules Manager		South Coast Air Quality Management District	Planning, Rules, & Development	Diamond Bar	CA	91765
Scott	Scambray	Ed.D.	Superintendent		Fullerton Joint Union High School Disitrct		Fullerton	CA	92833
Dr. Robert	Pletka		Superintendent		Fullerton School District		Fullerton	CA	92833
					Fullerton CA West Latter Day Saints Institute		Fullerton	CA	92832
Amy	Discher		Account Manager		Southern California Edison	Third Party Environmental Review	Rosemead	CA	91770
Jeff	Schenkelberg		Account Manager		So Cal Gas		San Dimas	CA	91773
STATE (Sent by OPR as indicated on SCH Notice of Completion)									
Ken	Alex		Director		State Clearinghouse	Governor's Office of Planning & Research	Sacramento	CA	95814
PROJECT SPONSORS and RESPONSIBLE AGENCIES									
Richard	Williams		District Director Facilities Planning & Construction		North Orange County Community College District		Anaheim	CA	92801-1819
Rodrigo	Garcia		Vice-President of Administrative Services		Fullerton College		Fullerton	CA	92832
Larry	Lara		Director of Physical Plant/Facilities		Fullerton College		Fullerton	CA	92832

# **APPENDIX B**

## *Biological Investigation*



October 17, 2016

9422

Mr. Richard Williams  
District Director, Facilities Planning and Construction  
North Orange County Community College District  
1830 W. Romneya Drive  
Anaheim, California 92801

***Subject: Biological Constraints Analysis for the Fullerton College Facilities Master Plan Project***

Dear Mr. Williams:

This letter presents the findings of a biological constraints analysis conducted by Dudek on the approximately 83-acre Fullerton College property located in the City of Fullerton, Orange County, California (project site; Figure 1). The project site is generally located south and west of North Berkeley Avenue, east of North Lemon Street, and north of East Wilshire Avenue (Figure 2).

The North Orange County Community College District (District) is updating its Facilities Master Plan for its Orange County campuses: Cypress College, Fullerton College, and its School of Continuing Education in Anaheim. The 2011 Facilities Master Plan provides an analysis of the evolving student body and makes planning recommendations based on educational needs. The District is undertaking a comprehensive improvement and building program to make the upgrades and repairs of existing buildings, to construct new facilities to improve the safety and educational experience of those attending the colleges, and to meet projected enrollment based on growth in population and jobs and the state Chancellor's Office enrollment projections in accordance with the Measure J Facilities Bond Program. Measure J was passed in November 2014 and issued \$574 million in bonds to fund upgrades to technical job training facilities, aging classrooms, and veterans' amenities.

At Fullerton College, the District plans to construct the following projects as part of the Facilities Master Plan (proposed project):

- A new Welcome Center at the corner of East Chapman Avenue and North Lemon Street
- Two new instructional buildings, one south of the 1400 building and one south of the proposed parking on lot on East Chapman Avenue



*Mr. Richard Williams*

*Subject: Biological Constraints Analysis for the Fullerton College Facilities Master Plan Project*

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- New Horticulture and Vocational Sciences Center
- New Child Development Center
- A new 840-space parking structure located west of Sherbeck Field and a pedestrian bridge from the parking structure to the Classroom Office 1400
- New parking lots north of Berkeley Avenue adjacent to the 3100 building and south of the Lemon Street parking structure
- Realignment of the campus access to the Centennial Parking Structure
- A new Maintenance and Operations facility located north of the chiller plant, a thermal storage addition to the south of the chiller plant, and an addition on the east side of the chiller plant
- New storage, offices, and a small shower/locker room building to the north of the existing pool
- The addition of field lighting and 4,500 stadium seats to Sherbeck Field
- A new Performing Arts complex, sculpture garden, arts plaza, and campus quad, in the south campus quad at the southeast corner of East Chapman Avenue and North Lemon Street with renovation of the existing Wilshire Theater
- Renovation of Physical Education 1200 facilities to include a third sand volleyball court and renovations to Health Services, faculty offices, and the Wellness Center
- Renovation of Math 600, Business 300, Humanities 500, Campus Services 840, Administration 100, and the Fine Arts Gallery 1000
- Renovation of Academic Computing 3100
- New signage at key entry and exit points of the campus such as the intersection of North Berkeley Avenue and North Lemon Street, along Berkeley Avenue at Lot 5, along Berkeley Avenue south of Sherbeck Field, along Berkeley Avenue at Lot B-2 East, along East Chapman Avenue at North Lawrence Avenue, at the intersection of East Chapman Avenue and North Lemon Street (north and south of the intersection), and along North Lemon Street at Lot C West

It is anticipated that these improvements will be phased over a 10-year period.

This letter report is intended to: (1) describe the existing conditions of biological resources within the project site in terms of vegetation, flora, wildlife, and wildlife habitats; (2) discuss potential constraints to development of the project site; and (3) provide recommendations for

avoidance of biological resources and additional actions that may be required for environmental permitting of the project with respect to biological resources.

## PROJECT SITE DESCRIPTION

The project site is an existing college campus with paved access roads, parking lots, buildings, and landscaped areas. Fullerton College is surrounded by urban residential and commercial uses in all directions. Fullerton High School is directly adjacent northwest of the campus along North Lemon Street.

Topography of the project site is generally flat with elevations ranging from approximately 175 feet above mean sea level at the center of campus to approximately 223 feet in the northern portion of campus. The project site can be found within Section 27, T. 3 S., R. 10 W. of the U.S. Geological Survey (USGS) 7.5-minute La Habra, California quadrangle map (Figure 2).

## METHODS

The biological constraints analysis began with a review of available literature and data to evaluate the environmental setting and identify potential special-status biological resources that may be found on the project site. The review included the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Data Base (CNDDB)<sup>1</sup>, U.S. Fish and Wildlife Service's (USFWS) Environmental Conservation Online System<sup>2</sup>, and California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants data (CNPS Inventory)<sup>3</sup>. A 5-mile buffer around the project site was queried in the USFWS data using geographic information systems (GIS) software, and a "nine-quad" query was conducted of the CNDDB and CNPS Inventory. The nine-quad query included the USGS 7.5-minute La Habra quadrangle and the surrounding eight USGS quadrangles (Anaheim, Baldwin Park, El Monte, Long Beach, Los Alamitos, Orange, San Dimas, Whittier, and Yorba Linda). These databases provided information regarding special-status plants, wildlife, and habitats recorded for the project site and vicinity. Dudek also reviewed soil survey maps<sup>4</sup>, USGS National Hydrography Dataset (NHD) of aquatic resources, USFWS' National

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<sup>1</sup> California Department of Fish and Wildlife. 2016. RareFind 5, Version 5.1.1. Biogeographic Data Branch. Sacramento, California: California Natural Diversity Database. Website <https://map.dfg.ca.gov/rarefind/view/RareFind.aspx> [accessed October 10, 2016].

<sup>2</sup> U.S. Fish and Wildlife Service. 2016. Environmental Conservation Online System, Information for Planning and Conservation Report (online edition, v2.3.2). Website <http://ecos.fws.gov/ipac/> [accessed October 10, 2016].

<sup>3</sup> California Native Plant Society, Rare Plant Program. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, California. Website <http://www.rareplants.cnps.org/> [accessed October 10, 2016].

<sup>4</sup> Wachtell, J.K. 1978. Soil Survey of Orange County and Western Part of Riverside County, California.

Mr. Richard Williams

*Subject: Biological Constraints Analysis for the Fullerton College Facilities Master Plan Project*

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Wetlands Inventory (NWI) maps<sup>5</sup>, and other in-house documentation, GIS layers, and sources for locations of special-status species and water resources.

On October 11, 2016, Dudek Arborist/Biologist Ryan Gilmore performed a general biological investigation of the project site, plus a 200-foot buffer totaling approximately 123.67 acres (study area). The purpose of the general survey was to identify vegetation communities and land covers, and identify potential habitat for any threatened, endangered, or otherwise special-status species that may occur within the study area. No focused, protocol-level surveys for plants or wildlife were conducted.

Vegetation community and land cover mapping was conducted according to the CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*<sup>6</sup> and *List of Vegetation Alliances and Associations*<sup>7</sup>, also referred to as the Natural Communities List. Vegetation communities and land covers were mapped in the field directly onto 1:2,400-scale (1 inch = 200 feet) aerial photographic maps. Non-natural vegetation communities or land covers not listed in the Natural Communities List followed generic habitat types used in the Orange County Habitat Classification System (OCHCS)<sup>8,9</sup>, and were identified as mapping units (e.g., Ornamental Mapping Unit). Following completion of the fieldwork, all vegetation polygons were digitized using ArcGIS and a GIS coverage was created.

During the field survey, a general inventory of plant and wildlife species detected by sight, calls, tracks, scat, or other signs was compiled; and the potential for special-status species to occur within the study area was determined. Observable special-status resources including perennial plants and conspicuous wildlife (e.g., birds and some reptiles) commonly accepted as regionally sensitive by the USFWS, CDFW, and/or CNPS were recorded and later digitized into a project-specific GIS coverage.

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<sup>5</sup> U.S. Fish and Wildlife Service. 2016. National Wetlands Inventory, Wetlands Mapper (online edition). Website <http://www.fws.gov/wetlands/Data/Mapper.html> [accessed October 13, 2016].

<sup>6</sup> California Department of Fish and Game. 2009. *Protocols for Surveying and Evaluating Impacts to Special-Status Native Populations and Natural Communities*. November 24. [http://www.dfg.ca.gov/wildlife/nongame/survey\\_monitor.html](http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html).

<sup>7</sup> California Department of Fish and Game. 2010. *List of Vegetation Alliances and Associations*. Natural Communities List, Vegetation Classification and Mapping Program. Sacramento, California: CDFG. September 2010. [http://www.dfg.ca.gov/biogeodata/vegcamp/natural\\_communities.asp](http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp).

<sup>8</sup> Gray, J., and D. Bramlet. 1992. Orange County Land Cover/Habitat Classification System Natural Resources Geographic Information System (GIS) Project. Prepared for the Orange County Environmental Management Agency.

<sup>9</sup> Jones & Stokes (Jones & Stokes Associates Inc.). 1993. *Methods Used to Survey the Vegetation of Orange County Parks and Open Space Areas and the Irvine Company Property*. JSA 92-032. Prepared for County of Orange, Environmental Management Agency, Environmental Planning Division, Santa Ana, California. Sacramento, California: Jones & Stokes. February 10, 1993.

In addition, a preliminary investigation of the extent and distribution of U.S. Army Corps of Engineers (ACOE) jurisdictional “waters of the U.S.,” Regional Water Quality Control Board (RWQCB) jurisdictional “waters of the State,” and CDFW jurisdictional streambed and associated riparian habitat was conducted.

## RESULTS

This section describes the soils, vegetation communities and floral diversity, wildlife diversity, and special-status biological resources. The study area does not occur within any established conservation plan boundaries such as a Natural Community Conservation Plan area or Habitat Conservation Plan area.

### Soil Survey Review

The *Soil Survey of Orange County and Western Part of Riverside County*<sup>10</sup> was analyzed for indicators of streams and the historic mapping of wetlands, seeps, springs, or hydric soils. Three soil series were identified as occurring within the boundaries of the study area: Mocho loam, 0 to 2% slopes (166); San Emigdio fine sandy loam, 0 to 2% slopes (194), and Xerorthents loamy, cut and fill areas, 9 to 15% slopes (219). One drainage feature was identified on the map that occurs approximately 0.12 miles west of the study area (Brea Creek).

### National Hydrography Dataset and National Wetlands Inventory Review

The study area occurs within the southeast portion of the Los Angeles-San Gabriel River Hydrologic Unit (805.00), and more specifically within the Anaheim Hydrologic Area Split (845.60) and Anaheim Hydrologic Subarea Split (845.61). The Los Angeles-San Gabriel River Hydrologic Unit includes covers most of Los Angeles County and is mostly fully developed and/or entitled. The Anaheim Hydrologic Subarea Split watershed is primarily drained by the Carbon Creek flood control channel and Moody Creek flood control channel, both of which connect with Coyote Creek and eventually merge with the San Gabriel River before eventually draining into the Pacific Ocean. No tributaries to Brea Creek channel occur within the study area. Brea Creek channel is identified as a “flowline” within the NHD and “blue-line” drainage on the USGS 7.5-minute La Habra and Anaheim quadrangle maps.

A review of the NWI dataset revealed no aquatic resources within the project site or surrounding study area.

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<sup>10</sup> Wachtell, J.K. 1978. *Soil Survey of Orange County and Western Part of Riverside County, California*.

## Vegetation Communities and Floral Diversity

Four non-natural land covers were mapped within the study area based on general physiognomy and species composition, including: developed, ornamental, ruderal, and transportation. These land cover types are described below and depicted within Figure 3. Table 1 summarizes the extent of each land cover within the study area.

**Table 1**  
**Vegetation Communities and Land Covers within the Study Area**

Vegetation Community or Land Cover	Area (acres)		
	Project Site	Off Site (200-foot Buffer)	Study Area
<i>Non-Natural Land Covers / Unvegetated Communities</i>			
Developed Mapping Unit	50.46	31.43	81.89
Ornamental Mapping Unit	18.52	5.99	24.51
Ruderal Mapping Unit	1.12	0.05	1.17
Transportation Mapping Unit	1.97	14.12	16.09
<b>Total</b>	<b>72.08</b>	<b>51.59</b>	<b>123.67</b>

### ***Non-Natural Land Covers/ Unvegetated Communities***

#### **Developed Mapping Unit**

The developed mapping unit includes areas occupied by college campus structures, residential and commercial structures, paving, and other impermeable surfaces that typically do not support vegetation or habitat for species; however, non-native ornamental landscaping may occur within the mapping unit.

#### **Ornamental Mapping Unit**

This land cover type consists of introduced plantings of exotic, and sometimes native, species as landscaping. Species associated with this mapping unit that occur within the study area include jacaranda (*Jacaranda mimosifolia*), fern pine (*Podocarpus gracilior*), camphor (*Cinnamomum camphora*), Canary Island pine (*Pinus canariensis*), sweetgum (*Liquidambar styraciflua*), Queen palm (*Syagrus romanzoffiana*), rosemary (*Rosmarinus officinalis*), Mexican fan palm (*Washingtonia robusta*), Bermuda grass (*Cynodon dactylon*), and various non-native ornamental grass species.

### **Ruderal Mapping Unit**

This land cover type consists of early successional grasslands dominated by non-native, pioneering herbaceous plants and associated with disturbed areas. The type of non-native species that dominate ruderal areas are generally forbs as opposed to grasses. Species associated with this mapping unit that occur within the study area include black mustard (*Brassica nigra*) and Russian thistle (*Salsola tragus*).

### **Transportation Mapping Unit**

This barren cover type consists of major paved vehicular access roads that lack vegetation. Roadways within the study area include East Chapman Avenue, North Lemon Street, North Berkeley Avenue, and East Wilshire Avenue.

### **Wildlife Diversity**

A limited number of wildlife species was observed or detected during the general field survey of the study area, including a total of 6 bird species. Bird species included American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). No raptors or active nests were observed during the site visit.

### **Special-Status Biological Resources**

The presence of protected or regulated vegetation communities, plant species, and wildlife species occurring or potentially occurring within the study area was based on a literature review and evaluation of the habitat found within the study area. Special-status biological resources are classified by either State or Federal resource management agencies, or both. Special-status vegetation communities include habitats considered "sensitive" by the CNDDDB that are unique, of relatively limited distribution, or of particular value to wildlife. Special-status plant and wildlife species include those listed as threatened or endangered under provisions of the State and federal Endangered Species Acts, or as California Species of Concern (SSC) by the CDFW. The species discussed below have been afforded special recognition by local, State, or federal resource conservation agencies and organizations, principally due to the species' declining or limited population sizes usually resulting from habitat loss.

### ***Sensitive Vegetation Communities***

No natural vegetation communities considered sensitive by the CNDDDB were identified within the study area.

### ***Special-Status Plants***

Special-status plants include those listed, or candidates for listing, as threatened or endangered by the USFWS and CDFW, and species identified as rare by the CNPS (particularly California Rare Plant Rank [CRPR] 1A – Presumed extinct in California; CRPR 1B – Rare, threatened, or endangered throughout its range; and CRPR 2 – Rare or Endangered in California, more common elsewhere). A total of 39 special-status plant species were reported in the CNDDDB, USFWS, and CNPS databases as occurring in the vicinity of the study area. However, no special-status plant species were observed within the study area during the site visit. Based on the species ranges, and land covers (e.g., developed, ornamental, ruderal, and transportation) and soils present on the project site, there is no potential for special-status plants to occur.

### ***Special-Status Wildlife***

Special-status wildlife include those listed, or candidates for listing, as threatened or endangered by the USFWS and CDFW, and designated as SSC by CDFW. A total of 50 special-status wildlife species were reported in the CNDDDB and USFWS databases as occurring in the vicinity of the study area. However, no special-status wildlife species were observed within the study area during the site visit. Based on the species ranges, and land covers (e.g., developed, ornamental, ruderal, and transportation) and urban pressures present on the project site, there is no potential for special-status wildlife to occur.

### ***Raptor Nesting and Foraging***

Since the study area is comprised of ornamental landscaping that support mature trees, there are limited nesting habitats for raptors. Foraging opportunities may occur outside the project site within the ruderal grassland areas. No raptor species were observed within the study area during the site visit.

Raptors that breed in wooded areas which may occur within the study area include American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginianus*). Other species that may over-winter or visit the study area include ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and sharp-shinned hawk (*Accipiter striatus*).

### ***Jurisdictional Aquatic Resources***

The project site does not support any aquatic resources regulated by the ACOE, or the CDFW as jurisdictional wetlands, “waters of the U.S.,” or “waters of the State.” No drainages were observed within the study area. The closest aquatic resource is Brea Creek (concrete box channel or wash) located 0.12 miles to the west at its closest approach.

### ***Public and Landmark Trees***

The City of Fullerton Municipal Code Chapter 9.06 Community Forestry states that no person shall injure, prune, or remove any public tree growing within the city public right-of-way (parkways, parks, and areas around public buildings) without a permit from the Director of Maintenance Services. Furthermore, no person shall injure, prune, or remove a landmark tree. Landmark trees are defined as any tree found to be of high value because of its species, size, age, or historic associations and have been designated by the City Council. Landmark trees are designated by the City and identified on maps filed in the Planning Department.

Dudek contacted the City on October 10, 2016 to determine the potential locations of landmark trees within the study area. The City stated that there are currently no official landmark trees as designated by the past or present City Council decree. Therefore, there are no landmark trees within the study area or project site.

The biologist observed a number of potentially regulated public trees growing within the parkways and medians on the following streets: East Chapman Avenue, North Lemon Street, East Wilshire Avenue, North Balcom Avenue, North Newell Place, and East Brookdale Place. Regulated public trees are depicted within Figure 4.

### ***Designated Critical Habitat***

No federally designated critical habitat for any plant or wildlife species occurs within the study area.

### ***Wildlife Corridors and Habitat Linkages***

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal.



No wildlife corridors or habitat linkages were identified near the study area. Given the extent of existing development north, east, south, and west of the project site and position between several busy vehicular thoroughfares, the study area is expected to support limited wildlife movement, and lacks intact connectivity to other major habitat reserve areas.

## **SUMMARY OF BIOLOGICAL CONSTRAINTS AND RECOMMENDATIONS**

The project site is an existing college campus characterized by non-natural land covers and unvegetated communities (e.g., developed and ornamental mapping units). Dudek understands that the proposed project involves renovation of existing structures and construction of new buildings and landscape features within the existing college campus footprint. For the purposes of this preliminary assessment, Dudek has assumed that standard best management practices during construction activities would be implemented and all future temporary and permanent impacts would occur within the existing development footprint.

Based on the results of the literature review and recent field observations conducted by Dudek, two potential biological resource constraints were identified for the proposed project:

- **Breeding and nesting bird habitat.** The project site and study area contain vegetation and trees that could potentially support breeding and nesting bird species, including raptors. Disturbing or destroying occupied nests, live young, and eggs is a violation of the Migratory Bird Treaty Act (16 U.S.C. 703) and California Fish and Game Code (Section 3503). Dudek recommends initiation of vegetation clearing outside the nesting season (February through August) in order to avoid impacting nesting birds. If construction activities must occur during the nesting season, then all suitable habitat should be thoroughly surveyed for the presence of nesting birds by a qualified biologist before commencement of any vegetation clearing. Typically, if an active nest is detected then an appropriate avoidance buffer around the nest, as determined by a qualified biologist, is flagged and avoided until the nesting cycle is complete.
- **Public Trees.** There are a large number of public trees located within the study area and regulated by the City of Fullerton. The City of Fullerton Municipal Code Chapter 9.06 Community Forestry requires a permit for activities that may alter, injure, or require the removal of a public tree.

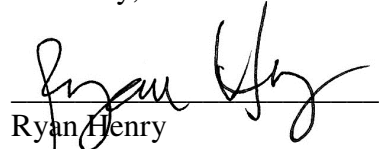
*Mr. Richard Williams*

*Subject: Biological Constraints Analysis for the Fullerton College Facilities Master  
Plan Project*

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If you have any question regarding the information provided within this letter report, please do not hesitate to contact me at 949.373.8321.

Sincerely,

A handwritten signature in black ink, appearing to read "Ryan Henry", is written over a horizontal line.

Ryan Henry  
Senior Biologist/Project Manager

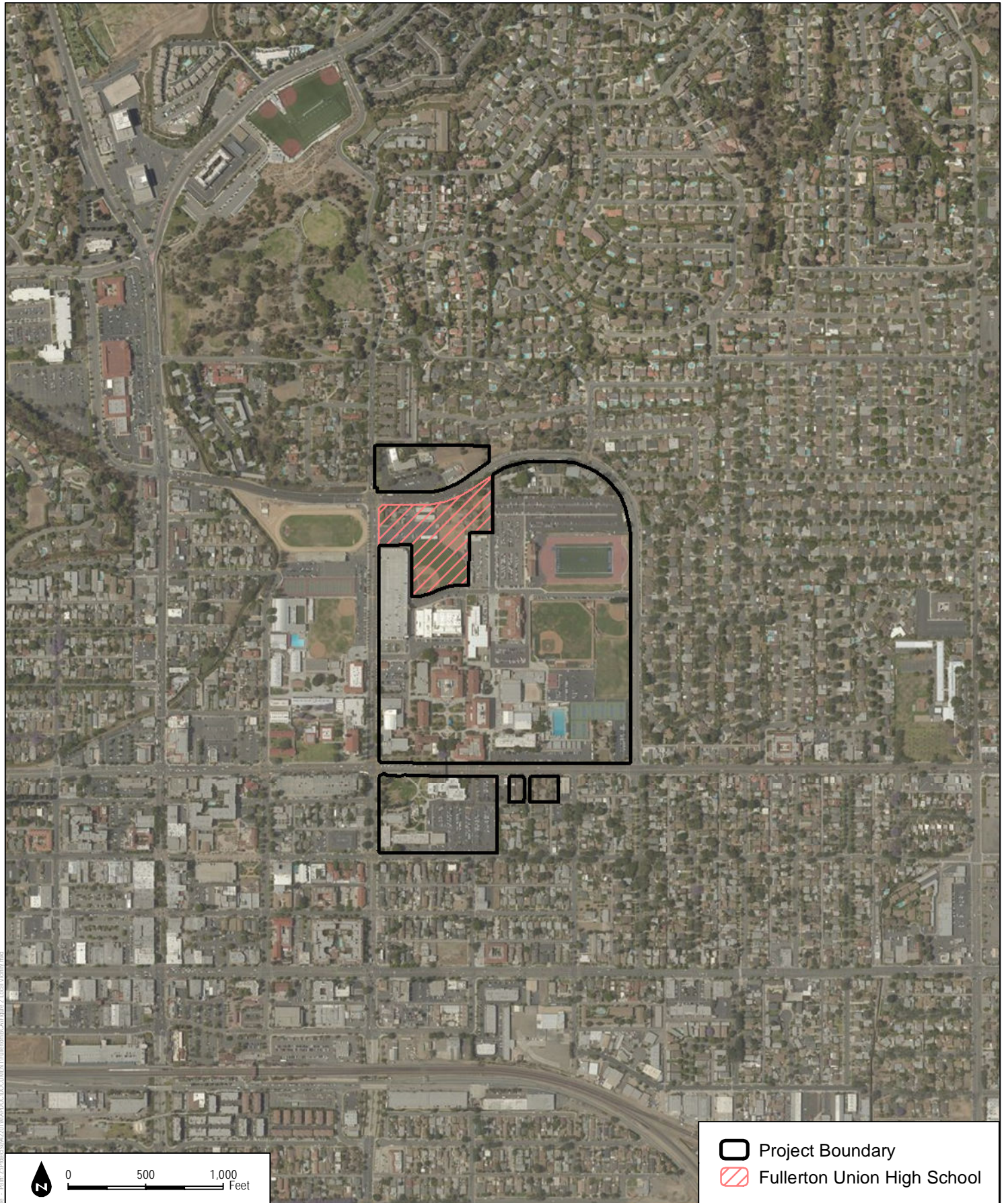
*Att.: Figures 1–4*



*cc: Rachel Struglia, Dudek*







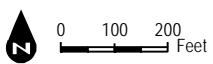
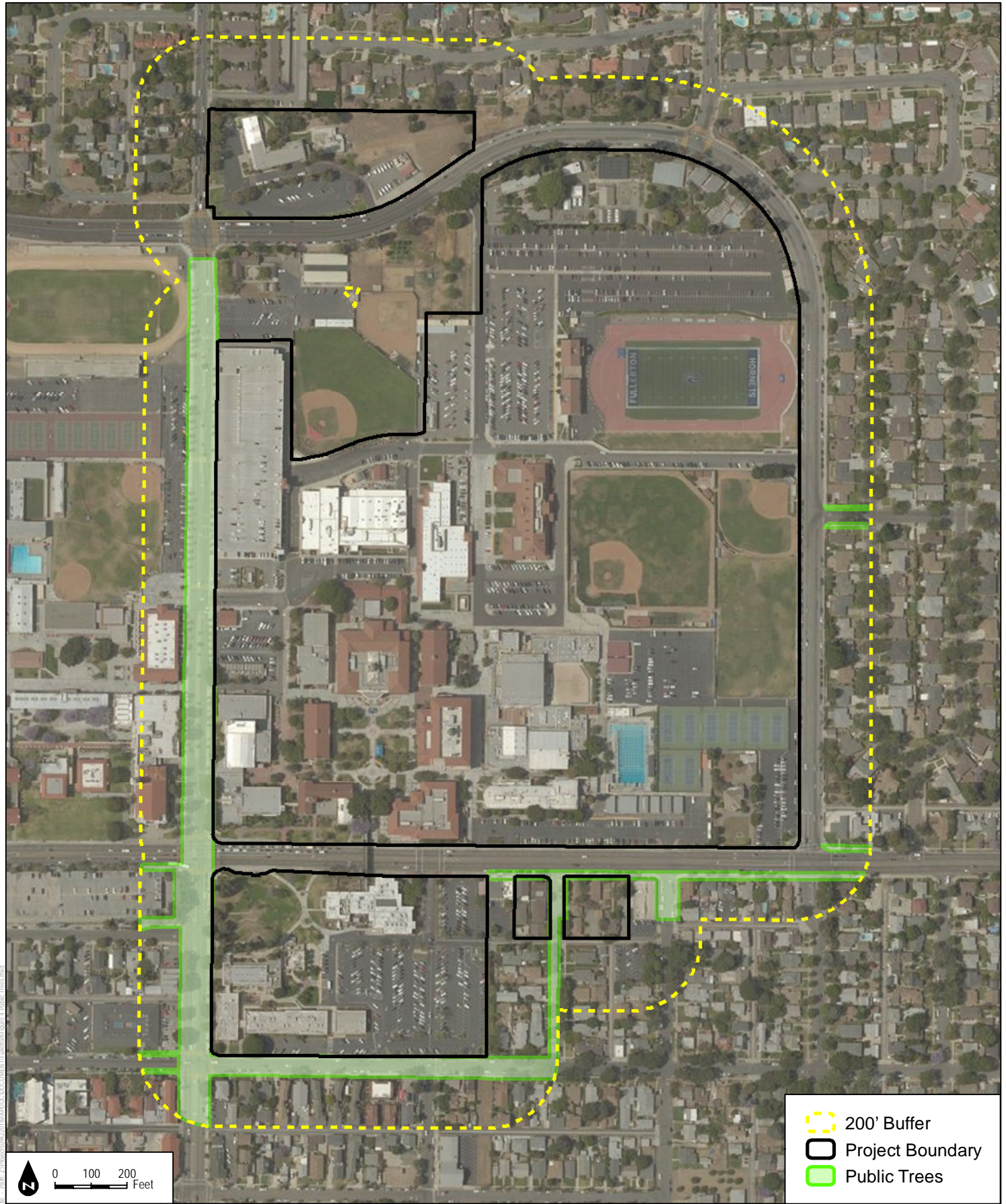


-  Project Boundary
-  Fullerton Union High School









- 200' Buffer
- Project Boundary
- Public Trees

SOURCE: SOURCE: Bing Maps, 2016

**FIGURE 4**  
Public Trees

# **APPENDIX C**

## *Cultural Resources Report*





**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR,  
City of Fullerton, Orange County, California**

*Prepared for:*

**North Orange County Community College District**

1830A West Romneya Drive

Anaheim, California 92801

*Contact: Richard Williams, District Director Facilities Planning and Construction*

*Prepared by:*

Sarah Corder, MFA; Samantha Murray, MA; Kara R. Dotter, MSHP;  
and Adriane Dorrlor

**DUDEK**

38 North Marengo Avenue

Pasadena, California 91101

**AUGUST 2017**



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page No.</u></b>
ACRONYMS AND ABBREVIATIONS.....	IX
EXECUTIVE SUMMARY .....	XI
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 Project Location .....	1
1.2 Project Description.....	1
1.2.1 Introduction.....	1
1.2.2 Facilities Master Plan Elements.....	2
1.3 Regulatory Setting .....	21
1.3.1 Federal.....	22
1.3.2 State.....	23
1.3.3 Local .....	27
<b>2 BACKGROUND RESEARCH.....</b>	<b>31</b>
2.1 CHRIS Records Search.....	31
2.1.1 Previously Conducted Cultural Resources Studies.....	31
2.1.2 Previously Recorded Cultural Resources.....	33
2.2 Native American Coordination .....	37
2.3 Building Development Research .....	38
<b>3 HISTORIC CONTEXT.....</b>	<b>39</b>
3.1 City of Fullerton Historical Overview .....	41
3.2 Fullerton College Historical Overview .....	43
3.2.1 Fullerton College Beginnings .....	43
3.2.2 The Great Depression and World War II.....	44
3.2.3 Postwar Expansion on Campus.....	45
3.2.4 Politics and Social Change.....	47
3.2.5 Economic Uncertainty .....	47
3.2.6 Diversity and Expansion .....	48
3.3 Campus Development and Expansion .....	48
3.3.1 Original Campus Master Plan (1935–1942) .....	48
3.3.2 Taylor and Conner’s Campus Expansion Master Plan (1953–1965).....	58
3.3.3 Blurock’s Campus Expansion Projects (1965–1984) .....	69
3.3.4 Chapman and Wilshire School Acquisition (1980–1984) .....	72
3.3.5 Chapman Avenue Residential Acquisitions (1980s, 1990s).....	76

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

---

**TABLE OF CONTENTS (CONTINUED)**

<b><u>Section</u></b>	<b><u>Page No.</u></b>
3.4 Campus Architectural Styles.....	76
3.4.1 Spanish Colonial Revival (1915–1940) .....	76
3.4.2 Craftsman (1905–1930) .....	78
3.4.3 PWA/WPA Moderne (1933–1944).....	80
3.4.4 Mid-Century Modern (1933–1965) .....	80
3.4.5 New Formalism (1954–1970s) .....	82
3.4.6 International Style (c. 1925–present).....	83
3.5 Campus Architects .....	84
3.5.1 Harry K. Vaughn (1882–1962) .....	84
3.5.2 Ralph D. Cornell (1890–1972) .....	85
3.5.3 Donald Beach Kirby, Architect (1905–1980).....	85
3.5.4 William Henry Taylor, Architect (1912–1995) .....	86
3.5.5 William E. Blurock, Architect (1922–2012).....	87
<b>4 CULTURAL RESOURCES SURVEY .....</b>	<b>89</b>
4.1 Methods.....	89
4.2 Description of Surveyed Resources .....	89
<b>5 SIGNIFICANCE EVALUATIONS.....</b>	<b>111</b>
5.1 Fullerton Junior College Campus Historic District .....	111
5.1.1 NRHP/CRHR Evaluation Criteria .....	117
5.1.2 Local Evaluation Criteria .....	120
5.1.3 Integrity Considerations.....	121
5.1.4 Conclusions.....	123
5.2 Mid-Century Modern Campus Expansion Historic District .....	124
5.2.1 NRHP/CRHR Evaluation Criteria .....	127
5.2.2 Local Evaluation Criteria .....	130
5.2.3 Integrity Considerations.....	131
5.2.4 Conclusions.....	132
5.3 Wilshire Junior High School Historic District.....	133
5.3.1 NRHP/CRHR Evaluation Criteria .....	134
5.3.2 Local Evaluation Criteria .....	138
5.3.3 Integrity Considerations.....	138
5.3.4 Conclusions.....	140
5.4 325–327 North Newell Place .....	141
5.4.1 NRHP/CRHR Evaluation Criteria .....	141

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

---

**TABLE OF CONTENTS (CONTINUED)**

<b><u>Section</u></b>	<b><u>Page No.</u></b>
5.4.2 Local Evaluation Criteria.....	143
5.4.3 Integrity Considerations.....	144
5.4.4 Conclusions.....	145
5.5 420 East Chapman Avenue.....	145
5.5.1 NRHP/CRHR Evaluation Criteria .....	145
5.5.2 Local Evaluation Criteria.....	147
5.5.3 Integrity Considerations.....	149
5.5.4 Conclusions.....	150
5.6 416 East Chapman Avenue.....	150
5.6.1 NRHP/CRHR Evaluation Criteria .....	150
5.6.2 Local Evaluation Criteria.....	152
5.6.3 Integrity Considerations.....	154
5.6.4 Conclusions.....	154
5.7 418 East Chapman Avenue.....	155
5.7.1 NRHP/CRHR Evaluation Criteria .....	155
5.7.2 Local Evaluation Criteria.....	157
5.7.3 Integrity Considerations.....	159
5.7.4 Conclusions.....	159
5.8 409 North Newell Place.....	159
5.8.1 NRHP/CRHR Evaluation Criteria .....	159
5.8.2 Local Evaluation Criteria.....	162
5.8.3 Integrity Considerations.....	163
5.8.4 Conclusions.....	164
5.9 428, 434, and 438 East Chapman Avenue .....	164
<b>6 IMPACTS ANALYSIS.....</b>	<b>165</b>
6.1 Proposed Demolition .....	171
6.2 Proposed Renovations.....	172
6.2.1 Interior Renovations.....	172
6.2.2 ADA Compliance Renovations (Interior and Exterior) .....	173
6.2.3 Exterior Renovations .....	173
6.3 Proposed New Construction .....	174
6.4 Site Improvement Elements.....	175
6.4.1 Parking/Vehicular Entry Improvements .....	175

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

---

## TABLE OF CONTENTS (CONTINUED)

<b><u>Section</u></b>	<b><u>Page No.</u></b>
6.4.2 Pedestrian Circulation.....	176
6.4.3 Infrastructure Improvements.....	176
6.5 Recommended Mitigation.....	176
<b>7 SUMMARY AND MANAGEMENT RECOMMENDATIONS .....</b>	<b>179</b>
7.1 Summary of Findings.....	179
7.1.1 Built Environment.....	179
7.1.2 Archaeology.....	180
7.2 Management Recommendations.....	180
7.2.1 Built Environment Resources .....	180
7.2.3 Archaeological Resources.....	180
<b>8 REFERENCES.....</b>	<b>183</b>

## APPENDICES

A	Records Search Results
B	NAHC and Native American Coordination
C	Preparers' Qualifications

## TABLES

1	Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site .....	31
2	Previously Recorded Cultural Resources within 0.5 Miles of the Project Site .....	34
3	Fullerton College Campus Buildings and Structures Surveyed.....	90
4	Inventory of Buildings within the Potential Fullerton Junior College Campus Historic District.....	112
5	Inventory of Buildings within the Potential Mid-Century Modern Campus Expansion Historic District.....	124
6	Inventory of Buildings within the Potential Wilshire Junior High School Historic District.....	133
7	Summary of Impacts and Mitigation .....	165

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

---

## TABLE OF CONTENTS (CONTINUED)

### Page No.

### FIGURES

1	Regional Map.....	3
2	Local Vicinity Map.....	5
3	Existing Campus Land Uses.....	7
4	Proposed Campus Land Uses.....	9
5	Proposed Demolition .....	17
6	Vaughn’s preliminary campus plan .....	50
7	Aerial photograph from 1940 showing the FJC Campus and Vaughn’s many accomplishments during his time with FJC (Richey et al. 2012) .....	51
8	1939 photo of Commerce building .....	52
9	Administration and Social Sciences building constructed in 1938.....	53
10	Technical Trades building constructed in 1937 .....	54
11	Interior of Greenhouse, c. 1937 .....	55
12	Student Union building under construction in 1939 .....	56
13	1940 Aerial photograph showing the second phase of construction on the Student Union building.....	57
14	T Shacks used for classroom spaces starting in 1946.....	58
15	Science building, 1955.....	60
16	Gymnasium building constructed in 1955 .....	61
17	Library constructed in 1957 and demolished in 2003.....	62
18	Student Center constructed in 1957 and demolished in 2007.....	63
19	Technical Education building constructed in 1959.....	64
20	Art–Home Economics building view from top of Gymnasium.....	65
21	District Administration building constructed in 1960 .....	66
22	Applied Arts building constructed in 1962.....	67
23	Music building constructed in 1967.....	68
24	Theatre building constructed in 1967 .....	69
25	Child Development Center Complex.....	70
26	Math Audio–Tutorial building constructed c. 1970.....	71
27	Pedestrian Bridge and Student Center constructed in 1984.....	72
28	1938 Aerial photograph looking southeast, showing the Wilshire School buildings (circled) to the south of the FJC Campus and Fullerton Union High School campus .....	74
29	Wilshire Theatre.....	75



Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR

---

TABLE OF CONTENTS (CONTINUED)

	<u>Page No.</u>
30 Wilshire School Building 1.....	75
31 Overview of Historic Districts on Campus.....	113
32 Fullerton Junior College Campus Historic District .....	115
33 Mid-Century Modern Campus Expansion Historic District .....	125
34 Wilshire Junior High School Historic District.....	135

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ADA	Americans with Disabilities Act
AIA	American Institute of Architects
ASF	assignable square feet
CEQA	California Environmental Quality Act
CFBD	City of Fullerton Development Services Department Building Division
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
FHA	Federal Housing Administration
FJC	Fullerton Junior College
GSF	gross square feet
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
PRC	California Public Resources Code
Program EIR	Program Environmental Impact Report
PWA	Public Works Administration
SCCIC	South Central Coastal Information Center
WPA	Works Progress Administration
WWII	World War II

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# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## EXECUTIVE SUMMARY

Dudek was retained by the North Orange County Community College District (District) to conduct a cultural resources study for the Fullerton College Facilities Master Plan (proposed project) Program Environmental Impact Report (EIR).

The cultural resources study included a records search of the proposed project site plus a 0.5-mile radius; Native American coordination; a pedestrian survey of the project site for cultural resources; archival and building development research for buildings located within the project site; evaluation of buildings for the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and City of Fullerton historical landmark eligibility criteria and integrity requirements; and an assessment of impacts to historical resources in compliance with the California Environmental Quality Act (CEQA).

All buildings and structures on campus that were built at least 45 years ago or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA.

As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area:

- **Fullerton Junior College Campus Historic District.** The original 1930s–1940s Fullerton Junior College Campus appears to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3, as well as City of Fullerton historical landmark criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style with Churrigueresque elements. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district’s period of significance (1935–1942).
- **Mid-Century Modern Campus Expansion Historic District.** The buildings designed by William Henry Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect Taylor.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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- **Music Building 1100.** This building appears eligible as both a district contributor (of the Mid-Century Modern Campus Expansion Historic District) and an individual property under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, 7, 8, and 9, for its high artistic value associated with the New Formalism style and for its location prominently anchoring the southwest corner of campus.
- **Wilshire Junior High School Historic District.** The original 1936 Wilshire Junior High School campus buildings appear to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3 and City of Fullerton historical landmark criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose best-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke's School in San Francisco.

These findings indicate that Fullerton College contains numerous buildings that are considered historical resources under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided.

No archaeological resources were identified within the project site as a result of the records search or Native American coordination. However, it is always possible that intact archaeological deposits are present at subsurface levels. For these reasons, the project site should be treated as potentially sensitive for archaeological resources. Management recommendations to reduce potential impacts to unanticipated archaeological resources and human remains during campus construction activities are provided.

# **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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## **1 INTRODUCTION**

Dudek was retained by the North Orange County Community College District (District) to conduct a cultural resources study for the proposed Fullerton College Facilities Master Plan (proposed project) Program Environmental Impact Report (EIR). The cultural resources study includes the following components: (1) a California Historical Resources Information System (CHRIS) records search covering the proposed project site plus a 0.5-mile radius, (2) a review of the California Native American Heritage Commission's (NAHC's) Sacred Lands File, (3) outreach with local Native American tribes/groups identified by the NAHC to collect any information they may have concerning cultural resources, (4) a pedestrian survey of the project site for cultural resources, (5) archival and building development research for buildings located within the project site, (6) the evaluation of buildings for California Register of Historical Resources (CRHR) eligibility, and (7) consideration of impacts to historical resources in compliance with the California Environmental Quality Act (CEQA).

This report was prepared by Dudek Architectural Historians Sarah Corder, MFA, Samantha Murray, MA, and Kara Dotter, MSHP, all of whom exceed the Secretary of the Interior's Professional Qualification Standards for architectural history (see resumes provided in Appendix C).

### **1.1 Project Location**

Fullerton College is located at 321 East Chapman Avenue in the City of Fullerton (City) and occupies an approximately 70-acre site in northern Orange County (Figure 1). The project site is discontiguous and includes the entire Fullerton College Campus north of Chapman Avenue between Lemon Street to the west and Berkeley Avenue to the east; the Wilshire Center School of Continuing Education to the south (located on the northeast corner of Lemon Street and Wilshire Avenue); and residential properties located south of Chapman Avenue, including 416, 418, 420, 428, 434, and 438 East Chapman Avenue, and 325–327 and 409 North Newell Place (Figure 2).

### **1.2 Project Description**

#### **1.2.1 Introduction**

The District is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings and to construct new facilities to improve the safety and educational experience of those attending Cypress College, Fullerton College, Anaheim Campus, and the School of Continuing Education in accordance with Measure J. In 2014, voters passed a \$574 million Measure J Facilities/Bond Program. The Measure J Bond Program will help make upgrades to lecture halls, technology, and instructional equipment to better prepare

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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students for growing fields of study and high-skill careers for all District campuses. It also allows the District to enhance classroom space and training centers. It will allow the District to expand veterans' services, as well as job placement centers to train and retrain veterans as they transition into the civilian workforce (District 2016a).

Fullerton College is proposing to implement the proposed project to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond while constructing and renovating facilities to meet the District's instructional needs. Improved circulation in and around campus would increase accessibility to existing and new development and enhance the overall connectivity of campus uses.

### **1.2.2 Facilities Master Plan Elements**

#### **1.2.2.1 New Construction**

Based on the information in the *Proposed Facilities Master Plan Updates* (District 2016b), the projects in the following text have detailed information available and would receive project-level assessment. See Figure 3 for existing campus land uses and Figure 4 for proposed campus land uses. All construction projects would be funded by Measure J, with the exception of the Aquatics Center expansion.

#### **Welcome Center**

The proposed Welcome Center would be northeast of the East Chapman Avenue and North Lemon Street intersection to make it accessible and visible to students, visitors, and the community. The Welcome Center would be three stories tall and 29,470 assignable square feet (ASF; 44,000 gross square feet (GSF)) and would include a Veterans Resource Center and space for student services.

#### **New Instructional Building**

This building would be between the Classroom office 1400 and Physical Education 1200. The new instructional building would be three stories tall and 47,900 ASF (72,400 GSF) and would include classrooms, faculty offices, and support spaces.





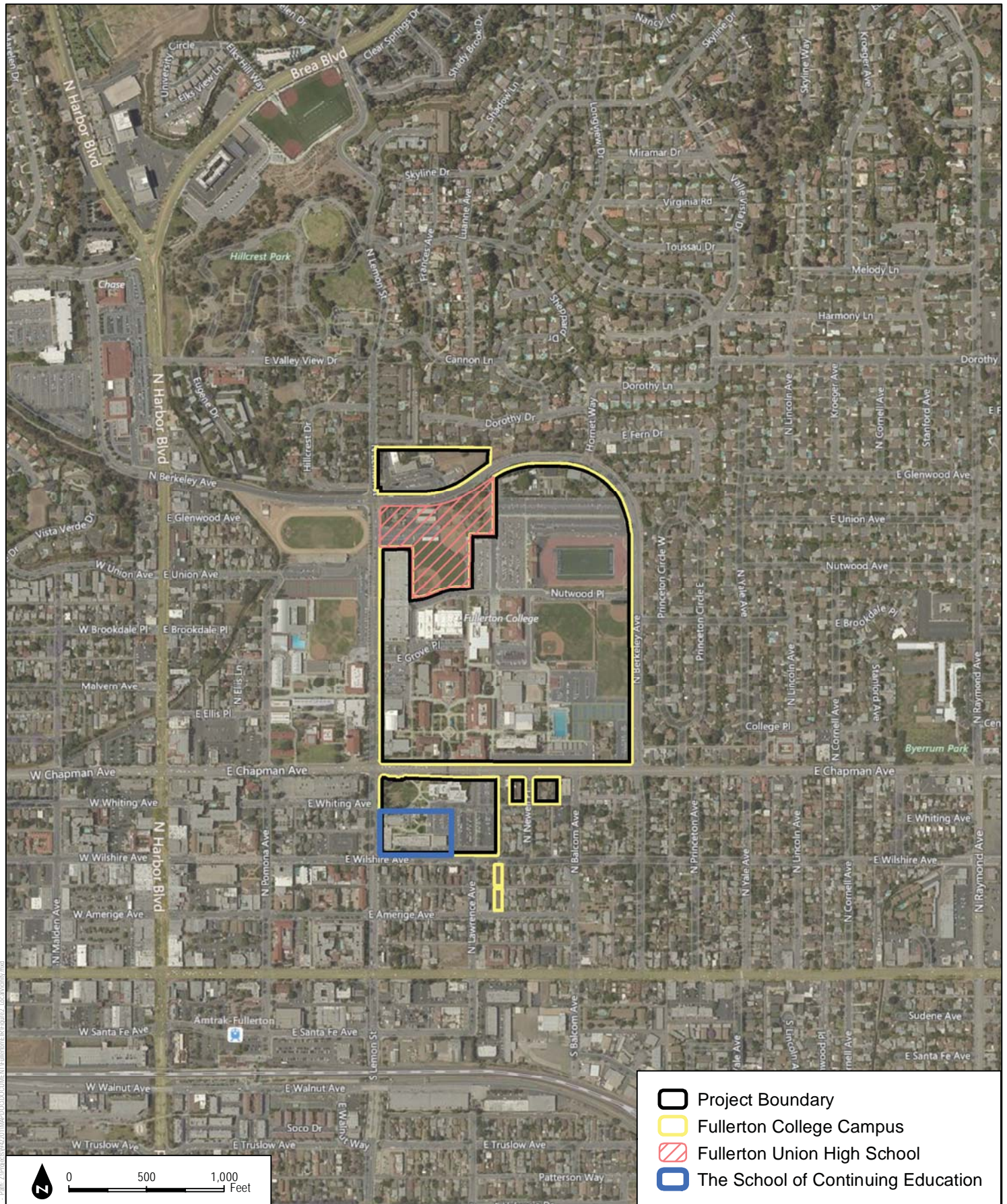
**FIGURE 1**  
**Regional Map**



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Fullerton College Facilities Master Plan Program EIR**

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SOURCE: Bing Maps, 2016

**DUDEK**

Fullerton College Facilities Master Plan Program Environmental Impact Report

**FIGURE 2**  
**Local Vicinity Map**

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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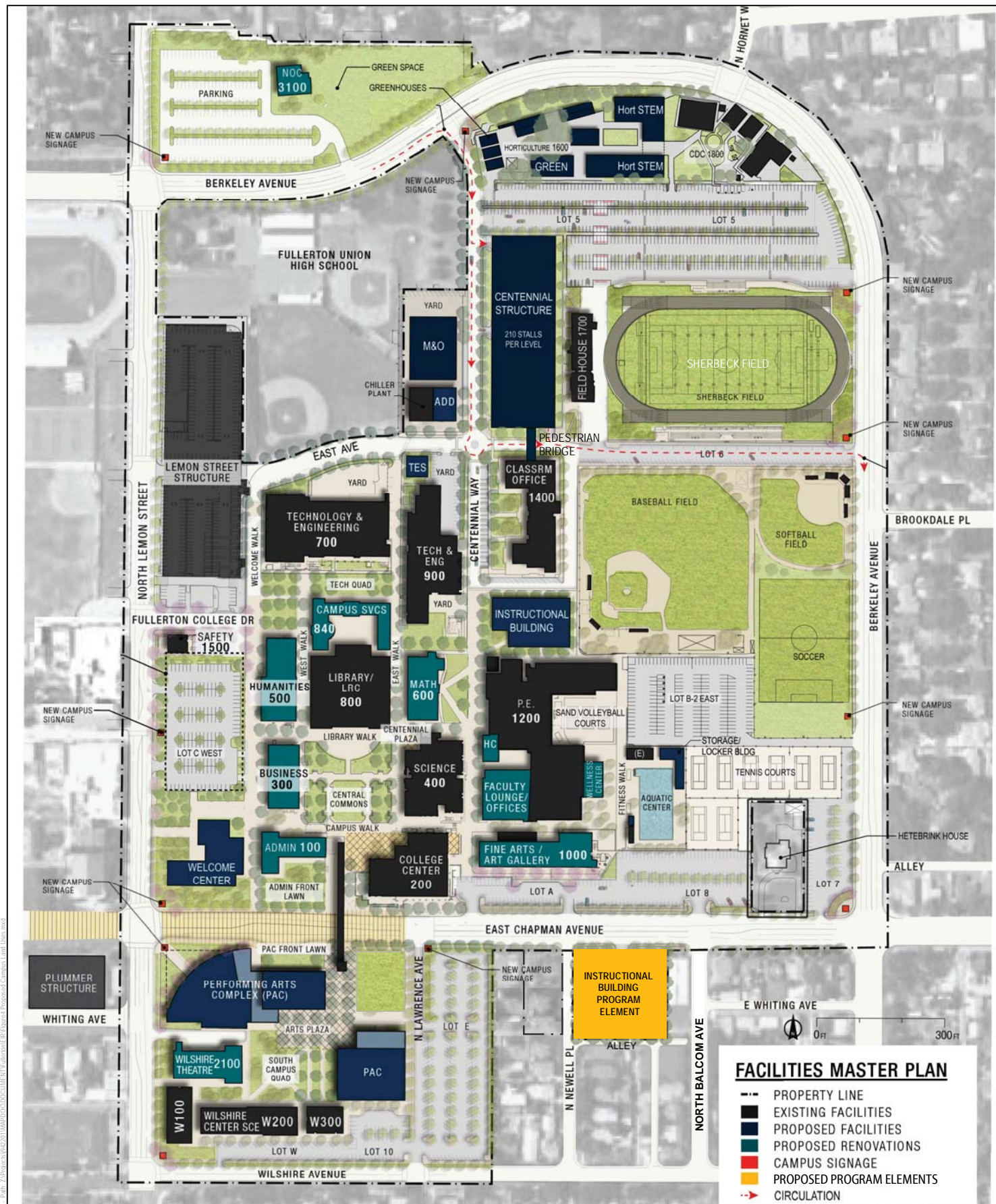


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## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Horticulture and Vocational Services Center**

The Horticulture and Vocational Services Center would be in the northeastern portion of the campus (where the existing Horticulture buildings are currently located). New greenhouses would be constructed along with an instructional facility that will include lecture space and lab space for the Biotechnical program and kitchen facilities for the Food/Nutrition program. The new facilities would total 26,900ASF (32,300 GSF), and each facility would be one story in height.

The Lab School facility would replace the existing 1810, 1820, and 1830 buildings, located in the northeastern corner of campus, east of the Horticulture 1600 buildings. The Lab School would provide classroom and support space for the Child Development program. The building would be one story tall and 6,271 ASF (7,427 GSF).

### **Centennial Parking Structure**

The proposed project would consist of a new four-level parking structure planned west of Sherbeck Field. The parking structure would provide 840 parking spaces and would be 300 ASF (260,000 GSF). A digital display would be located at the entrance of the parking structure, which would show the number of parking spaces available or if the parking structure is full. Ingress and egress from the structure is described more fully under “Realignment of Campus Access to the Centennial Parking Structure.”

### **Pedestrian Bridge**

A new pedestrian bridge would span 60 feet across East Avenue and would connect to the second floor of the parking structure and Building 1400.

### **Realignment of Campus Access to the Centennial Parking Structure**

The proposed project would also involve the realignment of the primary one-way access from Berkeley Avenue (north) to the proposed structure and then from the structure to Berkeley Avenue (east). This would also involve the construction of a new south driveway to the new Centennial parking structure and a roundabout at the intersection of East Avenue and Centennial Way. The new realignment would limit vehicle entry from the eastern side of the parking structure and vehicle exit south of the parking structure, which would limit one-way traffic along East Avenue and Centennial Way.

### **New Parking Lots**

New parking lots are proposed throughout the campus. The Berkeley Center lot, located north of Berkeley Avenue, will be introduced upon demolition of the Berkeley 3000 building. Lot C West, located south of the Lemon Street Structure and the Safety 1500 building, will be significantly



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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expanded after the demolition of the Theatre Arts 1300 building. Lot 11 will be introduced after the removal of 428, 434, and 438 East Chapman Avenue and 400 North Newell Place.

### **New Maintenance and Operations Facility, Chiller Plant Addition, and Thermal Energy Storage**

The new Maintenance and Operations facility would be located west of the Centennial Parking Structure and north of the chiller plant. The Maintenance and Operations facility would be two stories tall and 13,200 ASF (22,300 GSF). The Maintenance and Operations facility would provide administration offices, trade work areas, and support functions.

The chiller plant addition would be one story tall and 1,600 square feet and would be required to accommodate additional facilities as part of the proposed project. The chiller plant addition would include a circulation pump, condenser water pump, and a cooling tower and would require the addition of underground piping to the thermal energy storage tank.

The thermal energy storage tank would be located south of the chiller plant. A one-story-tall, 3,900-square-foot building would encase the tank.

### **Aquatics Center**

Improvements to the Aquatics Center, located east of the Physical Education Building 1200, would include deck storage, a small shower/locker room, and two classrooms added to the north of the existing pool. These facilities would total 1,800 ASF (3,500 GSF) and would be one story tall.

### **New Performing Arts Complex**

The Performing Arts Complex is a replacement building complex that would define the south campus quad, and includes renovation of the historic Wilshire Theatre. The Performing Arts Complex auditorium would include an 80-foot-tall fly loft and total 25,658 ASF (40,300 GSF). The Performing Arts Complex would serve to replace the Theatre Arts 1300, the Music building 1100, and the TV/Radio program currently held in Building 2000. The Performing Arts Complex would host theatre and music events. The Theatre Arts 1300 and the Music Building 1100 currently offer 150 and 694 seats, respectively. Therefore, the new Performing Arts Complex would offer 844 seats. The Performing Arts Complex could also be used by other schools and entities. The Performing Arts Complex would also include support space, laboratories, and classrooms in a separate two-story building.

### **Chapman–Newell Instructional Building**

The new instructional building would be two stories tall and 35,200 ASF (54,600 GSF) and would include classrooms, faculty offices, and support spaces.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.2.2.2 Renovation**

Based on the information in the *Proposed Facilities Master Plan Updates* (District 2016b), the projects in the following text have detailed information available and would receive project-level assessment. See Figure 3 for existing campus land uses and Figure 4 for proposed campus land uses. All renovation projects would be funded in part or in totality by Measure J. Renovation of the Business 300 and Humanities 500 buildings will be funded in part by Measure J and also through state funding. State funding is also being considered for renovation of the Math 600 building and the Performing Arts Complex.

Due to the age and condition of the existing buildings, the Facilities Master Plan emphasizes renovation and modernization of existing facilities. The goals of the proposed renovations are to maximize educational space and improve efficiency/utilization of existing facilities. Building renovations could include new energy-efficient lighting, ceilings, flooring, casework, elevators, ADA access, ADA-compliant restrooms, stairwells, and heating, ventilation, and air conditioning systems. Figure 4 shows which facilities are planned for renovation.

#### **Math Building 600**

Math Building 600 is located in the center of the campus, south of the Technology and Engineering Building 900. Upon renovation, the building would continue to provide classrooms and the Mathematics and Computer Science Division office.

Renovations to the Math Building 600 would primarily consist of interior finishes, including installation of a new HVAC system and electrical modifications. Fenestrations would also be incorporated into the exterior walls to allow for better air intake. The bathrooms would be remodeled to meet ADA standards. Additionally, the handrails located in the exterior stairwells would need to be replaced to meet ADA standards. Other ADA renovations would be required to allow access for the visually impaired.

The Math Lab and support spaces, which have been vacated, would be converted to classrooms and offices. A new hallway would be added to provide appropriate exiting from the building. Technology upgrades would be required to meet the needs of faculty and students. Reconfiguration of the interior space would be required to create a Math Skills Center with computer stations, whiteboards, work tables, and study rooms. Renovations would also be required to grant students easier access to faculty offices and to create space for students and faculty to meet.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Physical Education Building 1200 – Wellness Center, Faculty Offices, and Health Center**

Physical Education Building 1200 is located in the center of campus, north of the Fine Arts Gallery Building 1000. The Wellness Center, faculty offices, and Health Center are located in the eastern wing, southwestern wing, and western wing, respectively, of Physical Education Building 1200. Upon renovation of the Wellness Center and the Health Center, the buildings would continue to provide space for clinical and psychological services for Fullerton College students. The faculty offices would continue to provide office space for faculty members.

The Wellness Center and Health Center could require relocation to the new Welcome Center, and the remaining areas of the facilities would require interior renovations. Renovations would include the reconfiguration of space to support program needs; upgrade of technology infrastructure; upgrade of building systems, such as mechanical, electrical, plumbing, and structural; increase of restroom capacity to meet current codes; and upgrade of access throughout the building to meet current ADA compliance.

### **Wilshire Theatre Building 2100**

Wilshire Theatre Building 2100 is located in the southwestern corner of campus, south of East Chapman Avenue and north of Wilshire Avenue. Wilshire Theatre Building 2100 would require renovation to serve as a 400-seat concert hall. Renovations would include improved lighting, updated electrical systems, structural reinforcements to support new rigging, and improved backstage support areas. Currently, the second story is not wheelchair accessible. Upon renovation, all areas of the theater would be universally accessible. Remodeled restrooms, theater access, and stage access redesign would also be required to comply with ADA standards. The theater would also require redesign to provide a designated box office.

### **Business Building 300**

Business Building 300 is located in the southwestern portion of campus, south of the Humanities Building 500. Upon renovation, the building would continue to provide classrooms and study space to support the Business program and the Business and Computer Information Systems Division office. Renovations would include a reorganization and modernization of instructional space; remodel and reuse of vacant spaces; upgrades to provide modern instructional technology infrastructure; an increase in restroom capacity to comply with current codes; reconstruction of existing stairs and construction of new stairs and ramps to comply with current codes; replacement of mechanical, electrical, plumbing, telecommunication, and structural systems; retrofits to achieve an exceedance of Title 24 energy requirements by 15%; and hazardous materials abatement.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Specifically, the interior and exterior of the eastern and western entrances would need to be remodeled and ramps would need to be installed to meet ADA requirements. Openings would also be incorporated into the exterior walls to allow for better air intake. New louvers would be installed throughout the exterior of the building.

### **Humanities Building 500**

Humanities Building 500 is located in the southwestern portion of campus, west of the Library/Learning Resources Center Building 800. Upon renovation, the building would provide classrooms and study space to support the Humanities program, the Humanities Division office, and could support the Veterans Resource Center. Renovations would include a reorganization and modernization of instructional space; remodel and reuse of vacant spaces; updates to provide modern instructional technology infrastructure; an increase in restroom capacity to comply with current codes; reconstruction and construction of new stairs and ramps to comply with current codes; replacement of mechanical, electrical, plumbing, telecommunication, and structural systems; retrofits to achieve an exceedance of Title 25 energy requirements by 15%; and hazardous materials abatement.

A board-formed finish would be applied to the exterior of the building, and tiles would be installed on the roof to appear consistent with the 1930s-era buildings on campus.

These renovations would provide current technology hardware and software and hybrid and flexible classroom and lab space. Additionally, the Veterans Resource Center could require renovations to accommodate the anticipated increase in veteran students. The Assessment Center requires a lab to support 50 students for testing purposes.

### **Campus Services Building 840**

Campus Services Building 840 is located in the western portion of campus, north of Library–Learning Resources Center Building 800. Upon renovation, the Campus Services Building 840 would continue to provide Disability Support Services for students, the mailroom, and a café. Renovations would include the reprogramming of vacant space and the addition of a testing space for students. Doorway modifications would be required to ensure ADA compliance.

### **Administration Building 100**

Administration Building 100 is located in the southwestern portion of campus, south of the Business Building 300. The student services functions currently located in Administration Building 100 would be relocated in the new Welcome Center. Administration Building 100 would be reprogrammed and reconfigured to support Fullerton College’s administrative functions.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Renovation would include the demolition of the 1957 addition and restoration of the original entrance tower that was built in the 1930s. The Financial Aid Office would be reconfigured to create queuing space for students; space to accommodate staff in private work locations; a private office for the Director of Financial Aid attached or adjacent to the Financial Aid Office; space for intake, including a lowered counter space to accommodate students with mobility impairments; confidential space for intake; and a secured file room to comply with federal record-keeping requirements.

Renovations to the entrance and basement would be required to correct access issues.

### **Fine Arts Gallery Building 1000**

Fine Arts Gallery Building 1000 is located in the southern portion of campus, south of Physical Education Building 1200. The building would continue to provide gallery space and classrooms for the Fine Arts program upon renovation. Renovations would include the installation of new glass doors, illuminated signage, parking, security, and improved construction and preparation space. The existing infrastructure would require replacement. A redesign of classrooms would be required for technology upgrades and to maximize space. Redesign of the studio art labs would also be required to provide space for new art methods, materials, and technology.

A board-formed finish would be applied throughout the exterior of the building. The existing elevator does not meet current code and would require replacement. Existing handrails in the stairways would also require replacement.

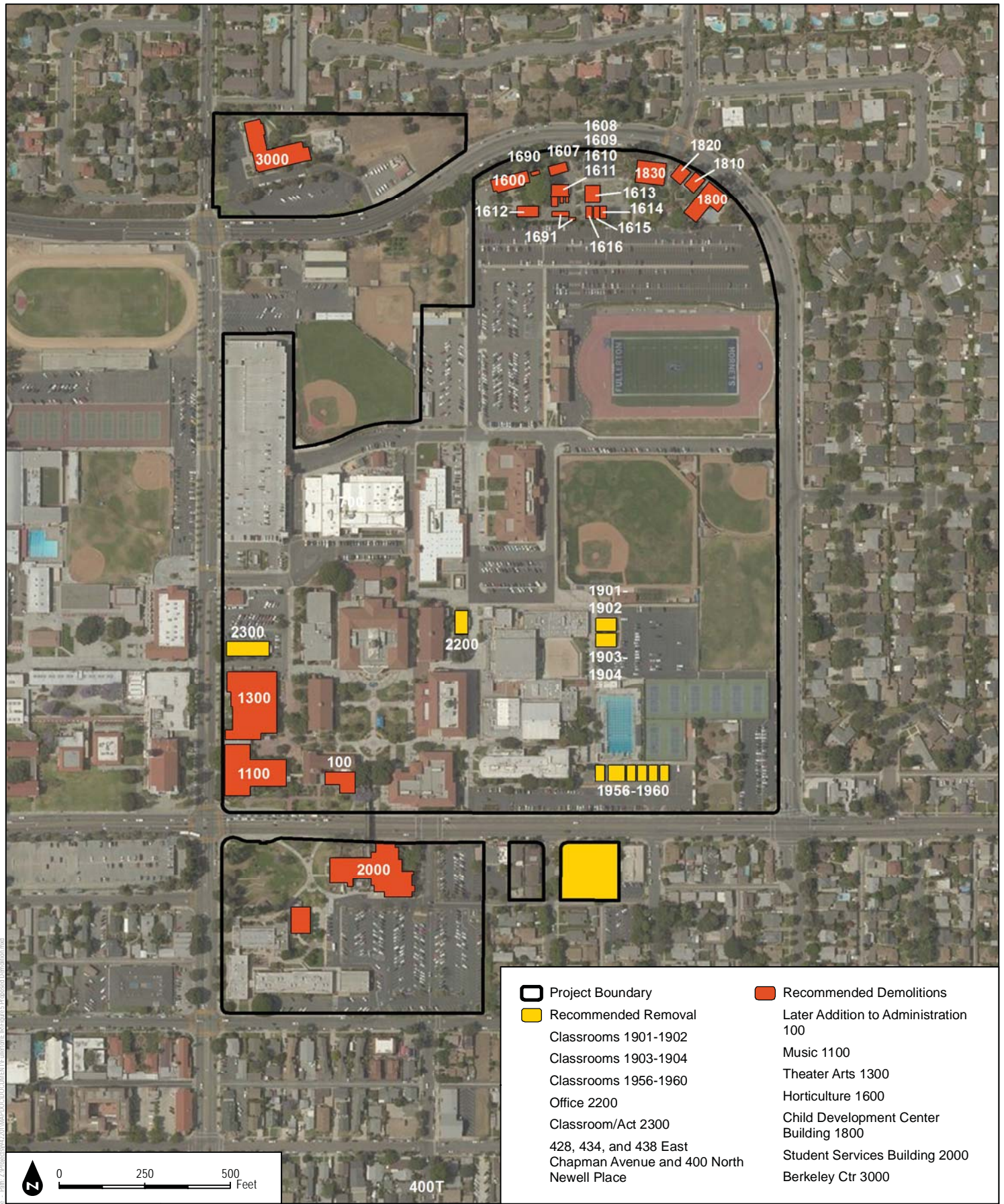
### **Academic Computing Building 3100**

Academic Computing Building 3100 is located in the northernmost portion of the campus, north of Berkeley Avenue. The building would continue to provide academic computing laboratories for students. Renovations would include upgrading technology infrastructure; upgrading building systems, such as mechanical, electrical, plumbing, and structural; increasing restroom capacity to meet current codes; and upgrading access throughout the building to meet current ADA compliance.

#### **1.2.2.3 Demolition**

The following facilities would be removed as part of implementation of the proposed project and would be assessed at the project level. Figure 5 shows which facilities are planned for demolition or removal.





SOURCE: Bing Maps, 2016; HMC Architects, 2011

**DUDEK**

Fullerton College Facilities Master Plan Program Environmental Impact Report

**FIGURE 5**  
Proposed Demolition

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### **Berkeley Center Building 3000**

The existing Berkeley Center Building 3000, constructed in 1960, is located in the northernmost portion of campus, north of Berkeley Avenue. Berkeley Center Building 3000 currently provides space for maintenance and operations, an Assessment Center, and additional facilities space. Removal of this building would provide additional parking for students in the north campus. The services housed in the existing Berkeley Center Building 3000 would be moved to a more central location on campus.

Berkeley Center Building 3000 is a Modern-style, two-story educational building that is L-shape in plan designed by the late master architect William Henry Taylor (1912–1995). The front (northwest) elevation has an uneven roofline and extends out from the rest of the building with broad expanses of brick cladding and windows set flush into the stucco cladding between the brick. There is a separate entrance recessed into the brick wall with a metal door atop a set of concrete steps. The rest of the building is clad in stucco. The rear of the building contains a patio area with concrete walkways, ornamental lawn, and brick planters.

### **Horticulture Building 1600 Complex**

The Horticulture Building 1600 Complex is located in the northeastern corner of campus. The existing buildings range from 17 to 78 years old and currently support the Horticulture program. To accommodate growth in the Horticulture program, the existing buildings would be replaced with more state-of-the-art buildings and outdoor space. The existing buildings are at the end of their useful life.

### **Theatre Arts Building 1300**

Theatre Arts Building 1300 is located in the southwestern portion of the campus. The existing building was built in 1966. To accommodate growth in the Theatre Arts program, the existing building would be replaced with a more updated Performance Arts Complex, which would provide classroom space and accommodate multiple campus programs.

### **Music Building 1100**

Music Building 1100 is located in the southwestern corner of campus, north of East Chapman Avenue. This building was originally constructed in 1966. The intent is to replace Music Building 1100 with a more updated Performance Arts Complex, which would provide classroom space and accommodate multiple campus programs.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Student Services Building 2000**

Student Services Building 2000 is located south of East Chapman Avenue. The original building was constructed in 1984 and would be replaced with a new Welcome Center.

### **Media Services/Academic Computing/Maintenance and Operation Shops Building 2300**

Media Services/Academic Computing/Maintenance and Operation Shops Building 2300 is located on the western edge of campus, north of Theatre Arts Building 1300. This temporary building would be replaced with a new Maintenance and Operations facility and new permanent instructional buildings.

### **Classrooms 1955–1960**

These temporary classrooms are located on the eastern portion of campus, in Lot 8. These temporary buildings would be replaced with new permanent instructional buildings.

### **Classrooms 1901–1904**

These temporary classrooms are located on the eastern portion of campus, in Lot B-2 East. These temporary buildings would be replaced with new permanent instructional buildings.

### **Office Building 2200**

This temporary office building is located in the center of campus, east of Math Building 600. This temporary office building would be replaced with a new Welcome Center, which would provide permanent office space.

### **Child Development Center Building 1800 Complex**

These temporary classrooms are located in the northeastern corner of campus, east of the Horticulture Building 1600 Complex. These temporary classrooms would be replaced with new permanent one-story instructional buildings.

### **428, 434, and 438 East Chapman Avenue and 400 North Newell Place**

These properties are located south of Chapman Avenue and east of North Newell Place and are currently developed with four single-family residences. These properties are currently vacant and would be removed and replaced with an instructional building.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.2.2.4 Site Improvement Elements**

Various site improvement elements include new signage at campus entryways, clear and safe vehicular drop-offs, and creation of more pedestrian pathways.

#### **Parking/Vehicular Entry Improvements**

Primary vehicular circulation is on public streets that surround the campus (Berkeley Avenue, East Chapman Avenue, and North Lemon Street). There is a need to improve circulation and connections on campus between the campus north of Berkeley Avenue and south of East Chapman Avenue, as well as within the main campus. Vehicular drop-off points need to be clearly identified. The campus is not open to bicycles or skateboards.

#### **Pedestrian Circulation**

Fullerton College is primarily a pedestrian-oriented campus, but there is a need for more pathways for pedestrians, particularly for students who park in the north and then walk across parking lots to access instructional buildings in the south of campus.

#### **Infrastructure Improvements**

New buildings would require sewer, water, storm, gas, telecom, and electrical utilities. The upgrades from the thermal energy storage tank will tie in to the existing utility infrastructure, which would accommodate and support these planned upgrades and modifications. New utility lines would connect to the existing infrastructure.

The existing ventilation and air conditioning infrastructure would be modified to connect all chilled and condensing water to the existing central plant and the thermal energy storage tank. An expansion of the existing chiller plant would also occur to serve these new facilities.

Future energy upgrades as part of the Fullerton College Energy Plan would include new lighting upgrades to interior and exterior facilities, HVAC system upgrades, installation of an automatic weather-sensing irrigation system, and installation of chiller water temperature reset controls (Fullerton College 2017). These upgrades are part of ongoing energy improvements, and are separate activities from the proposed project.

## **1.3 Regulatory Setting**

This section includes a discussion of the applicable national, state, and local laws, ordinances, regulations, and standards governing cultural resources, which must be adhered to before and during construction of the proposed project.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.3.1 Federal**

Although there is no federal nexus for this project, National Register of Historic Places (NRHP) criteria was addressed in consideration of previous evaluations that identified the Fullerton College Campus as potentially eligible for the NRHP (see Section 2.1.2, Previously Recorded Cultural Resources).

The NRHP is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service under the U.S. Department of the Interior, the NRHP was authorized under the National Historic Preservation Act, as amended. Its listings encompass all National Historic Landmarks and historic areas administered by the National Park Service.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the NRHP. For a property to be listed in or determined eligible for listing in the NRHP, the property must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history (NRB 2002, p. 2).

Integrity is the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity. The evaluation of integrity is sometimes a subjective judgment, but it must always be

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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grounded in an understanding of a property's physical features and how they relate to its significance. Historic properties either retain integrity (this is, convey their significance) or they do not. To retain historic integrity a property will always possess several, and usually most, of the seven aspects described above. The retention of specific aspects of integrity is paramount for a property to convey its significance (NPS 1990).

### **1.3.2 State**

#### **California Register of Historical Resources**

In California, the term “historical resource” includes, but is not limited to, “any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California” (California Public Resources Code (PRC), Section 5020.1(j)). In 1992, the California legislature established the CRHR “to be used by state and local agencies, private groups, and citizens to identify the state’s historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change” (PRC Section 5024.1(a)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

- (1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
- (2) Is associated with the lives of persons important in our past.
- (3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- (4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1(c)(1–4)).

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

### **California Environmental Quality Act**

As described further, the following CEQA statutes (PRC Section 21000 et seq.) and CEQA Guidelines (14 CCR 15000 et seq.) are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC Section 21083.2(g) defines “unique archaeological resource.”
- PRC Section 21084.1 and 14 CCR 15064.5(a) defines “historical resources.” In addition, 14 CCR 15064.5(b) defines the phrase “substantial adverse change in the significance of an historical resource”; it also defines the circumstances when a project would materially impair the significance of a historical resource.
- PRC Section 21074(a) defines “tribal cultural resources.”
- PRC Section 5097.98 and 14 CCR 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC Sections 21083.2(b) and 21083.2(c) and 14 CCR 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures. Preservation in place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause “a substantial adverse change in the significance of an historical resource” (PRC Section 21084.1; 14 CCR 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1(q)), it is a “historical resource” and is presumed to be historically or culturally significant for purposes of CEQA (PRC Section 21084.1; 14 CCR 15064.5(a)). The lead agency is not precluded from determining that a

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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resource is a historical resource even if it does not fall within this presumption (PRC Section 21084.1; 14 CCR 15064.5(a)).

A “substantial adverse change in the significance of an historical resource” reflecting a significant effect under CEQA means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (14 CCR 15064.5(b)(1); PRC Section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project:

- (1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
- (2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- (3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA (14 CCR 15064.5(b)(2)).

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any “historical resources,” then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource’s historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC Sections 21083.2(a), (b), and (c)).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC Section 21083.2(g)).

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC Section 21083.2(a); 14 CCR 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as a tribal cultural resource (PRC Section 21074(c), 21083.2(h)), further consideration of significant impacts is required.

Section 15064.5 of the CEQA Guidelines assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC Section 5097.98.

### **California Health and Safety Code Section 7050.5**

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (California Health and Safety Code, Section 7050.5(b)). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (California Health and Safety Code, Section 7050.5(c)). The NAHC will notify the “most likely descendant.” With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the most likely descendant by the NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### 1.3.3 Local

#### The Fullerton Plan

The Built Environment and Revitalization sections of *The Fullerton Plan*, the City's General Plan (City of Fullerton 2012a), briefly discuss goals and policies associated with preservation of the built environment. The following are excerpted portions pertinent to the Fullerton College Facilities Master Plan.

**Goal 4** Value and preserve historic resources.

#### **Policy 4.2: Awareness of Historic Resources**

Support programs and policies to raise the awareness of the value of historic resources in strengthening communities, conserving resources, fostering economic development, and enriching lives.

#### **Policy 4.3: Historic Resources Maintenance and Enhancement**

Support projects, programs, policies, and regulations to promote the maintenance, restoration, and rehabilitation of historical resources.

#### **Policy 4.4: Historic Character and Sense of Place**

Support projects, programs, policies, and regulations to reinforce the character and sense of place of established neighborhoods and districts by protecting and preserving those elements in both the private and public realms which contribute to the historic character through the use of tools including, but not limited to, preservation overlay zones and landmark districts.

#### **Policy 4.5: Historic Building Preservation**

Support projects, programs, policies, and regulations to encourage the protection and preservation of individual historic structures throughout the City, but with particular attention to the preservation of noteworthy architecture in the downtown.

#### **Policy 4.7: Responsiveness to Historic Context**

Support projects, programs, policies, and regulations to design new buildings that respect the integrity of nearby historic buildings while clearly differentiating the new from the historic.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Policy 4.9: Historic Building Retrofits**

Support projects, programs, policies, and regulations to encourage the retrofit of historic buildings in ways that preserve their architectural design character, consistent with life safety considerations, maintaining the unique visual image of Fullerton.

**Goal 11** Revitalization activities that result in community benefits and enhance the quality of life in neighborhoods, districts, and corridors.

### **Policy 11.3: Preservation-Based Revitalization**

Support policies, projects, and programs concerning historic preservation to protect Fullerton's heritage, revitalize neighborhoods, generate design and construction jobs, and bolster the community's sense of place.

### **City of Fullerton Municipal Code**

Although the City of Fullerton has no jurisdiction over the proposed project, the college is located within the City of Fullerton. Therefore, local designation criteria are applicable to significance evaluations on campus. In the City of Fullerton Municipal Code, a "Significant Property" is defined as an individual building, structure, or feature that is considered a historical or cultural resource in the City and that is eligible for "Historical Landmark" designation. A list of Significant Properties is contained in the Resource Management Element of The Fullerton Plan.

#### ***15.48.060. Criteria for Designation***

- A. In considering a request for a "Historical Landmark" designation, the following criteria shall be used in determining eligibility:
1. Character, interest or value as part of the heritage of the city.
  2. Location as a site of a historic event.
  3. Identification with a person or persons or groups who significantly contributed to the culture and development of the city.
  4. Exemplification of a particular architectural style or way of life important to the city.
  5. Exemplification of the best remaining architectural types in an area.
  6. Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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7. Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.
  8. Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.
  9. A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.
  10. Integrity as a natural environment that strongly contributes to the well being of the people of the city.
- B. In considering a request for a “Landmark District” designation, support of the designation should be demonstrated by a substantial majority of the property owners within the boundary of the proposed district (City of Fullerton Municipal Code, Ordinance 2982, 2001).

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Fullerton College Facilities Master Plan Program EIR**

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# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

## 2 BACKGROUND RESEARCH

### 2.1 CHRIS Records Search

On December 14, 2016, Dudek archaeologist Adriane Dorrlor conducted a search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC), located on the campus of California State University, Fullerton. The search included any previously recorded cultural resources and investigations within a 0.5-mile radius of the project site. The CHRIS search also included a review of the NRHP, the CRHR, the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list. The records search results maps and bibliography of previous studies are provided in Confidential Appendix A.

#### 2.1.1 Previously Conducted Cultural Resources Studies

A total of seven cultural resources studies were previously conducted within a 0.5-mile radius of the project site (Table 1). Of these, one study (OR-03509) overlaps the current project site. An additional seven studies were conducted within the La Habra and Anaheim quadrangles that may include portions of the proposed project site. However, these studies are not mapped due to insufficient locational data. Confidential Appendix A provides a complete bibliography from the SCCIC, including the unmapped studies not included in Table 1.

**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

<b>SCCIC Report No.</b>	<b>Title of Study</b>	<b>Author(s) and Date</b>	<b>Proximity to Project Site</b>
OR-00559	Archaeological Survey of T.t. No. 9730, City of Fullerton, County of Orange, California	Cottrell, Marie G., 1977	Overview Study
OR-01114	An Archaeological Assessment for the Florence Crittenton Services of Orange County Fullerton, California	Cameron, Constance, 1991	Outside
OR-02101	An Archaeological Survey of Redevelopment Property in the City of Fullerton for the Orange County Transit District	Cameron, Constance, 1979	Outside
OR-02512	Cultural Resource Assessment, AT&T Wireless Services Facility No. 13054a, Orange County, California	Duke, Curt and Judith Marvin, 2002	Outside
OR-02564	Archaeological Assessment for Paseo Park, City of Fullerton, California	Demcak, Carol R., 2002	Outside
OR-02763	Proposed Verizon Wireless Facility: Commonwealth (9990225) in the City of Fullerton, Orange County, California	Maki, Mary K., 2001	Outside

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

SCCIC Report No.	Title of Study	Author(s) and Date	Proximity to Project Site
OR-2766	Cultural Resources Records Search and Literature Review Report for a Verizon Wireless Telecommunications Facility: Cell Site Commonwealth (99900225) in the City of Fullerton, Orange County, California	Mason, Roger D., 2001	Outside
OR-02768	Archaeological Survey and Record Search for Opsc-0038, La/Fullerton, Fullerton, Orange County (800-42)	Holson, John, 2002	Outside
OR-02811	Cultural Resource Assessment at AT&T Wireless Services Facility No. 13055a Orange County, California	Duke, Curt, 2002	Outside
OR-02831	Records Search for Crosswalk Lighting Project, Commonwealth Ave. at Yale Ave., City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02832	Records Search for Crosswalk Lighting Project, Raymond Ave. at Wilshire Ave., City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02839	Records Search for Crosswalk Lighting Project, Harbor Boulevard at Ellis Place, City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02895	Cultural Resources Records Search and Site Visit Results for Nextel Communications Candidate Ca8762a 147 East Amerige Avenue, Fullerton, Orange County, California	Bonner, Wayne H., 2005	Outside
OR-03298	(see LA7871) Historical Resource Evaluation Report Third Main Track and Grade Separation Project Hobart (mp 148.9) to Basta (mp 163.3), BNSF/Metrolink East-West Main Line Railroad Track, Vernon to Fullerton, Los Angeles and Orange Counties, California	Tang, Bai "Tom" and Teresa Woodward, 2003	Outside
<b>OR-03509</b>	<b>Cultural Resources Survey, Fullerton College, North Orange County Community College District</b>	<b>Secord, Paul R., 2003</b>	<b>Within</b>
OR-03825	A Cultural Resources Inventory of Planning Area 9B and 9C, Irvine, California	Drover, Christopher, 2000	Outside
OR-03921	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA03022-A (Fullerton Hand Car Wash), 812 North Harbor Boulevard, Fullerton, Orange County, California	Bonner, Wayne, 2010	Outside
OR-04012	Records Search for Bechtel Corporation Site LSAACA3028 (Elks Club C.O.W.)	Wlodarski, Robert, 2008	Outside
OR-04045	American Recovery and Reinvestment Act (ARRA) Funded Security Enhancement Project (PRJ29112364) – Station Hardening CCTV Surveillance System Upgrades, and Airborne Particle Detection at Fullerton Station, Fullerton, Orange County, California	Speed, Lawrence, 2009	Outside
OR-04086	Archaeological and Paleontological Resources Monitoring Compliance Report for the Fullerton transit Project, City of Fullerton, Orange County, California	Glover, Amy and Gust, Sherri, 2011	Outside

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

SCCIC Report No.	Title of Study	Author(s) and Date	Proximity to Project Site
OR-04467	Cultural Resources Records Search Results for T-Mobile West, LLC Candidate LA02531A (CM531 AT&T Office) 143 Amerige Avenue, Fullerton, Orange County, California	Bonner, Diane, Wills, Carrie and Crawford, Kathleen, 2014	Outside
OR-04467A	Direct APE Historic Architectural Assessment for T-Mobile West, LLC Candidate LA02531A (CM531 AT&T Office) 143 Amerige Avenue, Fullerton, Orange County, California	Bonner, Wayne H. and Kathleen A. Crawford, 2014	Outside

**Notes:**

SCCIC = South Central Coastal Information Center.

Items shown in **bold** are on the project site.

## **OR-03509**

In August 2003, Paul Secord of UltraSystems Environmental Incorporated prepared the *Cultural Resources Survey, Fullerton College, North Orange County Community College District*. The study was prepared as part of an EIR for the Fullerton College Master Development Plan. A total of seven buildings were recommended as eligible for the CRHR and NRHP: Fullerton College Student Union Building 800, Fullerton College Industrial Building , Fullerton College Commerce Building 300, Fullerton College Administration Building 100, Wilshire Theatre Building 2100 (School Auditorium), Wilshire School Building 1A (Elementary School), and Wilshire School Building 2A (Elementary School).

## **GPA 2015**

One additional study within the proposed project site that was not identified by the CHRIS records search is a 2015 study conducted by GPA Consulting (GPA) entitled *428, 434, and 438 East Chapman Avenue, Fullerton, California, Historical Resource Evaluation Report*. This report presents the results of a historical resource evaluation of three properties using NRHP, CRHR, and Fullerton Historical Landmark criteria. The study concluded that none of the properties appear eligible for listing in any of the three registration programs due to a lack of historical significance.

### **2.1.2 Previously Recorded Cultural Resources**

Forty-two cultural resources were previously recorded within 0.5 miles of the project site (Table 2). Two of these resources overlap the proposed project site: Fullerton Junior College (FJC) (30-157212) and Wilshire Junior High School (30-157290). Both of these resource evaluations were

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

updated as part of the current study. There is one archaeological resource recorded within 0.5 miles of the project site (30-001712). Of the 41 structures and buildings recorded within 0.5 miles of the project site, 13 are listed in the NRHP (30-157210, -157213, -157218, -157226, -157232, -157247, -157253, -157254, -157261, -157278, -157289, -157299, and -157300), 8 are listed as City of Fullerton Local Landmarks (30-157210, -157211, -157213, -157253, -157254, -157261, -157289 and -157290), 1 is listed as a City of Fullerton Potential Local Landmark and is recognized as a City of Fullerton Significant Property (30-157212), 1 was found to be a contributing property to a district eligible for local listing (30-156665), and 2 were determined not eligible through Section 106 consultation (30-161896 and -162503).

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-001712	Historic: Fullerton Transit Historical Refuse deposit (CA-ORA-1712H)	Mort, J., 2010	Unknown	Outside
30-001724	Union Pacific Park	Gold, A., 2013	Unknown	Outside
30-156665	Historic: 1321 Frances Ave. (place where Hawaiian Punch formula was invented)	Jones, T., 2007	5D2	Outside
30-157210	Historic: Plummer (Louis) Auditorium, 201 East Chapman Ave.	Miller, E., 1979	1S (HL-10)	Outside
30-157211	Historic: Fullerton Union High School, 201 East Chapman Ave.	Miller, E., 1979	7N; (HL-78, -79, -81)	Outside (adjacent to southwest)
<b>30-157212</b>	<b>Historic: Fullerton Junior College, 321 East Chapman Ave.</b>	<b>Miller, E., 1979</b>	<b>7N; Potential Local Landmark (recognized as significant property)</b>	<b>Within</b>
30-157213	Historic: Hetebrink (John) House, 515 East Chapman Ave.	Miller and Woodward, 1978	1S; (HL-40)	Outside
30-157218	Historic: Commercial Building, Amerige (George) Block (Addresses include: 109, 111, 113, 115, 117, 119, 121, 123 East Commonwealth Ave.)	Miller, E., 1979	1S	Outside
30-157226	Historic: Old Fellows Hall, 114 East Commonwealth Ave.	Miller, E., 1979	1S	Outside
30-157227	Historic: Commercial Building, 118 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157228	Historic: Pacific Electric Railway Depot, 128 East Commonwealth Ave.	Stone, M., 1978	2S	Outside
30-157229	Historic: Residence, Davies (Richard Thomas) House, 145 East Commonwealth Ave.	Stone, M., 1978	7N	Outside

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-157230	Historic: Fullerton Post Office, 202 East Commonwealth Ave.	Miller, E., 1979	Unknown	Outside
30-157232	Historic: Fullerton City Hall, 237 West Commonwealth Ave.	Richey, D., 2002	1S	Outside
30-157234	Historic: Loumagne's Market, 329 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157235	Historic: Grumwald's (Gus) Tin Shop, 341 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157237	Historic: Multi-family Residence, 520 East Commonwealth Ave.	Williman, L., 1979	5S2	Outside
30-157238	Historic: Residence, 524 East Commonwealth Ave.	Williman, L., 1979	5S2	Outside
30-157247	Historic: Farmers and Merchants Bank of Fullerton, 122 North Harbor Blvd.	Marsh, D., 1993	1S	Outside
30-157248	Historic: Masonic Temple, 201-203 North Harbor Blvd.	Stone, M., 1978	7N	Outside
30-157252	Historic: Peninsula Oil Burner Company, 425-427 South Harbor Blvd.	Miller, E., 1979	5S2	Outside
30-157253	Historic: Fox Fullerton Theatre Complex, 500-512 North Harbor Blvd.	Richey, D., 2006	1S (HL-35)	Outside
30-157254	Historic: Masonic Temple, 501 North Harbor Blvd.	National Park Service, 1995	1S (HL-43)	Outside
30-157261	Historic: Hillcrest Park, 200 Brea Blvd.	Richey, D., 2003	1S (HL-6)	Outside
30-157270	Historic: Residence, 117 South Pomona Ave.	Bryant, W., 1979	7N	Outside
30-157278	Historic: Santa Fe Railway Passenger and Freight Depot	Stone, M., 1978	1S, 3S, 2S3, 2S, 2S2	Outside
30-157280	Historic: Commercial Building, 125 West Santa Fe Ave.	Miller, E., 1979	5S2	Outside
30-157281	Historic: Sanitary Laundry, 225 West Santa Fe Ave.	Miller, E., 1979	5S2	Outside
30-157284	Historic: Union Pacific Passenger and Freight Depot	Stone, M., 1978	3S	Outside
30-157289	Historic: Dewella Apartments, 234 East Wilshire Ave.	National Park Service, 2009	1S (HL-70)	Outside
<b>30-157290</b>	<b>Historic: Wilshire Junior High School, 315 East Wilshire Ave.</b>	<b>William, L. 1979</b>	<b>7N (HL-12)</b>	<b>Within</b>
30-157299	Historic: Fullerton Union Pacific Depot, 100 East Santa Fe Ave.	Loomis, J., 1982	1S	Outside
30-157300	Historic: Chapman Building, 110 East Wilshire Ave.	Galvin, T., 1982	1S	Outside



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-161896	Historic: Residence at 412 S. Pomona Ave.	Morad, L., 1991	6Y	Outside
30-162503	Historic: 134 West Truslow Ave.	SHPO, 1995	6Y	Outside
30-176663 / 19-186804	Historic: Burlington Northern Santa Fe Railway	McCormick, S. 2007; Tang, B. 2002	6Z	Outside
30-176766	Historic: Fullerton First Methodist Episcopal Church, 117 N. Pomona Ave.	Richey, D., 2000	Unknown	Outside
30-176951	Historic: Residence, 615 E. Commonwealth Ave.	Jacquemain, T., 2009	5D2	Outside
30-177471	Historic: Fender's Radio Service, 1-7 S. Harbor Blvd.	National Park Service, 2013	1S	Outside
30-177510	Historic: Pacific Telephone and Telegraph Company, 143 East Amerige Ave.	Gallegos and Taniguchi, 2005	6Y	Outside
30-179864	Historic: Residence, 408 E. Truslow Ave.	SHPO, 2003	Unknown	Outside

**Notes:**

1S: Individual property listed in the NRHP by the Keeper. Listed in the CRHR.

2S: Individual property determined eligible for NRHP by the Keeper. Listed in the CRHR.

2S2: Individual property determined eligible for NRHP by a consensus through Section 106 process. Listed in the CRHR.

2S3: Individual property determined eligible for NRHP by Part 1 Tax Certification. Listed in the CRHR.

3S: Appears eligible for NRHP as an individual property through survey evaluation.

5D2: Contributor to a district that is eligible for local listing or designation.

5S2: Individual property that is eligible for local listing or designation.

6Y: Determined ineligible for the NRHP by consensus through Section 106 process. Not evaluated for CRHR or local listing.

6Z: Found ineligible for NRHP, CRHR, or local designation through survey evaluation.

7N: Needs to be reevaluated (formerly NRHP status code 4).

HL: City of Fullerton Local Landmark.

Resources shown in **bold** are on the project site.

### **30-157212**

A Historic Resources Inventory form was completed for FJC by Emily Miller in March of 1979. The form identified four of the buildings on the FJC Campus that were constructed with Works Progress Administration (WPA) funding throughout the 1930s by architect Harry Vaughn.

### **30-157290**

A Historic Resources Inventory form was completed for the Wilshire Junior High School by Lex Williman in March of 1979. The survey identified three buildings that were constructed with WPA funding in the 1930s by an unknown architect.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **428, 434, and 438 East Chapman Avenue**

As previously discussed, these previously recorded and evaluated resources were not identified by the CHRIS records search but fall within the proposed project site. In 2015, GPA evaluated all three properties using NRHP, CRHR, and Fullerton Historical Landmark criteria. The study concluded that none of the properties appear eligible for listing in any of the three registration programs due to a lack of historical significance.

## **2.2 Native American Coordination**

As part of the process of identifying cultural resources within or near the project site, Dudek contacted the NAHC to request a review of the Sacred Lands File. The NAHC emailed a response on January 19, 2017, which stated that the Sacred Lands File search was completed with negative results. Because the Sacred Lands File search does not include an exhaustive list of Native American cultural resources, the NAHC suggested contacting Native American individuals and/or tribal organizations who may have direct knowledge of cultural resources in or near the project site. The NAHC provided the contact list along with the Sacred Lands File search results. Documents related to the NAHC Sacred Lands File search are included in Appendix B.

Dudek prepared and sent letters to each of the nine persons and entities on the contact list requesting information about cultural sites and resources in or near the project site. These letters, mailed on February 16, 2017, contained a brief description of the proposed project, a summary of the Sacred Lands File and SCCIC search results and survey results, and a reference map. Recipients were asked to reply within 15 days of receipt of the letter should they have any knowledge of cultural resources in the area.

Dudek has received one response to the coordination letters to date (Appendix B). On February 24, 2017, Andrew Salas, Chairman of the Gabrieleño Band of Mission Indians – Kizh Nation responded via email. Mr. Salas stated that the proposed project site is in an area where the ancestral territories of Kizh Gabrieleño villages overlapped during the Late Prehistoric and Protohistoric periods. For this reason, Mr. Salas considers the project site to be highly sensitive for cultural resources and recommends the presence of both a Native American monitor and an archaeological monitor on site during all ground-disturbing activities.

The proposed project is subject to compliance with Assembly Bill 52 (PRC 21074), which requires consideration of impacts to “tribal cultural resources” as part of the CEQA process, and requires the CEQA lead agency to notify any groups (who have requested notification) of the proposed project who are traditionally or culturally affiliated with the geographic area of the

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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project. Because Assembly Bill 52 is a government-to-government process, all records of correspondence related to Assembly Bill 52 notification and any subsequent consultation are on file with the District. At the time this report was written, the District indicated they had not received any AB 52 consultation requests on the proposed project at Fullerton College.

### 2.3 Building Development Research

On February 24, 2017, Dudek contacted Oscar Saghie, Project Manager of Campus Capital Projects, to inquire about access to Fullerton College Campus building as-built drawings and schematics, and to obtain copies of any available reports and historic reference documents on file with Fullerton College or the District. Mr. Saghie arranged for access to the District's electronic collection of campus as-built drawings and schematics, which date from 1933 to 2013.

Dudek also reviewed a set of documents and photographs available online through the Fullerton College Library called *Fullerton College: A Pictorial History*, which includes a collection of historic photographs of the campus with content largely written by Debora Richey et al. in 2012.

Other sources of information regarding the history and development of the campus included the following:

- *Los Angeles Times* (1923–current), accessed via ProQuest Historical Newspapers
- *Los Angeles Times*, accessed via Newspapers.com
- *San Diego Union*, accessed via Genealogybank.com
- *San Francisco Chronicle*, accessed in person at Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton News Tribune*, accessed in person at Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton City Directories*, accessed in person at the Fullerton Public Library Local History Room on March 16, 2017
- *Archival and historical files*, accessed in person at the Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton Through the Years: A Survey of Architectural, Cultural & Environmental Heritage*, accessed through the City of Fullerton's website at [www.cityoffullerton.com](http://www.cityoffullerton.com)
- Historical aerial photograph research from the years 1952, 1953, 1954, 1963, 1972, 1994, 2002, 2003, 2004, 2005, 2009, 2010, and 2012 (NETROnline 2017)
- 1927–1949 Sanborn Fire Insurance Company maps (Sanborn).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3 HISTORIC CONTEXT**

Post-contact history for the State of California is generally divided into three periods: the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican–American War, signals the beginning of the American period, when California became a territory of the United States.

#### **Spanish Period (1769–1822)**

Spanish explorers made sailing expeditions along the coast of Southern California between the mid-1500s and mid-1700s. In search of the legendary Northwest Passage, Juan Rodríguez Cabrillo stopped in 1542 at present-day San Diego Bay. With his crew, Cabrillo explored the shorelines of present-day Santa Catalina Island, as well as San Pedro and Santa Monica Bays. Much of the present-day California and Oregon coastline was mapped and recorded in the next half-century by Spanish naval officer Sebastián Vizcaíno. Vizcaíno’s crew also landed on Santa Catalina Island and at San Pedro and Santa Monica Bays, giving each location its long-standing name. The Spanish crown laid claim to California based on the surveys conducted by Cabrillo and Vizcaíno (Bancroft 1885; Gumprecht 1999).

More than 200 years passed before Spain began the colonization and inland exploration of Alta California. The 1769 overland expedition by Captain Gaspar de Portolá marks the beginning of California’s Historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, while Portolá was exploring Southern California, Franciscan Friar Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823.

The Portolá expedition first reached the present-day boundaries of Los Angeles in August 1769, thereby becoming the first Europeans to visit the area. Father Crespi named “the campsite by the river Nuestra Señora la Reina de los Angeles de la Porciúncula” or “Our Lady the Queen of the Angeles of the Porciúncula.” Two years later, Friar Junípero Serra returned to the valley to establish a Catholic mission, the Mission San Gabriel Arcángel, on September 8, 1771 (Kyle 2002).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Mexican Period (1822–1848)**

A major emphasis during the Spanish period in California was the construction of missions and associated presidios to convert the Native American population to Christianity and integrated communal enterprise. Incentives were also provided to bring settlers to pueblos or towns, but just three pueblos were established during the Spanish period, only two of which were successful and grew into California cities (San José and Los Angeles). Several factors kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the indigenous population. After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Dallas 1955).

Extensive land grants were established in the interior during the Mexican period, in part to increase the population inland from the more settled coastal areas where the Spanish first concentrated their colonization efforts. Nine ranchos were granted between 1837 and 1846 in the future Orange County area (Middlebrook 2005). Among the first ranchos deeded within the future Orange County were Manuel Nieto's Rancho Las Bolsas (partially in the future Los Angeles County), granted by Spanish Governor Pedro Fages in 1784, and the Rancho Santiago de Santa Ana, granted by Governor José Joaquín Arrillaga to José Antonio Yorba and Juan Pablo Peralta in 1810. The secularization of the missions following Mexico's independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos.

During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary Southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of non-native inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

### **American Period (1848–Present)**

War in 1846 between Mexico and the United States precipitated the Battle of Chino, a clash between resident *Californios* and Americans in the San Bernardino area. The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American period.

California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as U.S. Territories (Waugh 2003). Horticulture and

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the Southern California economy through 1850s. The Gold Rush began in 1848 and, with the influx of people seeking gold, cattle were no longer desired mainly for their hides but also as a source of meat and other goods. During the cattle boom of the 1850s, rancho *vaqueros* drove large herds from Southern to Northern California to feed that region's burgeoning mining and commercial boom. The cattle boom ended for Southern California as neighboring states and territories began driving herds to Northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 1941).

### **3.1 City of Fullerton Historical Overview**

#### **Residential Development**

The architectural development of the City of Fullerton, as for a lot of cities, was shaped by the demographics of the City. Unlike high-style architectural movements seen in other cities, Fullerton represents a middle- and working-class development pattern starting prior to the City's founding in 1887. Prior to 1887, the development within Fullerton was largely pioneer settlements without significant architectural presences. It was not until the early 1900s that residential and commercial development really took off in Fullerton. Another interesting feature of the development in Fullerton is the concept of moving buildings from their original locations. The following discussion on residential development is largely based on information from *Fullerton Through the Years: A Survey of Architectural, Cultural & Environmental Heritage*, prepared for the Development Services Department (DSD) in 2002.

The period of Fullerton's architectural history beginning in 1900 represents a departure from the early founding patterns and a move to modern city development. Fullerton was largely an agricultural community until oil was discovered in 1890. The resulting oil boom in Fullerton continued into the 1920s, making a great deal of the residential and commercial developments of the early twentieth century possible (Morris et al. 2004). Although there are a few surviving pre-1900 buildings, most of the visible architectural development in the City is post-1900. Most of the buildings built prior to the turn of the century were largely vernacular and lacked the sophistication and key elements for classification as high style. Even though recognizable architectural styles appeared in Fullerton after the turn of the century, Fullerton was primarily a working- and middle-class city. This is reflected in buildings from the period, which lack many of the high-style elements seen in the truest forms of the early twentieth century styles.

Like other cities throughout the United States, Fullerton saw a boom era in the 1920s that laid the groundwork for the City's residential architectural foundation. The boom was seen in both residential and commercial building types and can largely be attributed to the oil boom. In 1920, Fullerton established an unofficial policy stating that Spanish Colonial Revival should be the



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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style used when designing commercial and civic buildings, a policy that was largely followed by the business and civic leaders of the City until the 1950s.

One of the most prevalent architectural styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. In the City of Fullerton, California bungalows were popular and prevalent from 1915 to 1925 (DSD 2002; McAlester 2015).

Although the California Bungalow's popularity seemed unlikely, with its heavy use of wood in an area like Southern California where termite populations were high, it flourished. One of the key characteristics of the California Bungalow is the simplistic beauty and small footprint, which made it ideal for small families living on a middle-class budget. The key features of the style include one- to two-story designs, overhanging eaves, distinct horizontal lines, low pitched roof designs, wood shingle detailing, large front porches either centered or offset, paired windows, Craftsman style doors, interior built-in cabinets, recessed entryways, stone or brick fireplaces, and battered wooden porch supports (DSD 2002; McAlester 2015).

The California Bungalow was also taken a step further in cities like Fullerton, being used to create a Bungalow Court. A Bungalow Court is a collection of bungalows placed around a shared garden space to create a U shape. The intention of the Bungalow Court was to create a multi-family dwelling concept that provided greenspace for families or individuals who could not afford a single-family residence on their own private lot. Fullerton Bungalow Courts were placed near the downtown area within easy walking distance of urban amenities. Like standard Bungalow Courts, Fullerton Bungalow Courts typically provided six to ten units in a U shape, with a larger bungalow to the rear of the property forming the base of the U shape (DSD 2002).

In addition to California Bungalows, the Cottage/Storybook style also had some popularity in Fullerton during the 1920s. According to Fullerton Heritage, a local builder named E.S. Gregory built a tract of cottages on the north side of East Whiting Avenue and later the City built a model Cottage as a way to promote home buying in the City. The Cottage movement in Fullerton was short-lived and was not seen past 1935 in Fullerton, but there are still numerous examples remaining in the City today (DSD 2002).

The City of Fullerton experienced its last big housing boom following World War II (WWII) as veterans and young families were looking for places to call home. Throughout the 1940s and 1950s, the building permit valuations saw an incredible increase from \$2.5 million in 1948 to \$114 million by 1956 (DSD 2002; Morris et al. 2004).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2 Fullerton College Historical Overview**

The following historical context is largely drawn from the Fullerton College Library's *Fullerton College: A Pictorial History* (Richey et al. 2012).

#### **3.2.1 Fullerton College Beginnings**

Educational development in the City of Fullerton quickly followed the City's founding in 1887. Although high schools and grammar schools were the frontrunners in educational development, the City residents and leaders quickly realized that they needed an educated workforce for their growing city. In 1907 California became the first state with legislation that allowed for the establishments of junior colleges. The City of Fullerton quickly adapted the legislation and by April of 1913 established a junior college program stemming from the Fullerton Union High School. According to Fullerton College Library's *Fullerton College: A Pictorial History*, FJC first opened in September of 1913 with the following:

...enrollment of twenty-eight male and female students who registered for twelve classes, including English, Art, History, Logic, Psychology, Mathematics, Physics, Chemistry, German, Mechanical Drawing, and Manual Training (Richey et al. 2012).

On April 10, 1933, the California Field Act was passed to allow state input, inspection, and approval on school building plans. The Field Act was established as a reactionary legislative act to the Long Beach Earthquake of 1933 and the resulting damage and destruction caused to schools throughout Southern California. The 6.4 magnitude earthquake proved many schools unsafe and constructed without safeguards to protect against earthquake damage. Moving forward, all school building renovations and constructions had to be compliant with Field Act legislation to avoid a repeat of the events of the Long Beach Earthquake. In 1949, Donald Beach Kirby, president of the American Institute of Architects (AIA) in San Francisco, stated that all schools since 1933 met the requirements laid out by the Field Act of 1933 (SDU 1949; Alquist 2007).

In 1933, the Board of Trustees purchased 16 acres of land one block east of Fullerton Union High School. The acquisition of this parcel of land was the first official step taken by the board to separate the high school from the new FJC Campus. The Board of Trustees hired architect Harry K. Vaughn (1882–1962) to replace Carleton M. Winslow (Vaughn's mentor) as campus architect. Winslow was hired by the District in 1919 and designed all major buildings on the adjacent Fullerton Union High School campus. Prior to arriving in Fullerton, Vaughn had worked closely with Winslow on the extremely influential Panama-California International Exposition in San Diego (1915-1917) and followed Winslow back to Los Angeles to work on the



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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high school project. While working with Winslow on the high school campus, Vaughn oversaw the finalization of drawings as well as construction of the buildings.

For its new FJC Campus, the college put Vaughn in charge of the design, planning, and development of the FJC Campus from 1935 to 1942. Vaughn brought a great deal of experience and expertise to the FJC Campus design. Prior to becoming the FJC Campus architect, Vaughn had studied and worked under accomplished California architects Irving Gill, William Sterling Hebbard, and Octavius Morgan. However, his most relevant experience was gained during his time working on Fullerton Union High School buildings with Winslow (Richey 2010).

### **3.2.2 The Great Depression and World War II**

Although the Great Depression financially devastated most of the country, the development of the FJC Campus continued.

Vaughn operated as the FJC Campus architect with the assistance of WPA funds, designing and supervising construction of numerous buildings on the campus until 1942. The costs for building construction under Vaughn were as follows:

Commerce Building (\$148,777), the Social Science and Administration Building (\$163,633), the Technical Trades Building (\$224,321), the Locker Room and Student Center (\$60,454), and the Shop Building (\$76,605). Vaughn also designed the walls for the sunken garden and additional landscaping features (\$47,793) (Richey et al. 2012).

While architectural development continued during the Depression, enrollment also increased. With 4-year university enrollments on the decline due to financial instability, FJC provided an affordable option for the students of Fullerton and the surrounding communities, eventually reaching an enrollment of 1,500 by September 1939. However, FJC was not immune to the effects of WWII and experienced a rapid decline in enrollment after 1939, as many potential students were drafted or volunteered for the military. FJC persevered through the war, implementing new programs to support the war effort by training workers for defense industry jobs. FJC had the Adult Education Department staff working 6 days a week in multiple shifts to keep the school doors open from 7:00 a.m. to midnight, 6 days per week. Other activities on the FJC Campus further supported the war effort, such as letter writing and making clothing for the troops (LAT 1935; Richey et al. 2012).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2.3 Postwar Expansion on Campus**

As the war was ending in 1944, the Servicemen Readjustment Act, also known as the G.I. Bill of Rights, was signed into law by President Franklin D. Roosevelt. The act afforded servicemen and women the opportunity to receive an education without having to worry about the high costs of tuition, and provided a monthly stipend for living expenses. The act also covered the costs of schoolbooks and other necessary supplies. These government incentives resulted in approximately 1.7 million veterans enrolling in colleges by 1947, accounting for nearly 49% of college admissions under the G.I. Bill. Of the 16 million WWII veterans in the United States, 7.8 million participated in higher education programs because of the G.I. Bill.

Although FJC did its best to anticipate the educational needs of WWII veterans, they were ultimately unprepared for the rush of student veterans. In the school year 1944–1945, only 15 veterans were enrolled at FJC. By 1946–1947, after the G.I. Bill had officially been signed into law, that number jumped drastically to 843 students. Not only did FJC have the largest freshman class in its history, but men outnumbered women by more than two to one. FJC found itself in dire need of funding to accommodate the demands of the veteran student population. The veteran population also had a different set of needs than that of the typical college student. Many of the veterans had not yet graduated high school and had to complete special courses at Fullerton Union High School. In addition, the veterans were often older; many were already married with young children at home. Some were in need of special psychological, vocational, and other types of counseling.

Housing was ultimately the biggest problem on the FJC Campus. The City of Fullerton had already experienced a drought in the housing market during the 1920s and 1930s, and the problem only worsened after the war when veterans returned home to settle down and start families, discovering that there was no housing available. To help remedy the problem, the FJC established a Veterans Home in 1946, the only school-sponsored housing for G.I. students in Southern California. The Veterans Home served as a dormitory for up to 40 single veterans and was located at the end of Las Palmas Drive in Sunny Hills. Because many veterans were married with small children, the Board of Trustees purchased a 4.1-acre property for \$10,126 in 1946 from City librarian Carrie Sheppard and her mother Dixie Carolyn to house married veterans and their families. The property was located adjacent to the northern boundary of the FJC Campus with a 276-foot frontage along North Harvard Avenue (now Lemon Street). With the support of the Federal Public Housing Authority, FJC was able to set up 25 temporary dwellings. Eventually 51 dwelling units were constructed, providing homes for 125 married veterans and their families on the FJC Campus.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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This was a tremendous accomplishment for FJC and an example of great cooperation among agencies; FJC was the first educational institution in California to apply for and be granted veteran student housing. The federal government provided the housing, the state government paid for all associated utilities, and FJC donated the land to build the property. The G.I. housing at 1000 North Harvard Avenue would eventually name itself “College View,” and would remain in place just north of the FJC Campus until around 1956. Although originally constructed for veterans of WWII, the onset of the Korean War provided a good reason to keep the housing in place for years to follow. By 1956, 381 Korean War veterans were enrolled at FJC, many of whom lived in College View (LAT 1954a).

With a growing post-war population, residents of the City of Fullerton approved tax increases and bond measures in support of the development of new schools and the expansion of existing campuses. FJC hired Pasadena architectural firm Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) to design a new master plan for the campus. This led to a number of new building projects on the FJC Campus, all under the architectural design of William H. Taylor, including a new Science building, Gymnasium, Library, Student Center, Technical Education building, Art–Home Economics building, and District Administration Center.

In 1965, FJC Superintendent Ernest G. Lake replaced architects Taylor and Conner with William E. Blurock and Associates. In addition to designing new buildings, Blurock’s firm made additions to the existing Library and Science buildings. Hoping that the addition of new buildings would finally be adequate to accommodate its student population, the District parted with the temporary classrooms it had obtained from the federal government at the end of WWII. By 1968, the District was forced to lease portable classrooms after underestimating its growing student body. By the time FJC reached its 50th anniversary in 1963, its regular daytime student enrollment had risen to 9,000; approximately 560 courses were being offered; and the FJC Campus had grown to over 57 acres, with 17 buildings valued between \$12 and \$15 million. In 1965, enrollment saw an unexpected sharp rise in the number of male students, who were hoping to avoid being drafted into the military. Other changes happening in 1965 were the split of Fullerton Union High School and FJC (LAT 1965a, 1965b, 1967a).

In 1965, FJC received the green light for expansion plans that would shape the campus’s future with the northern perimeter construction endeavor with the City of Fullerton. The plans would create a new road that would extend from Berkley Avenue, cross Lemon Street, and continue west toward Harbor Boulevard. The 1965 agreement between the City and the District laid the groundwork for FJC’s expansion in 1967 that included the purchase of lots along Chapman Avenue and Lemon Street. The parcels and buildings located at 816 North Lemon Street, 816½ North Lemon Street, 820 North Lemon Street, and 319 Chapman Avenue were successfully purchased by FJC and the buildings were demolished in preparation for the construction of the Music and Theatre buildings (LAT 1965c; Richey et al. 2012).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2.4 Politics and Social Change**

In the 1960s and into the 1970s, FJC students were growing increasingly more political against the backdrop of McCarthyism and the growing anti-communist movement. FJC experienced its own political drama with the release of an “unapproved student publication” titled *The Black Flag: A Journal of Opinions*, which was declared “subversive” (Richey et al. 2012). The District Administration Center was subsequently crammed with over 200 angry parents and local community activists, who demanded that the literary journal be banned from FJC. These types of demands continued throughout the decade, along with new demands to close certain courses, fire specific District employees or faculty members, and allow students to attend anti-communist courses off campus during regular class time. In 1961, a popular FJC welding instructor named Wendell B. Phillips Jr. was dismissed, for reasons cited as his membership in the Communist Party and refusing to discuss the political activities of his fellow faculty members (Mudrick et al. 2015).

Faculty members continued to feel shut out from all policy-making decisions on campus and found themselves with almost no opportunity to speak honestly or partake in any organization with a minority viewpoint for fear it would elicit controversy. In the 1960s, the District officially merged with other nearby college districts to form the North Orange County Junior College District, later changed to the North Orange County Community College District (District) (Richey et al. 2012).

### **3.2.5 Economic Uncertainty**

In June 1971, the District Board of Trustees approved the new Master Plan for FJC, which called for the rehabilitation of three buildings—the Business Education, North Science, and Art–Home Economics buildings—as well as construction of new facilities, including a multi-use stadium/outdoor amphitheater. Unfortunately, a lackluster economy prevented new building projects from being approved to move forward. Although existing buildings were eventually refurbished, FJC focused on smaller projects such as new lighting in the parking lots, new tennis courts, expansion of the Print Shop, new air-conditioning units for several buildings, updated athletic facilities, and the addition of a new Reading Center, Women’s Center, Veterans Affairs Office, Service for the Disabled Center, Student Affairs Office, Office of Community Services, and Artist-in-Residence Program. In August 1972, the Board of Trustees voted to officially change the name of Fullerton Junior College (FJC) to Fullerton College.

In the latter part of the 1970s, Fullerton College, along with the most of the United States, continued to experience challenging economic conditions. On the heels of the Vietnam War, the country entered a recession, causing a decline in the Fullerton College student population. The Arab oil embargo of 1973–1974 caused a sharp rise in gasoline prices, and the passage of Proposition 13 in 1978 resulted in massive cutbacks and layoffs throughout Fullerton College.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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A 19% cutback in the state budget resulted in over 200 classes being canceled, a reduction in the number of satellite campuses, and dissolution of over 100 positions. The school library was subjected to a 73% budget cut, leaving little funding for new books. In response to the economic crisis, the District implemented student fees for health services and parking. The school's agricultural program was also completely phased out in 1972, and physical education was no longer a required course (Richey et al. 2012).

### **3.2.6 Diversity and Expansion**

Against the backdrop of the budget crisis, Fullerton College students began to question the underrepresentation of minorities in the curriculum. Fullerton College responded by offering an Ethnic Studies Program that included courses such as Black History, Chicano History, and History of Native Americans. Meanwhile, women were beginning to question the offering of courses such as Personal Charm I and II, Grooming and Poise, and Figure Control, and demanded courses that reflected the reality of women entering the workforce in record numbers. In 1973, Fullerton College offered a course called College and Career Opportunities for Women, followed by additional classes in Women's Studies. Fullerton College also began offering classes for the disabled, as well as never-before-seen workshops that reflected a new reality on campus, such as rape prevention, drug and alcohol abuse control, and venereal disease education workshops.

In the 1980s, the Fullerton College Campus was once again feeling pressed for space. Although no new classrooms were added, Fullerton College did make some additions and modifications for new facilities. In 1982, the photography and journalism laboratories were added to the 500 Building, outdated exterior lighting was replaced, old payphones were replaced, and a new telecommunications system linking all 25 buildings was installed. In compliance with Section 504 of the Rehabilitation Act of 1973, Fullerton College made numerous modifications to accommodate wheelchair access. In 1980, Fullerton College purchased the Chapman–Wilshire Schools, which included unused land in the northeastern portion of the property. Fullerton College opted to construct a new Student Services Center on this portion of land. Other new construction on campus included the Child Care building and a greenhouse located at the Horticulture Complex (Richey et al. 2012).

### **3.3 Campus Development and Expansion**

#### **3.3.1 Original Campus Master Plan (1935–1942)**

Campus development at FJC was intertwined with the Fullerton Union High School buildings for many years in its early history, but in 1935 Vaughn ushered in a new era for FJC with his campus plan on the newly acquired 16 acres of land. Vaughn was assisted by landscape architect

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Ralph D. Cornell in his plan and would receive a great deal of WPA and Public Works Administration (PWA) funding for executing the campus plan (Richey 2010):

Having already supervised the construction of all the buildings on the high school campus while working for Carleton Winslow, Vaughn was eminently qualified for his new assignment as college campus architect. Using Public Works Administration (PWA), then Work Projects Administration (WPA) funds, Vaughn designed, then supervised, the construction of all of the new campus buildings... Vaughn also designed the walls for the sunken garden and additional landscaping features (\$47,793), which the WPA funded. Forty-five percent of the building costs were paid by the federal government, with the remainder supplied by the school district.

Typical of the time, Vaughn chose Spanish Colonial Revival as the architectural style for the early campus buildings, and the layout was greatly influenced by Thomas Jefferson's plan for the University of Virginia. As shown in Figure 6, Vaughn oriented the buildings facing a large central greenspace with shared services buildings, like the library and student services, in the center. The WPA also provided Vaughn and FJC with the funding for the construction of a greenhouse and for landscaping. With this funding, the Horticulture students of FJC were able to grow plants to place throughout the campus, accenting Vaughn's plan (see Figure 7 for an aerial view of the FJC Campus in 1940). Although 12 buildings were planned and designed by Vaughn, only the Commerce building, Administration building, Technical Trades building, Student Union building, and Greenhouse building were constructed and still stand today (Richey 2010; Epting 2014; LAT 1935).



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

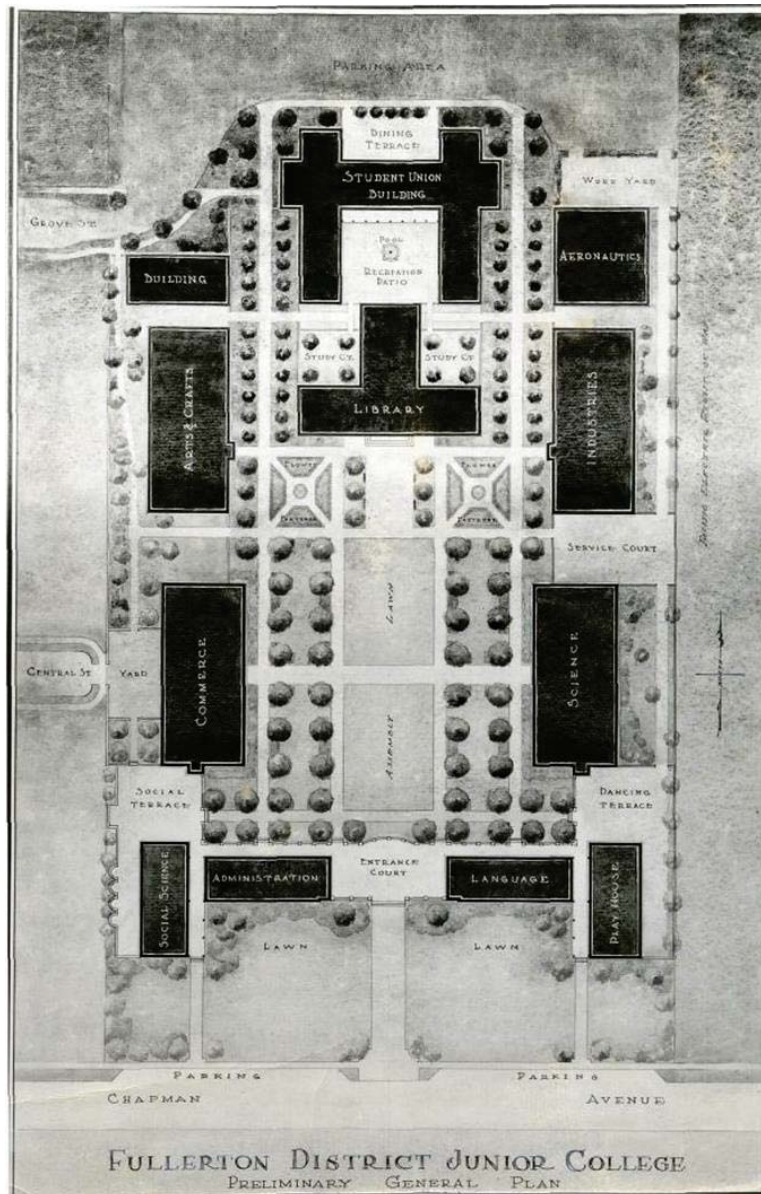


Figure 6. Vaughn's preliminary campus plan

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 7. Aerial photograph from 1940 showing the FJC Campus and Vaughn's many accomplishments during his time with FJC (Richey et al. 2012)**



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Business Building 300 (1936)**

The original Commerce building (Building 300) was the first building constructed as part of Vaughn's general plan (Figure 8). It was built in 1936 at a cost of \$148,777 with PWA funding. According to Sanborn maps from 1949, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. The original interior of the building had a gymnasium, student bank, and multiple classrooms for 50% of the student body to attend classes. Classes taught at the original Commerce building included banking, finance, secretarial courses, English, and many more. Currently the building is used by Fullerton College for Business and Computer Information classes (Richey et al. 2012; Sanborn 1949; Morris et al. 2004; LAT 1936a, 1936b, 1990).



**Figure 8. 1939 photo of Commerce building**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Administration Building 100 (1938)

The Administration and Social Sciences building was designed and constructed in 1938 for \$163,633 with PWA funding (Figure 9). The building is the second building designed and constructed by Vaughn as part of his campus plan. According to Sanborn maps from 1949, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. The original functions of the building included classrooms, administrative offices for FJC, and a student lounge. In the 1950s, FJC hired another architect (Taylor and Conner) to build an addition to the building's front elevation. The modern aesthetic of this new wing was completely incompatible with the Spanish Colonial Revival style of the original building. According to *Fullerton College: A Pictorial History*, Vaughn was so outraged by the modern addition to his original design that he refused to ever work for FJC again. The building is currently known as Administration Building 100 and still functions as the Administration building for Fullerton College (LAT 1937a, 1937b, 1938a, 1990; Richey et al. 2012; Sanborn 1949).



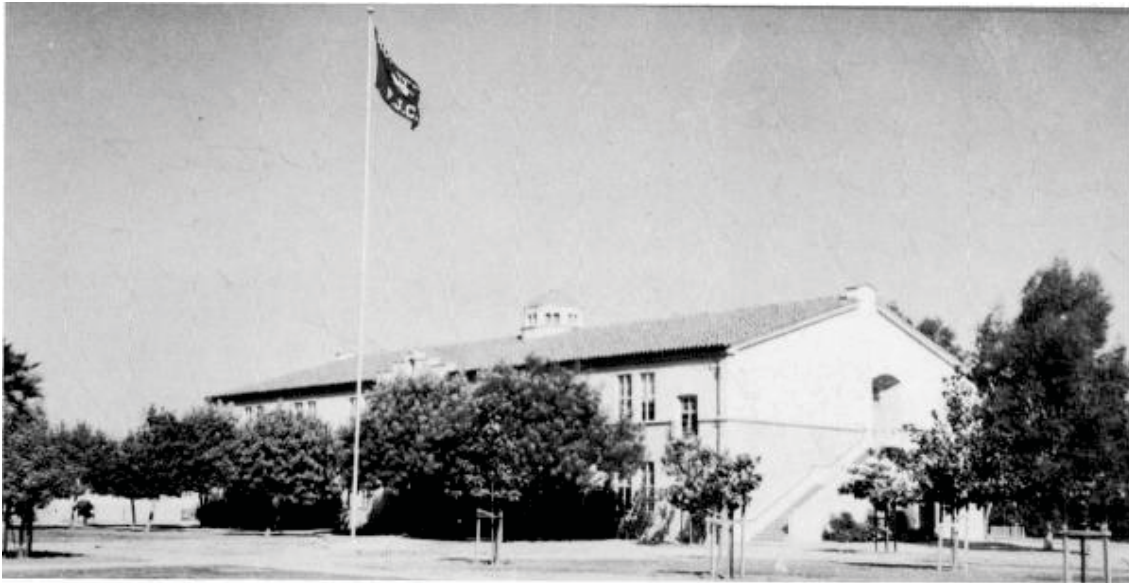
**Figure 9. Administration and Social Sciences building constructed in 1938**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Math Building 600 (1938)**

The Technical Trades building, now referred to as Math Building 600, was constructed in 1938 for \$224,321 from WPA funding (Figure 10). According to the 1949 Sanborn map, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. Although design and construction of the building was done by Vaughn, he was assisted on this building by FJC's building superintendent, William (Willy) B. Potter. Because the function of the building was Technical Trades, Vaughn was required to take extra care in the design of the structural system so that the foundation and floors did not fail once the weight and vibration of heavy machinery was introduced. Once finished, the building was used for technical trade education in welding, cabinet making, and architecture. There were traditional classrooms and shop areas throughout the building for the various trades (LAT 1938b, 1939a, 1990; Richey et al. 2012; Sanborn 1949). In 1980, a bridge was added to the south elevation of the building connecting Building 400 and Building 600. This addition is no longer extant.



**Figure 10. Technical Trades building constructed in 1937**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Greenhouse Building 401 (c. 1937)

Greenhouse Building 401 was constructed c. 1937 with WPA funding (Figure 11). The Greenhouse was an interesting mix of educational space and campus landscaping growth and development. The WPA funding also allowed for additional landscaping on the grounds. The students cultivated plants in the Greenhouse for use in their classes, but also helped the school by using plantings around the Commerce building. The creation of the Greenhouse and the WPA funding for additional landscaping was essential in the beautification of the FJC Campus and sparked this comment in a 1943 yearbook:

Inspirational beauty is the key note to the landscaping of the Fullerton campus. A vast expanse of lawn, lovely flowers, and many newly planted trees make a perfect background for the magnificent buildings of Spanish stucco. The brilliant sunshine brings every color vividly to life, the green of the grass, the tan of the buildings and the red of the roofs (Richey et al. 2012).



Figure 11. Interior of Greenhouse, c. 1937



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Campus Services Building 840 (1940)**

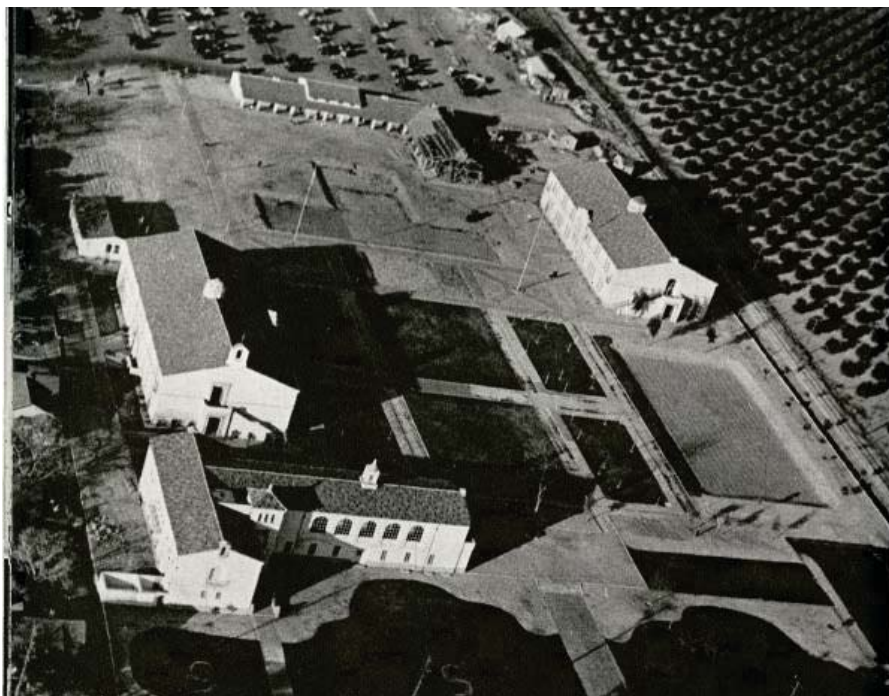
The Student Union building (Building 840) began as a two-phased construction project in 1939 that was completed in 1940 for \$60,454 with WPA funding (Figure 12). Its original design was to house lockers and restrooms for FJC. The first section of the building was a one-story wood-and-stucco building that was rectangular in plan. The second phase of construction was for another rectangular section set perpendicular to the first section to the east, creating an L-shaped plan. In 1941 the building became U-shaped in plan with the addition of the Hornet Hive building, which was constructed as a café for the students. This is consistent with the 1949 Sanborn map, which shows the Student Union as a U-shaped building with the original section from 1939 creating the base of the U shape (Figure 13). The building was used for food services, locker rooms, publications, office space, and the campus bookstore (LAT 1939b; Richey et al. 2012).



**Figure 12. Student Union building under construction in 1939**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 13. 1940 Aerial photograph showing the second phase of construction on the Student Union building**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### T Shacks (1946)

The increased enrollment following WWII brought about space shortages on the FJC Campus. One solution to resolve space issues was the acquisition of war surplus buildings from the Santa Ana Army Air Base in 1946. Known as the “T Shacks” (Figure 14), the buildings were originally used for administrative purposes and as barracks by the military, but were no longer needed by the end of the war. The T Shacks were acquired by FJC in 1946 and according to the 1949 Sanborn map, they were located to the north of the Shops building and the Commerce building. These temporary classroom buildings allowed FJC to make it through the post-war years until government funding for new buildings was released and also allowed for the shifting of more college-level courses away from the Fullerton Union High School site. Although these buildings were meant to be a temporary fix for the classroom shortages, they remained on the FJC Campus for decades. All of the T Shacks except one were removed from the campus in May of 1961. The remaining T Shack was relocated to the north side of the campus for the agricultural program, which is the current Horticulture Complex (LAT 1955a, 1961a, 1961b; Mudrick et al. 2015; Richey et al. 2012; Sanborn 1949).



Figure 14. T Shacks used for classroom spaces starting in 1946

### 3.3.2 Taylor and Conner’s Campus Expansion Master Plan (1953–1965)

With a growing post-war population, residents of the City of Fullerton approved tax increases and bond measures in support of the development of new schools and the expansion of existing

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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campuses. FJC hired Pasadena architectural firm Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) to design a new master plan for the campus in 1953. This led to a number of new building projects on the FJC Campus, all under the architectural design of William H. Taylor, including a new Science building, Gymnasium, Library, Student Center, Technical Education building, Art–Home Economics building, Applied Arts building, and District Administration Center. In 1955–1956, the firm also designed an architecturally incompatible wing to the Administration and Social Science building, which attempted to blend the new modern style with the original Spanish style.

Taylor and Conner’s original design was for a campus-wide master plan that, in addition to multiple new buildings, included drastic changes to landscape and hardscape features. Plans called for a more streamlined look, including the addition of concrete walkways throughout the campus. Although new landscaping was added during the redesign, the number of plants, trees, and shrubs was drastically cut. As stated in *Fullerton College: A Pictorial History*, this “gradually changed the look and feel of the campus” (Richey et al. 2012). Although the construction of these buildings was much needed in terms of new classroom space/educational facilities, they intruded on college’s original Spanish Colonial Revival design, and have been viewed in a negative light by many, as recounted in *Fullerton College: A Pictorial History*:

Over the decades, the campus buildings designed in the 1930s by Harry K. Vaughn and built with federal relief funds had withstood the test of time and become eligible for listing on the National Register of Historic Places. The buildings designed by Taylor and Conner following World War II, however, were in a serious state of disrepair and no longer suited the needs of the campus. The decision was made to demolish many of the post-World War II structures and replace them with Hispano Moresque-styled buildings compatible with the historic Spanish Colonial Revival buildings constructed in the 1930s and 1940s. The result was a harmonious blending of the old and new, with the diversity of architecture making the campus more enjoyable and enriching (Richey et al. 2012).

When original 1930s FJC Campus architect Harry K. Vaughn visited the campus after the remodel, it is said that he was furious about the changes to the campus and vowed to never work with FJC again. Research indicates that many of the original Taylor buildings from the late 1950s and early 1960s have since been demolished. Extant Taylor buildings seen on the Fullerton College Campus today include the Berkeley Center (1960), the Music and Theatre Arts buildings (1967), the Art–Home Economics building (1959), the Technical Education building (1960), and various modifications to the 1930s buildings (LAT 1960; Mudrick et al. 2015; Richey et al. 2012).



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Science Building (1954) – Demolished in 2010**

The Science Building (Figure 15) was the first building constructed under Taylor and Conner's plan. The two-story building was clad in stucco and rectangular in plan, featured regular fenestration, and was oriented with its main elevation facing the campus quadrangle. The building was later connected to the Technical Trades building by a pedestrian bridge. The building was the first building on campus to be used solely for mathematics and science, which had historically been taught at the Fullerton Union High School campus and not on the FJC Campus. Plans for the Science Building signed by Blurock indicate that the building was expanded in 1966. The building was demolished in 2010 to make way for the new Science Building 400 that stands today (LAT 1954b, 1954c; Richey et al. 2012).



**Figure 15. Science building, 1955**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Physical Education Building 1200 (1955)**

The Gymnasium (Figure 16) was the second building constructed under Taylor and Conner's plan in 1955. The building was noted as being the first building constructed on campus that would allow all physical education classes to be taught on the FJC Campus instead of the shared high school campus. The original building contained multiple basketball courts, locker rooms, instructional areas, and spectator seating areas. In 1956, a swimming pool and student health center were added to the building. Today the original building forms the core of the section now called the North Gym (LAT 1953, 1954d, 1954e, 1955b, 1958a, 1961c, 1962a; Richey et al. 2012).



**Figure 16. Gymnasium building constructed in 1955**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Library (1957) – Demolished in 2003**

The two-story, reinforced-concrete library was constructed in 1957 (Figure 17). The building was irregular in plan and clad in stucco, with a complex roofline. The interior of the building included a beautiful two-story atrium and was used for a variety of functions, including studying, typing, and language listening, and also housed a faculty lounge. The building was demolished in 2003 for construction of the new library building, now referred to as the Library and Learning Resource Center Building 800 (LAT 1955c, 1957a, 1957b, 1962b, 1962c; Richey et al. 2012).



**Figure 17. Library constructed in 1957 and demolished in 2003**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### **Student Center (1957) – Demolished in 2007**

The two-story Student Center building was constructed in 1957 (Figure 18). The building was 11,040 square feet, irregular in plan, and clad in stucco, with a complex roof featuring a series of flat-roofed sections at varying heights. The interior was configured with a large lounge area that was 58 feet by 94 feet, with a stage at one end, so that the building not only could be used for reading and studying but could also accommodate performances and assemblies for the students. The remainder of the building was used for offices and storage. The building was demolished in 2007 and a new Student Center was constructed in approximately the same location. The current building is known as the College Center Building 200 (LAT 1955c, 1957a, 1957c; Richey et al. 2012).



**Figure 18. Student Center constructed in 1957 and demolished in 2007**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Technical Education Building 700 (1959)

The fifth building constructed under Taylor and Conner's plan was the Technical Education building (Building 700) in 1959 (Figure 19). The original design of the building included classrooms and work areas for technical trades such as welding, drafting, fabrication, and cosmetology. The Technical Education building is also noted as the first building that allowed for parking in front of the building. It was remodeled heavily during the 2000s and retains very little of its original visual elements (LAT 1958b, 1958c, 1959a, 1959b; Richey et al. 2012).



**Figure 19. Technical Education building constructed in 1959**



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Fine Arts Gallery 1000 (1959)**

The Art–Home Economics building (Building 1000) was constructed in 1959 (Figure 20). The original design of the building included classrooms and work areas for home-economics-related coursework such as table setting, home management, childhood development, cooking, and entertaining. The building was in keeping with the modern style that Taylor and Conner used for the other buildings on the FJC Campus. It was remodeled heavily during the 1970s with interior alterations (LAT 1959b; Richey et al. 2012).



**Figure 20. Art–Home Economics building view from top of Gymnasium**

### **Berkeley Center 3000 (1960)**

The District Administration building (Building 3000) was constructed in 1960 north of the main FJC Campus on Lemon Street (Figure 21). The District Administration building housed various administrative offices for the affairs of various schools, including but not limited to FJC (LAT 1959c; Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 21. District Administration building constructed in 1960**

### **Humanities Building 500 (1962)**

The Applied Arts building (Building 500) was designed by Taylor and Conner in 1962 (Figure 22). The two-story building was designed primarily as classroom space with a few offices. Subjects taught in the building included medical assisting, dental assisting, journalism, psychology, and merchandising. German, French, Spanish, and Russian classes were also taught in the Applied Arts building. It is also important to note that the Applied Arts building was one of the first buildings at FJC to have air-conditioning units. Today the building continues to be used for Applied Arts and Humanities studies. It also serves as the Humanities Division office and the Veterans Resource Center (Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 22. Applied Arts building constructed in 1962**

### **Music Building 1100 (1967)**

The last buildings constructed on the FJC Campus under the Taylor and Conner plan were the Music and Theatre buildings. The Music building (Building 1100; Figure 23) was designed for rehearsals as well as instrument storage and classroom space. The building included a stage, practice rooms, classrooms, storage and repair rooms, a uniform and robe room, and dressing rooms. The construction of the Music building allowed the music instruction at FJC to be shifted from the high school to the FJC Campus. Although research indicates that this building was under construction when FJC replaced Taylor and Conner in 1965, the architectural plans on file suggest that the building was completed with Taylor's designs and the Music and Theatre buildings were the last of Taylor's designs to be built on the FJC Campus. Today the building is still used as the Music building and also houses the Fine Arts Division office (LAT 1963a, 1963b, 1964a, 1964b, 1965d, 1966a; Richey et al. 2012).



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 23. Music building constructed in 1967**

### **Theatre Arts Building 1300 (1967)**

The Theatre building (Building 1300; Figure 24) was constructed at the same time as the Music building by Taylor and Conner. The building included a sound/projection booth, four dressing rooms, an auditorium, and basement storage for set dressing items. Although research indicates that this building was under construction when FJC replaced Taylor and Conner in 1965, the architectural plans on file suggest that the building was completed with Taylor's designs and the Music and Theatre buildings were the last of Taylor's designs to be built on the FJC Campus. Today the building is referred to as the Theatre Arts building and houses the Campus Theatre and Box Office (LAT 1963a, 1964b, 1965d, 1966a; Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 24. Theatre building constructed in 1967**

### **3.3.3 Blurock's Campus Expansion Projects (1965–1984)**

In 1965 FJC made the decision to terminate its agreement with Taylor and Conner and move forward with hiring William E. Blurock as the FJC Campus architect. Blurock's first contribution to the FJC Campus was the construction of an addition to the Library building. By the time Blurock began his tenure at FJC, the 1957 Library had outgrown its building and more space was required to meet the increasing enrollment numbers. Blurock completed the library addition by 1968. Blurock was also responsible for an addition to the Science building and renovations and additions to numerous other buildings on campus. During the 1960s and 1970s, FJC grew and expanded based on the needs of the students and of the industries that would be recipients of FJC graduates. Blurock completed numerous renovations to the existing buildings on the FJC Campus but was also responsible for the buildings described in this section during his time at FJC (LAT 1965e, 1966b, 1966c, 1967b, 1971a, 1971b; Richey et al. 2012).

#### **Child Development Center Buildings 1800 Complex (c. 1980)**

The Child Development Center Complex (Figure 25) was constructed c. 1980 and featured relocatable buildings combined with a section of new construction used to create an L-shaped plan for the building.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 25. Child Development Center Complex**

### **Media Services/Academic Computing/Maintenance and Operation Shops Building 2300 (c. 1970)**

According to architectural plans from the North Orange County Junior College District Division of Physical Plant and Facilities from July 1970, the Math Audio–Tutorial building (Building 2300) was a one-story relocatable building (Figure 26) that was renovated to serve as a building for the Mathematics and Engineering Division. The building was relocated to the west of the 500 Building and is currently used for the Media Services, Academic Computing, and M&O Shops.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 26. Math Audio–Tutorial building constructed c. 1970**

### **Student Services Building 2000 and Pedestrian Bridge (1984)**

The Student Center design and construction began in 1982 and was completed in 1984 by Blurock's firm. The Student Center (Building 2000) was located in the recently acquired tract of land purchased by Fullerton College in 1980. Due to the location of the Student Center, Blurock's firm also designed a connector bridge to cross Chapman Avenue (Figure 27). The building was designed to house a Bookstore, Disabled Student Services office, and Career Center, as well as the Admissions Department and the Bursar's office. Today the building houses the Admissions and Records, Bookstore, Bursar, Career and Life Planning Center, Counseling, Distance Education, and Extended Opportunity Programs and Services/Cooperative Agencies Resources for Education (EOPS/CARE) (Richey et al. 2012).



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 27. Pedestrian Bridge and Student Center constructed in 1984**

### **3.3.4 Chapman and Wilshire School Acquisition (1980–1984)**

In 1980, the District acquired the Chapman School and Wilshire Junior High School (Wilshire School), located across the street on the south side of Chapman Avenue. The District renovated the buildings and turned them into the Wilshire Continuing Education Center in 1983. Once renovations were completed, the school started operations in the buildings in 1984. The purchase of the schools came with undeveloped land that Fullerton College intended to use for further expansion and development, including the construction of a new Student Center in 1984 designed by Blurock (Richey et al. 2012).

Although the Wilshire School buildings are the only buildings remaining on the plot to the south of Chapman Avenue, there was another school located beside the Wilshire School known as the Chapman School. According to a 1949 Sanborn map of the area, the Wilshire and Chapman Schools were multi-building school complexes arranged on a large parcel of land to the south of FJC. The Chapman school grounds were composed of a large one-story school building with an L-shaped plan, a roughly rectangular one-story building to the east labeled as Kindergarten, a playground to the east, and a one-story cafeteria building (Sanborn 1949).

The Wilshire School is also shown on the Sanborn map from 1949 as a three-building school complex. The Wilshire School appears to be oriented toward Wilshire Avenue, with two one-story classroom buildings that appear to be rectangular in plan and connected by an open

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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walkway between the buildings. To the north of the classrooms stands a building labeled Auditorium, which is the Wilshire Theatre (Sanborn 1949).

According to a California Department of Parks and Recreation (DPR) Historic Resources Inventory Form from 1979, the following information was recorded about the Wilshire Junior High School property:

Wilshire Junior High School bounded by Lemon, Chapman, Lawrence, and Wilshire is the latest building in an area which has been in continuous use for educational institutions since 1889. The first was a small red brick school house, constructed a year after the formation of the Fullerton Elementary School District near Lemon & Wilshire. The structure was in constant use and was modernized through the years until 1914 when it was replaced by a new, twelve-room building, the Wilshire School. By this time enrollment had increased from 333 in 1906 to 470. In 1919 the School District acquired the rest of the land around Wilshire School and in 1921, Chapman School, at the corner of Lemon and Chapman, was built. By 1924 two additional elementary schools, Ford and Maple had been constructed elsewhere in town, and average daily attendance in the District had increased to 1,336. The 1933 earthquake caused severe damage to this complex and in 1934 it was deemed necessary to make repairs and reconstruction. The Chapman School was restored and one classroom added for a total of 14 classrooms, and Wilshire School was totally demolished. The building was replaced by a new structure and an auditorium was built between it and Chapman School, joined by an archway. Wilshire School area was the location for a soup kitchen during the Depression (DPR 1979).

The current Wilshire School buildings were designed by Donald Beach Kirby in 1936 using PWA funding. The original Wilshire School was heavily damaged during the earthquake in 1933 and was unable to be saved. Kirby's new school buildings dominated the block between Chapman Avenue and Wilshire Avenue, as shown in the aerial photograph from 1938 (Figure 28). Today three buildings remain from Kirby's original designs: the Wilshire Theatre, 100 Wilshire Avenue, and 200 Wilshire Avenue. The school shut down in the early 1980s and the District purchased these buildings and renovated them for use as an Auditorium and Continuing Education Center (Epting 2014; LAT 1983).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 28. 1938 Aerial photograph looking southeast, showing the Wilshire School buildings (circled) to the south of the FJC Campus and Fullerton Union High School campus**

### **Wilshire Theatre Building 2100 (1936)**

The school purchase included the Wilshire Theatre (Figure 29), which was constructed in 1936 using PWA funding. The building was designed in the PWA Moderne style by architect Donald Beach Kirby (1905–1980). According to the 1949 Sanborn map, the Auditorium building was between the Wilshire School and the Chapman School and oriented with the entrance to Harvard Avenue. The Sanborn map shows the building as a two-story building that was constructed using fireproof reinforced concrete and a steel truss roof system. The map also notes a large stage area to the east side of the building's interior and a boiler room to the rear of the building. According to information provided in *Fullerton College: A Pictorial History*, "The auditorium was the first project approved for construction using federal Depression-era relief funds in Orange County" (Richey 2010; Richey et al. 2012; Sanborn 1949).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 29. Wilshire Theatre**

### **Wilshire School Building W100 (1936)**

The Wilshire School Building 1 was constructed in 1936, is located on the corner of Wilshire Avenue and Lemon Street, and is now known as the W1 Building or the 100 Wilshire Building (Figure 30). According to the information available from the 1949 Sanborn map, this building was a one-story building constructed in the PWA/WPA Moderne style and was originally part of the Wilshire School. The building functioned as a junior high school until it closed in the early 1980s. The District now uses the building for Continuing Education. The interior of the building has been renovated multiple times over the years, but the exterior retains much of its original PWA/WPA detailing.



**Figure 30. Wilshire School Building 1**

### **Wilshire School Building W200 (1936)**

The Wilshire School Building 2 was constructed in 1936, is oriented to face Wilshire Avenue, and is connected to Wilshire School Building 1 by a porte cochère. The building is currently



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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known as the W2 Building or the 200 Wilshire Building. According to the information available from the 1949 Sanborn map, this building was a one-story building constructed in the PWA/WPA Moderne style that was originally part of the Wilshire School. The interior of the building has been renovated multiple times over the years, but the exterior retains much of its original PWA/WPA detailing. No historic photographs of this building were located.

### **3.3.5 Chapman Avenue Residential Acquisitions (1980s, 1990s)**

During the 1980s and 1990s, Fullerton College acquired residential properties to the south of the main Fullerton College Campus on Chapman Avenue as part of their campus expansion plan. The residential properties located south of Chapman Avenue were originally multi-family or single-family residences that maintain their original uses or remain vacant. The only alterations made to the vacant properties were boarding up entry points to prevent vagrancy. Three of the residential properties were previously evaluated by GPA in 2015 and do not require additional evaluations for the purposes of this study. The previously evaluated buildings include 428 East Chapman Avenue, 434 East Chapman Avenue, and 438 East Chapman Avenue. Dudek evaluated all remaining properties on the project site, which include 325–327 North Newell Place, 409 North Newell Place, 416 East Chapman Avenue, 418 East Chapman Avenue, and 420 East Chapman Avenue. The City of Fullerton and the Orange County Assessor's office were unable to provide information on the properties in question. Visits were made in person to the Assessor's office and Permits office on March 22, 2017, and all possible building information was obtained at that time. City Directories for the City of Fullerton were accessed in person at the Fullerton Public Library Local History Room on March 22, 2017.

## **3.4 Campus Architectural Styles**

### **3.4.1 Spanish Colonial Revival (1915–1940)**

The Spanish Colonial Revival style has a rich history and popularity in California with a basis in Spanish architectural forms that were heavily influenced by the richness of the history of Spain. One huge influence on the history of Spain is the Moors. The Moors were in control of Spain for many years and made a truly significant impact on the architectural development in many Spanish cities like Seville. The Moors brought with them a rich Muslim tradition that was based on the Islamic patterns of development seen throughout the Middle East (NGS 2017). The combination of the Spanish and Moorish influence became known as the Hispano-Moorish (also referred to as Hispano-Moresque) architectural style. The height of Hispano-Moorish architecture in the Iberian Peninsula was from the 8th century to the 15th century and there was a significant revival during the 19th and early 20th centuries throughout Europe and the Americas (Curl 2006).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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During the Spanish colonial period in the late 1400s the architectural traditions known as the Hispano Moorish style were brought to the Americas. The convergence of Christian and Islamic traditions seen in America is most often referred to as Mudèjar. The convergence of religious and architectural traditions during the Spanish Colonial period set the stage for the Spanish Colonial Revival architectural movement that gained great popularity in the 1920s and 1930s in Southern California (Khalidi, SIC 2017, SOHO 2007).

Deeply rooted in Spanish and Islamic traditions, Hispano-Moorish architecture became a uniquely Southern California tradition following the 1915 Panama-California Exposition in San Diego. Drawing not only from the rich heritage of Southern California and building on the traditions of the incredibly popular Mission Revival movement, architect Bertram G. Goodhue chose to elaborate and ornate the style to new levels with his interpretation of the Spanish Colonial principles and precedents from both Spain and Mexico. The elaborate ornament used by Goodhue and the Spanish Colonial Revival architects he influenced was specifically referred to as Churrigueresque (Bevil 1995, SIC 2017, SOHO 2017). Goodhue's use of the Spanish Colonial Revival style with Churrigueresque ornament at the 1915 Exposition was an inspiration to architects and designers throughout California. While revivalist styles were popular throughout Southern California, some cities like Fullerton embraced the Spanish Colonial Revival style above all others. The City went so far as to make Spanish Colonial Revival its preferred form of architecture for commercial and civic buildings in the 1920s (McAlester 2015; FH 2008; SDHC 2017).

The most significant character-defining features of the Spanish Colonial Revival style include the following:

- Low pitched roofs with clay tiles
- Stucco walls
- Simple rectangular or L-shaped plans
- Asymmetrical façades
- Churrigueresque detailing and features around windows and entryways
- Arched entryways
- Irregular fenestration
- Elaborately carved wood entry doors
- Wrought-iron balconies
- Interior decorative tile work

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Arcaded walkways
- Recessed doors and windows

Due in large part to the City's preference for the style, Fullerton's most notable commercial/civic examples of the style are the Masonic Temple built in 1920 and the California Hotel built in 1922 (DSD 2002; Foster 330-333; McAlester 2015). According to Fullerton Heritage, the City also retained many residential examples of the Spanish Colonial style, including the following:

- Muckenthaler Estate, 1923
- The Grieves Apartments, 1924
- Clinton Smith House, 1924
- William Winter House, 1926
- Gowen House, 1928
- Dewella Apartments, 1929
- Foster House, 1929
- Cleaver House, 1929

Examples of Spanish Colonial Revival style architecture on campus include the following buildings. Note that the Spanish Colonial Revival Style buildings on the Fullerton campus also exhibit architectural details that reflect the Churrigueresque style of architecture, including scalloped entrances, horseshoe arches, and tile work.

- Business Building 300
- Greenhouse Building 401
- Math Building 600
- Administration Building 100
- Student Union Building 840

### **3.4.2 Craftsman (1905–1930)**

The Craftsman architecture movement in the United States is one of the most prevalent and widespread movements, which appealed to almost all social classes. One of the most notable architectural developments arising from the Craftsman movement is the Bungalow. The Arts and Crafts movement began in the mid-late part of the nineteenth century in England as a reactionary movement against the excessiveness and ostentatious designs of the Victorian era. One of the key contributors to bringing the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Craftsman movement to the United States was Gustav Stickley. His work and efforts helped fuel the development of the Craftsman movement and spread it across the United States. Upon its arrival in California, the Craftsman movement produced a truly unique California architectural form: the California Bungalow. Developed by the work of Greene and Greene in Pasadena, the California Bungalow became one of the most widespread architectural movements in California.

The adaptation of the Greene and Greene Bungalow model for the masses contributed to its appeal and application to meet the needs of the housing booms happening across California following World War I. Even though Greene and Greene designed very high-style versions of the California Bungalow, builders and contractors began to mass-produce designs for the homes in pattern books and made them more available to the public.

The California Bungalow is characterized by the following features:

- Overhanging eaves
- Distinct horizontal lines
- Low pitched roof designs
- Wood shingle detailing, porches
- Maximum of two stories, mostly one story or one-and-a-half stories
- Paired windows
- Craftsman style doors
- Tapered wooden porch supports
- Extensive use of natural materials and finishes
- Brick and/or stone chimneys
- Exposed roof beams

Although the Greene and Greene bungalows represent the highest artistic and pure forms of the movement, it is in the modest application that cities like Fullerton were able to latch onto the high-style tradition and make it their own (DSD 2002; Makinson 1977; McAlester 2015; SurveyLA 2016). Buildings within the project area that exhibit characteristics of the Craftsman style include:

- 325-327 North Newall Place
- 420 East Chapman Avenue
- 428, 434, and 438 East Chapman Avenue

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.4.3 PWA/WPA Moderne (1933–1944)**

During the Great Depression and the years shortly thereafter a new architectural form emerged called PWA Moderne. Under New Deal initiatives from President Roosevelt, the Works Progress Administration (WPA) and the Public Works Administration (PWA) were created. Like other New Deal programs, the WPA and the PWA were focused on creating American jobs in the Depression Era. The WPA was responsible for providing government relief to cities for materials and labor, whereas the PWA was established to provide funding for private contractors for public works projects, including but not limited to bridges, civic buildings, airports, schools, hospitals, and dams. Both programs were essential in the development of the PWA/WPA Moderne style of architecture and for putting many people back to work during the economic crisis.

Given the economic state of the country, it makes sense that the PWA/WPA Moderne style would be somewhat simplistic in nature and use readily available materials to keep project costs low. In addition to simplicity and readily available materials, the PWA/WPA Moderne style has the following character-defining features:

- Use of conservative elements and materials such as concrete
- Monumental feel
- Rectangular massing
- Zigzag ornamentation
- Balanced and symmetrical forms based on Classical design principles
- Windows arranged as vertical recessed panels
- Stucco or stone walls

The Wilshire School buildings, which are now part of the Fullerton College Campus, serve as good examples of the PWA/WPA Moderne style. It is also notable that the Wilshire Theatre building was the first PWA building constructed in Orange County (DSD 2002; Epting 2014; Morris et al. 2004).

### **3.4.4 Mid-Century Modern (1933–1965)**

Following WWII, the United States had a focus on forward thinking, which sparked architectural movements like Mid-Century Modern. Practitioners of the style were focused on the most cutting-edge materials and techniques. Architects throughout Southern California implemented the design aesthetics made famous by early Modernists like Richard Neutra and Frank Lloyd Wright, who created a variety of Modern architectural forms throughout Southern California.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The Mid-Century Modern movement in Fullerton, as in other cities in the United States, was characterized by simplistic and clear uses of materials and structural components, open interior planning, and large expanses of glass. Mid-Century Modern flourished in Fullerton housing forms and in school constructions supporting the post-war housing boom. The cost-effective nature of the style and the ability to mass-produce Mid-Century Modern building materials like concrete, wood, steel, and glass made it the perfect style for growing cities like Fullerton. Today there is a Fullerton Heritage Driving Tour that includes numerous examples of Mid-Century Modern architecture, including the following (City of San Diego 2007; DSD 2002; FPL n.d.):

- Forever Houses, 1954
- Nicolas Junior High School, 1956
- C. Hunt Foods Foundation Library, 1962
- D. Fern Drive Elementary School, 1954
- E. Golden Hills Elementary School, 1950

Characteristics of the Mid-Century Modern style include the following:

- One to two stories in height
- Post-and-beam construction using wood and/or steel
- Cantilevered canopies and overhangs
- Little to no exterior ornamentation
- Simple lines and geometric patterns
- Emphasis on function and simplicity
- Open floor plans
- Buildings sheathed in stucco, wood, brick, or steel frame with glass
- Flat roof designs
- Flush-mounted metal frame and clerestory windows
- Large expanses of windows
- Simple size and massing
- Use of simplistic geometric shapes
- Use of covered walkways with geometric canopies using such forms as butterfly or folded plate

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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- Indoor/outdoor integration
- Exterior staircases, decks, patios, and balconies

Examples of Mid-Century Modern buildings on the Fullerton College campus include:

- Physical Education Building 1200
- Fine Arts Gallery 1000
- Berkeley Center Building 3000
- Humanities Building 500
- Theatre Arts Building 1300

### 3.4.5 New Formalism (1954–1970s)

In the City of Fullerton, the New Formalism movement emerged in the 1950s and lasted until the early 1970s. The New Formalism movement emerged as a reactionary movement against the International style. Some of the most acclaimed architects of the style are Edward Durrell Stone, Philip Johnson, and Minoru Yamasaki, who all had experience working in the International style but wanted to create a more formal and ceremonial form of architecture that was strongly rooted in Classical design motifs and principles. The design of the New Delhi American Embassy in by Edward Durrell Stone is often noted as the starting point for the New Formalism movement.

Characteristics of New Formalism:

- Incorporation of formal landscapes and central plazas
- Use of classical features such as columns, arches, and colonnades
- Monumental style scale and massing, often set atop a visual podium
- Use of extravagant materials like granite, marble, and travertine
- Symmetrical façade design
- Use of arched supports
- Use of concrete screens

The New Formalism movement had its limitations, in that it was used primarily in large-scale cultural and institutional buildings with little use in other architectural sectors. Examples of New Formalism in the United States include Lincoln Center in New York City, the Los Angeles Music Center, and the Kennedy Center for the Performing Arts in Washington DC.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Smaller cities and universities also embraced the New Formalism style, and examples of the style are seen in Fullerton with the City Hall built in 1963 and the Western University College of Law built in 1975 (City of San Diego 2007; DSD 2002; Gebhard 2003; McAlester 2015). The Fullerton College Music Building 1100 serves as an example of New Formalist style educational architecture.

### **3.4.6 International Style (c. 1925–present)**

The International style of architecture came to Los Angeles in the early 1920s and flourished under architects like Richard Neutra and R.M. Schindler. The style became very popular in almost all forms of architecture, using precise and universal materials and techniques that allowed the style to be used anywhere in the world. The strong Bauhaus roots of the movement incorporated simple and precise designs and incorporated mass-produced materials such as concrete, steel, and glass. Functionality in design was also one of the highest priorities of the style.

Characteristics of the International style:

- Flat roof structure
- Little decoration or ornamentation
- Glass curtain walls
- Open interior spaces
- Smooth wall surfaces, usually clad with stucco
- Strong linear lines
- Large concrete expanses
- Use of modern materials such as metal windows, concrete, and steel
- Flush-mounted metal windows
- Asymmetrical design

The City of Fullerton's International style buildings include the Beckman Instruments Headquarters (1953), Fullerton Community Bank Building (1960), and Hunt Administrative Building (1960) (City of San Diego 2007; DSD 2002; Gebhard 2003; McAlester 2015).



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.5 Campus Architects**

#### **3.5.1 Harry K. Vaughn (1882–1962)**

Harry K. Vaughn (1882–1962) was born in Wisconsin and moved to San Diego in 1906. Shortly after his arrival in San Diego, Vaughn became a draftsman for the architectural firm of Hebbard and Gill. After the dissolution of the Hebbard and Gill partnership in 1907, Vaughn made the decision to stay on with Hebbard as a draftsman. His career continued under Hebbard until 1913, when he went to work for Carleton M. Winslow. With Winslow's appointment to Architect in Residence for the Panama–California International Exposition in San Diego, Vaughn gained valuable experience working with Winslow at the exposition to design many of the temporary buildings. Following Winslow's success at the exposition, he and Vaughn relocated to Los Angeles. While living in Los Angeles, Vaughn obtained his certification in architecture after completing the required coursework at the University of California. While working with Winslow, Vaughn also worked with another noted architect, Irving Gill. Vaughn's first experiences with the FJC began when Winslow was named the Fullerton College architect in 1919. During his time under Winslow, Vaughn designed and supervised numerous construction projects. Vaughn also began to make a name for himself and was hired to design the Louis E. Plummer residence in 1927. The superintendent's fondness for Vaughn likely influenced the Board of Trustees on the decision to hire Vaughn for the new FJC Campus project in 1933.

Following in the footsteps of his previous employers, Vaughn was greatly influenced by the Spanish Colonial Revival style and incorporated it into his designs for FJC. Vaughn designed the following buildings during his time at FJC:

- Business Building 300, 1936
- Greenhouse Building 401, c. 1937
- Administration Building 100, 1938
- Math Building 600, 1938
- Campus Services Building 840, 1940

Throughout Vaughn's time at FJC, he built a following and was asked to take on other architectural projects in the City of Fullerton, including the Fullerton Public Library. A great deal of Vaughn's work was based on WPA funding; once the WPA work was completed, Vaughn returned to San Diego and continued his architectural career with the California Department of Public Works, Division of Architecture (Michelson 2015a; Richey 2010; Richey et al. 2012; Morris et al. 2004; Flanigan 1987).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.5.2 Ralph D. Cornell (1890–1972)**

Ralph D. Cornell (1890–1972) was born in Nebraska and relocated to California in 1908. Following his graduation from Pomona College in 1914, he continued his studies at Harvard University and in 1917 was awarded the degree of Master Landscape Architect. Prior to his service in World War I, Cornell worked as an architect at the firm of Harries and Hall in Toronto, Canada. Upon his return from the war, Cornell settled in Los Angeles and opened one of the very first practices specializing in landscape architecture (Tyack 2011; TCLF 2014; Michelson 2015b). His principal works in California include Hillside Memorial Park Cemetery (1945); Los Angeles Civic Center Grounds (1956); Beverly Gardens Park (1931); Glen Haven Memorial Park (c. 1940); Restoration of Rancho Los Cerritos (1931); Grand Park (1956); Los Angeles Mall (1973–1975); Los Angeles Department of Water and Power Grounds (c. 1959); Pasadena’s Central Park (1927); Pasadena’s Washington Park (1922); Pomona College Grounds (beginning in 1919); Los Angeles Music Center Grounds; University of California, Los Angeles (UCLA) Grounds (beginning in 1937); and Torrey Pines (1922).

His professional architectural firms included the following:

- Cornell and Payne Landscape Architect and Wild Garden Specialist (1919–1924)
- Cook, Hall and Cornell (1924–1933)
- Cornell, Bridgers and Troller (1955–1969)
- Cornell, Bridgers, Troller and Hazlett (1969–1972)

Cornell’s work at FJC began in 1935 when he teamed with Vaughn to create the general campus plan for FJC’s new site. Heavily influenced by the University of Virginia campus, Cornell and Vaughn sought to design a series of pathways, walkways, and open spaces that worked cohesively with the surrounding buildings (Epting 2014).

Cornell’s design aesthetic was restrained and thoughtful of the natural environment. In addition to his numerous residential and public projects, Cornell also served as a landscape architect at Pomona College (1919–1959), UCLA (1937–1972), and University of Hawaii (1928–1972). Another notable point in Cornell’s career was that he was appointed as Landscape Architect Consultant for the Federal Relief Administration in 1935. Cornell’s contributions to Southern California landscape architecture were fundamental to the development of the Southern California landscape (Tyack 2011; TCLF 2014; Michelson 2015b).

### **3.5.3 Donald Beach Kirby, Architect (1905–1980)**

The principal works of Donald Beach Kirby (1905–1980), the architect for the Wilshire School buildings, include the Maharajah of Indore Residence in Santa Ana (1940), Player’s Café in

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Hollywood (1941), Miss Burke's School in San Francisco (1950), Castle Air Force Base in Merced (1953), Post Library Presidio in San Francisco (1958), Hunter's View Public Housing in San Francisco (1955), and Upper Noe Fieldhouse in San Francisco (1955). Born in Denver and educated at the University of Pennsylvania, Kirby came to Los Angeles in 1929 and worked under two accomplished California architects for a few years. Although Kirby's training under Reginald D. Johnson and Gordon B. Kaufmann lasted a short time, Kirby decided to go out on his own in 1933. From 1934 to 1942 Kirby served as the National Housing Administration director. In 1945, Kirby relocated to San Francisco, continued a very successful architectural practice, won awards from the AIA and Association of School of Administrators for his work on the Burke School, and won the Certificate of Distinguished Service from the AIA. During his time in Southern California, Kirby designed the Wilshire Junior High School buildings using WPA funds (AIA 1970; AR 1952; AF 1956; Marsh 1994; Michelson 2015c; Lowe 1986; Priaulx 1957; SDU 1957; SFC 1980; *Who's Who* 1974–1975).

### **3.5.4 William Henry Taylor, Architect (1912–1995)**

William Henry Taylor (1912–1995), a prominent architect in the San Gabriel Valley whose principal works during the mid-century include the Public Bathhouse and Pool in Palmdale (1951); 3164 Brookdale Road in Studio City (1952); Pasadena City College buildings (1954); Whittier Intermediate School (1956); Wilson Junior High School in Glendale (1956); the first FJC Science building, Gymnasium, Library, Student Center, Technical Education building, and Art–Home Economics building (1960); the FJC Applied Arts building (1962); the FJC Administration building expansion (1964); the FJC Music and Theatre Arts building (1966); the FJC Library expansion (1969); residences in the Poppy Peak Drive district in Pasadena (1968); and the Pasadena Unified School District Services Center (1970). In 1953, FJC started its second expansion phase, which continued into the 1960s. The Pasadena architectural firm of Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) was selected by the FJC trustees to develop a new master plan for the campus, with Taylor serving as the buildings' principal designer.

Taylor's work on the Poppy Peak District in Pasadena, California is perhaps one of the best examples of his Mid-Century Modern aesthetic. Taylor, who often partnered with Kenneth Nishimoto on projects, designed the 1615 Poppy Peak Drive residence. As described on the district's NRHP nomination form:

The district is characterized by a density of excellent examples of Modern 20th century residential architecture designed by a range of architects, including internationally renowned masters, nationally influential architects, and regionally and locally recognized architects, who were also responsible for a wide range of projects in Pasadena and Southern California. This diverse group, including Lyman Ennis, James Pulliam; Kenneth Nishimoto, Buff, Straub & Hensman,

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Leland Evison, Harwell Hamilton Harris, Richard Neutra, William Henry Taylor and Robert Cox, among others, is represented by the wide range of expressions of Modern residential architecture from the mid-1930s to the late 1960s. The district is further distinguished in having atypical, early work by famous architects as well as houses that represent their classic “signatures”; the former embodied by Harris’s Laing House, rendered in an International Style not typically associated with his mature work, and the Perkins House by Richard Neutra, a quintessential example of Neutra’s 1950s work (Lamprecht and Paul 2008:5).

The NRHP district nomination form notes that all of these architects “shared the trait of interpreting Modernism individually.” Many of the architects also built houses for themselves or had family members and clients that lived in the residences, including Taylor and his brother. Many of the architects for Poppy Peak had also fought in World War II. Taylor and Nishimoto were such close friends that Taylor accompanied Nishimoto to a Japanese internment camp and attempted to secure his release by assisting as an architect for the war effort (Lamprecht and Paul 2008).

Taylor also served as a member of the Housing Research Council of Southern California with local masters like Whitney R. Smith who served as Chairman, working on a “non profit organization composed of architects, engineers and planners in private practice who are interested in research into all fields of housing, in an effort to reduce costs and raise standards (HRC 1953).”

He was also part of the Pacific Architects Collaborative at 25 S. Euclid Avenue in Pasadena. The group comprised eight principal architects and their associated firms, each with extensive experience in Southern California (Independent Star News 1962).

In the 1960s, building and expansion plans continued with the architectural and design services of Taylor and Conner. Taylor would go on to design several more buildings for the Fullerton Union High School and FJC, including an Auto Shop Facility, an Applied Arts building, a Music building, and a Theatre building (AIA 1962; Richey et al. 2012).

### **3.5.5 William E. Blurock, Architect (1922–2012)**

William E. Blurock (1922–2012) was born and raised in Los Angeles, California. He graduated from the University of Southern California School of Architecture in 1947, despite his studies being interrupted at the onset of WWII. While stationed in Foggia, Italy, Blurock flew 62 missions as a P-38 Lightning Fighter Pilot for the U.S. Army Air Corps 82nd Operations Group, flying over parts of Europe and North Africa. At the end of the war, he stayed abroad for one year to complete coursework at the University of Florence, School of Architecture, before returning to California and completing his degree in architecture (Bissell 2012; Michelson 2015d).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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His professional architectural firms included the following:

- Blurock, Pleger, Hogan and Ellerbroek, Architects, Orange County, California (1952–1959)
- William E. Blurock and Associates, Architects; Principal, William Blurock Associates, Newport Beach, California (1960–1974)
- William Blurock & Partners, Newport Beach, California (1975–1982)
- The Blurock Partnership (TBP), Newport Beach, California (1983–1994)

Examples of his work on other educational buildings in Orange County between the 1950s and 1970s include the following:

- Orange Coast College, Costa Mesa, California: 1950s Facilities Master Plan (association with Richard Neutra/Robert Alexander) and 1970 Facilities Master Plan
- University of California, Irvine: 1965 Original Master Plan, Phases I and IA (association with William Pereira)
- Fullerton College, Fullerton, California: 1970 Facilities Master Plan
- Golden West College, Huntington Beach, California: 1972 Master Plan Update
- Saddleback College, Mission Viejo, California: 1976 Campus Master Plan
- Coastline Community College, Fountain Valley, California: 1978 Facilities Master Plan
- Irvine Valley College, Irvine, California: 1978 Original Facilities Master Plan

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## 4 CULTURAL RESOURCES SURVEY

### 4.1 Methods

Dudek Architectural Historians Samantha Murray, MA, RPA; Sarah Corder, MFA; and Kara R. Dotter, MSHP, conducted a pedestrian survey of the project site on February 20, 2017. The project site includes an entirely developed active college campus and a small residential section across the street from the main Fullerton College Campus on the south side of Chapman Avenue. Although intensive-level archaeological survey methods (i.e., regularly spaced pedestrian transects) were not warranted, Ms. Murray spot-checked areas of exposed sediment throughout. All buildings and structures that were constructed prior to 1972 were photographed, researched, and evaluated in consideration of CRHR designation criteria and integrity requirements and in consideration of potential impacts to historical resources under CEQA. The 45-year rule was established by OHP in recognition of the fact that there is often a lag time between the point at which resources are identified and the date that planning decisions are made on projects. The survey entailed walking all portions of the campus and documenting each building with notes and photographs, specifically noting their character-defining features, spatial relationships, and observed alterations.

Dudek documented the fieldwork using field notes, digital photography, close-scale field maps, and aerial photographs. Photographs of the project site were taken with a Canon Power Shot SD90 digital camera with 12 megapixels and 3× optical zoom; a 20-megapixel Canon EOS Rebel T5i DSLR with an EF-S 18-55mm f/3.5-5.6 IS STM lens; and a Canon Power Shot SX160 IS digital camera with 16 megapixels and 16× optical zoom. All field notes, photographs, and records related to the current study are on file at Dudek’s Pasadena, California, office.

### 4.2 Description of Surveyed Resources

Table 3 provides an overview of all buildings and structures surveyed as part of the cultural resources study, including a photograph of each building, current building name, current building number (if applicable), historic building name (if applicable), year built (if known), a general physical description of the building, and any alterations identified either through building development research or during the cultural resources survey. Dates and details of construction and alterations were confirmed through building development research conducted on the District facilities management website, as well as archival research.

The following buildings are not listed in Table 3 because they are of recent construction and are not proposed for alteration or demolition as part of the proposed project:


- Building 200, College Center/Food Services



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

- Building 400, South Science Building
- Building 800, Library–Learning Resource Center
- Building 900, Auto/Machining/Printing
- Building 1400, Classroom Office Building
- Building 1900, Classrooms and Food Bank
- Building 2100, Sculpture/3D Arts
- Building W3, Wilshire Continuing Education
- Chiller Plant

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Original Campus Master Plan Buildings (Vaughn, 1935–1942)</i>			
<b>100 Administration</b> 	1938	<p>Built as part of the original campus plan by Vaughn, the two-story Spanish Colonial Revival style building with Churrigueresque style elements is irregular in plan, with a square tower jutting upwards at the juncture between the main portion and the south-facing ell. The low-sloped side-gabled roof and hipped tower roof are covered in Mission-style half-barrel clay tiles. Each gable end sports a projection sheltering a small decorative niche with scalloped detailing along the arch intrados. The building is characterized by board-formed concrete on the exterior with Churrigueresque flourishes at the roofline, main entry doors, and second-floor-level French doors. There are multiple entry points, but the original main elevation faced south toward East Chapman Avenue. The original main elevation is obscured by a modern one-story, flat-roof addition with a variety of metal windows. The second story of the main elevation remains visible, and features a series of five large multi-lite metal-framed windows in arched openings. Windows on the original building are wood-framed and of varying shapes and styles.</p>	<p>1957 (Taylor): Addition to south elevation altered original L-shape building plan.</p> <p>1963 (Taylor): Interior reconfiguration, addition of wire glass to windows, and addition of aluminum and glass entry door to south elevation.</p> <p>1987 (tBP/Architecture Inc.): Interior reconfiguration, updates to electrical plans, and updates to interior finishes.</p> <p>2000 (Hill): Seismic upgrades</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2003 (Swanye): Fire Alarm System Upgrade</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>300 Business and Computer Information</b> 	1936	<p>Built as the first building in Vaughn's campus plan, this two-story Spanish Colonial Revival building with Churrigueresque style elements is rectangular in plan and features a low-sloped side-gabled roof clad in Mission-style half-barrel clay tiles. A large octagonal cupola straddles the ridgeline near the center of the roof, with an arch sheltering a bell at the southern gable end and dentil moulding lining the cornice. The main elevation faces east toward the center of campus, with the recessed main entrance having double wooden doors topped by a lunette window. The main entry is emphasized by the use of Churrigueresque design elements, including a stilted arch with fluting above the impost line, three horseshoe-arch windows with elaborate metalwork at the second floor, and a scallop-capped niche flanked by pilasters on a decorative parapet rising from the cornice line. Secondary entry points on each remaining elevation are similarly detailed, but are less elaborate and at a reduced scale. The building was constructed of poured-in-place board-formed concrete, featuring a projecting molded string course capped by a row of stretcher bricks. Fenestration is regular, with two-by-two inoperable casement windows directly above two-by-two operable casement windows presenting as a single window unit. Near either end of the main elevation is a French door, located midway between floors, opening onto a shallow, elliptically-arched concrete bracket and protected by elliptically-arched decorative ironwork. Exterior staircases on either end of the building grant access to the second floor.</p>	<p>1962 (Taylor): Interior alterations, plumbing and mechanical system upgrades.</p> <p>1980 (Blurock): Interior plan reconfigurations; update of finishes; electrical, plumbing and mechanical system upgrades; replacement of plaster ceiling with reflective ceiling.</p> <p>2003 (Swanye): Fire Alarm System Upgrade.</p> <p>2005 (McMurray): Changes to stairs on north elevation.</p> <p>Date Unknown: Addition of a free-standing exterior elevator on the north elevation.</p>





# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>600 Math</b></p> 	<p>1938</p>	<p>The two-story Spanish Colonial Revival building with Churrigueresque style elements is rectangular in plan and features a low-sloped side-gabled roof clad in Mission-style half-barrel clay tiles. A large octagonal cupola straddles the ridgeline near the center of the roof, with two front vertical protrusions at each gable end and dentil moulding lining the cornice. The main elevation faces west toward the center of campus, with the recessed main entrance having a single, wide wooden door beside a hinged partial-width section, topped by a lunette window. The main entry is emphasized by the use of Churrigueresque design elements, including a stilted arch with decorative voussoirs above the impost line and flanked by quoins, three subtly-pointed equilateral-arch windows at the second floor, and a niche flanked by grooved pilasters on a decorative stepped parapet rising from the cornice line. Secondary entry points on each remaining elevation are similarly detailed, but are less elaborate and at a reduced scale. The building was constructed of poured-in-place board-formed concrete, featuring a projecting molded string course capped by a row of stretcher bricks. Fenestration is regular, with two-by-two inoperable casement windows directly above two-by-two operable casement windows presenting as a single window unit. Near either end of the main elevation is a French door, located midway between floors, opening onto a shallow, elliptically-arched concrete bracket and protected by elliptically-arched decorative ironwork. Exterior staircases on either end of the building grant access to the second floor.</p>	<p>1980 (Blurock): Addition of bridge to the south elevation, which was likely removed when the South Science building was demolished.</p> <p>1985 (Blurock): Interior changes included mechanical, plumbing, and electrical, as well as changes to interior finishes.</p> <p>2003 (Swayne): Fire alarm system upgrade.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p> <p>Date Unknown: Addition of free-standing external elevator to the north elevation.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>401 Biological Greenhouse</b> 	c. 1937	The one-story rectangular greenhouse building features a front-gabled glass-and-metal roof. The concrete foundation supports the exterior walls. The lower two feet of the walls are running-bond brick courses, with the upper portion of the walls framed with steel I-beams and infilled with metal-framed lites, some of which open for ventilation and sunlight. A single metal door pierces the east elevation near the northern end. A fenced-in area is located to the east of the building.	Date Unknown: Glass wall lites painted.
<b>840 Campus Services</b> 	1940	A more restrained version of the style observed elsewhere on campus, this one-story Spanish Colonial Revival style building features multiple wings clad with stucco and low-sloped side-gabled roofs covered in Mission-style half-barrel clay tiles. The rectangular west wing was the first section of the building constructed, with the second comprising the rectangular north wing, oriented perpendicular to the first section and joined onto its north elevation to form an L-shaped plan. The west wing, constructed in 1941, created the U-shaped building plan present today. Fenestration consists of single- and double doors, some wood and others metal, typically with one or two lites, and multi-lite metal-framed windows in various sizes, some of which have operable sections within fixed sections. A concrete courtyard fills the area bounded by the U-shaped building on the south side, providing seating area for the café in the west wing	<p>1941 (Vaughn): Hornet Hive building addition created U-shaped plan.</p> <p>1959 (Taylor): Hive Snack Shop added to the patio area.</p> <p>2011: Hive Snack Shop remodeled and renamed Stinger.</p> <p>Date Unknown: Handicap ramps, addition to rear of building; replacement and/or resizing of original doors; addition of security bars on some windows.</p> <p>Date Unknown: Restrooms upgraded.</p> <p>Date Unknown: HVAC units.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1600-1691 Horticulture Center</b> 	c. 1946; relocated to current location 1961	One of the original T-buildings moved onto campus, this one-story building has a low-sloped side-gabled roof coved in composition shingles. The walls are clad in horizontal drop-lap wood siding, and the south-facing main elevation has a central entry point accessed by a set of broad, open, wood replacement stairs. Fenestration is regular, with eight-over-eight wood-framed double-hung windows. The building is one of many in the horticulture section of campus, including various greenhouses and growing buildings, as well as a single-story brick bathroom building.	Dates Unknown: HVAC units, porch construction with railing, handicap ramp to main entry door.
<i>Taylor and Conner's Campus Master Plan (1953–1967)</i>			
<b>500 Applied Arts and Humanities</b> 	1962	The International-style building is rectangular in plan and clad in painted stucco with a flat roof covered in rolled roofing material. The main elevation faces east, and features the recessed main point of entry under a cantilevered flat roof awning. Fenestration is regular with metal-framed windows placed singly or in pairs separated by a narrow mullion. The windows are of various shapes and sizes, but the majority typically have three or four horizontal lites, with the upper lites fixed and the bottom lite being an operable hopper window. The broad expanses of stucco are generally smooth, with subtle vertical grooves accenting the spaces above and below the windows.	<p>1980 (Blurock): addition of free-standing external elevator to the north elevation, interior reconfigurations, and mechanical system upgrades.</p> <p>2000 (Hill): Seismic upgrades.</p> <p>2005 (McMurray): Changes to stairs on south elevation.</p> <p>2006 (Asuncion): Chiller plant upgrade.</p> <p>Date Unknown: Windows on the north portion of the west elevation at ground floor level were painted over.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>700 Technology and Engineering</b> 	1959	<p>The two-story reinforced concrete building is irregular in plan and features a flat roof with raised parapet. The main (south) elevation features a variety of multi-paned metal windows; a recessed entry point left (west) of center; the addition of an elevator on the east side of the elevation; installation of exterior insulation and finish system (EIFS) panels featuring stucco textures reminiscent of the original board-formed concrete buildings; and Spanish Colonial/Mission Revival style detailing that is not original to the building. A series of openings with segmental arches and applied ornament details dominate the elevation.</p>	<p>1964 (Taylor): Interior reconfigurations, mechanical system upgrades.</p> <p>1968 (Taylor/Blurock): Building addition, interior reconfigurations.</p> <p>1980 (Blurock): Addition of elevator and concrete walk to south elevation.</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2003 (Swanye): Fire alarm system upgrades.</p> <p>2012: Interior reconfigurations.</p> <p>2012 (RND): Guardrail and stair installation.</p> <p>Date Unknown: Modern EIFS with board-formed stucco texture.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>3000 Berkeley Center</b> 	1960	<p>The two-story Mid-Century Modern-style educational building is L-shaped in plan. The main (southwest) elevation has an uneven roofline and two sections projecting forward from the main building. The main elevation is clad with broad expanses of alternating brick and stucco; windows are set flush with the stucco cladding between the brick portions. The rest of the building is clad in stucco. The primary front entrance is recessed beneath decorative metal grilles that extend out from the exterior wall and are supported by metal posts. Fixed, floor-to-ceiling multi-pane windows are located next to the front entrance and are partially obscured by the metal grilles. There is a second entrance recessed into the brick wall with a metal door accessed by a set of concrete steps. The southwest corner of the building contains two fixed multi-pane windows on the first story and two louvered windows on the second story set flush into vertical bands of textured stucco.</p>	<p>1982 (Blurock): Interior reconfigurations, mechanical system upgrades, elevator added.</p> <p>2000 (Hill): Seismic upgrades.</p>




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1000 Fine Arts/Art Gallery</b> 	1959	<p>The two-story Mid-Century Modern building is irregular in plan with a flat roof and is clad in stucco. One-story partial-length projections clad in running-bond brick occur on the main (south), east, and north elevations. Fenestration is regular on the main elevation and features paired metal-framed windows, separated by structural mullions, with four horizontal lites; the second lite operates as an awning window, and the fourth lite operates as a hopper window. Other windows on the building are metal-framed with one or two lites. A replacement window punctuates the brick projection on the main elevation. The main entry is recessed with a newer wide metal and glass entry door and a narrow sidelite to the left (west), surrounded by wider sidelites and topped by a fixed, three-lite transom window. Access is provided by a handicap ramp leading to a poured concrete stoop.</p>	<p>1976 (Blurock): Interior reconfigurations, addition of external elevator and construction of brick walls and patio area to east elevation area.</p> <p>1981: Wheelchair ramp added.</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2002 (McMurray): Seismic work, new interior finishes, mechanical system upgrades, new handicap ramp, interior reconfigurations, finish replacements, fireproofing.</p> <p>2009 (Runge): Reroofed.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1100 Music</b> 	1967	<p>This New Formalism-style building is clad in stucco and is irregular in plan with block-like massing and a flat roof. The main elevation faces south towards East Chapman Avenue, and presents as two sections: the western section with slender, attenuated columns supporting minimalist arches, four of which are infilled with smooth, monolithic stucco panels and the fifth, just west of center, is open and leads to the recessed main entrance; and the eastern section, which is recessed and contains with smooth, monolithic concrete panels sparsely punctuated by pairs of small metal-framed windows and displaying large ornamental screen grilles. The remaining elevations contain portions of running-bond brickwork at the ground floor while the rest is clad in smooth, monolithic stucco. Fenestration on the remaining elevations consists of metal-framed windows of various sizes, some fixed and others operable, as well as secondary entrances. An external staircase on the east elevation references the external staircases observed on the original campus buildings.</p>	<p>2003 (Swanye): Fire alarm system upgrade.</p> <p>2008 (Asuncion): Chilled water distribution modifications.</p> <p>Date unknown: Second-floor-level walkway from the Administration Building connecting to the east elevation, and a free-standing external elevator attached to the east elevation south of the walkway.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**


Current Building Number and Name	Built	Description	Identified Alterations
<b>1200 Physical Education</b> 	1955	<p>The Mid-Century Modern two-story building presents with block-like massing, thanks in part to building additions during Taylor's tenure as campus architect. The main body of the building is clad in stucco, with one-story projections constructed of brick in a running bond pattern and wrapped with a flush band of stucco near or at the roofline. The building is irregular in plan and features multiple levels of flat roofs. The fenestration for the building is irregular. Metal-framed multi-lite clerestory windows adorn the main body of the building, while the one-story projections contain a variety of metal-framed windows of different styles and arrangements. Of note is the placement of multi-lite windows in the top half to one-third of exterior walls on some of the one-story projections, subtly referencing the clerestory windows of the main section.</p>	<p>1956 (Taylor): One-story brick addition for health center.</p> <p>1957 (Taylor): Additions to men's and women's locker rooms.</p> <p>1962 (Taylor): Addition to south and northwest sections of the buildings, interior reconfiguration, construction of flat-roof covered walkway and butterfly-style covered walkway.</p> <p>1979 (Blurock): Interior reconfigurations, HVAC upgrades, plumbing upgrades, updates to finishes.</p> <p>1982: Reroofed.</p> <p>1999: Interior reconfiguration, mechanical systems upgrades, site work, removal of skylights, and fixture replacement.</p> <p>2000 (Hill): Seismic upgrades.</p> <p>2001 (Smith/tBP): Women's Locker Room HVAC work, interior renovations and demolitions, new exterior doors.</p> <p>2003 (Swanye): Fire alarm system upgrade.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
			<p>2008 (Amicay): Fire alarm system upgrades.</p> <p>2008 (Lambert): Construction of swimming pool, single-story 24-foot by 72-foot equipment building and handicap-accessible restroom upgrades.</p>
<p><b>1300 Theatre Arts</b></p> 	1967	<p>The two-story Mid-Century Modern building is irregular in plan with block-like massing. The main elevation faces east towards the center of campus. The majority of the building is clad in smooth, monolithic stucco, with sections of running-bond brickwork at the ground floor. Fenestration is minimal and irregular, typically consisting of metal-framed windows with a large fixed lite over a horizontal hopper-window lite. Exterior staircases are located on the south and main elevations..</p>	<p>2003 (Swanye): Fire alarm system upgrade.</p> <p>2008: Upgrades to fire system.</p> <p>Date Unknown: Addition of a free-standing external elevator to the south elevation.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Chapman and Wilshire School Acquisition and Annexation (Kirby, 1980–1984)</i>			
<b>2100 Wilshire Theatre</b> 	1936	<p>This two-story PWA/WPA Moderne-style school auditorium is a modest example of the style. The building is largely rectangular in plan, is clad in stucco, and has a flat roof. The main (west) elevation features a centered trio of recessed three-panel wood double-doors, each topped by 12-lite transom windows. The doorways are flanked by fluted pilasters, with a recessed three-by-three wood-framed casement window to either side of the door grouping. The casement window to the right (south) serves as the ticket window. Additional secondary entrances, along with recessed three-by-three wood-framed casement windows located near the second-floor level, exist on the north and south elevations.</p>	<p>1982 (Blurock): New interior and exterior finishes, window replacements and additions, interior reconfigurations, updates to electrical plan and fixtures.</p> <p>2008: Interior renovations, upgraded finishes, electrical upgrades.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p> <p>2009 (Runge): Reroofed.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>W1 Building 100</b></p> 	1936	<p>This one-story PWA/WPA Moderne-style school classroom building is a modest example of the style. The rectangular building is clad in stucco and features a raised parapet surrounding a flat roof. The main (south) elevation features a centered, recessed wood double-door, with each leaf having six lites over two panels. There appears to be an infilled transom window above the doors. The entrance is flanked by fluted pilasters, with a pair of 12-lite windows, separated by a structural mullion, to either side. Two decorative stucco bands and two subtle stepped roofline bands ring the building. Fenestration on the other elevations is regular, and consists of either a single pair or a group of two 12-lite windows separated by structural mullions with fluted pilasters to either side of the groupings; some windows appear to be filled in. Porte cochères located on the west and north elevations connect to the Wilshire Theatre and Building 200 .</p>	<p>1970: Installation of AC system.</p> <p>1982 (Blurock): Replacement of windows, repair and repaint of interior and exterior finishes, installation of new aluminum sunscreen to east elevation, HVAC system upgrades.</p> <p>2007 (Runge): Window replacements, mechanical system upgrades, interior reconfiguration, repainting, site work.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>W2      Building 200</b></p> 	1936	<p>Similar to W1 Building 100, this one-story PWA/WPA Moderne-style school classroom building is a modest example of the style. The rectangular building is clad in stucco and features a raised parapet surrounding a flat roof. The main (east) elevation features a centered, recessed wood double-door, with each leaf having six lites over two panels, and topped by a 12-lite transom window. The entrance is flanked by fluted pilasters, with a pair of 8-lite windows, separated by a structural mullion, to either side; the windows appear shorter than the typical 12-lite windows and the door appears raised to the level of the newer concrete entry stoop (likely to improve ADA access). Two decorative stucco bands and two subtle stepped roofline bands ring the building. Fenestration on the other elevations is regular, and consists of a group of three 12-lite windows separated by structural mullions with fluted pilasters to either side of the groupings.</p>	<p>1982 (Blurock): Replacement of windows, repair and repaint of interior and exterior finishes, installation of new aluminum sunscreens on east west elevations, HVAC system upgrades.</p> <p>2007 (Runge): Window replacements, mechanical system upgrades, interior reconfiguration, repainting, changes to handicap ramp, site work, and parking lot work.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR




**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Chapman Avenue Residential Acquisitions 1980s and 1990s</i>			
<b>428 East Chapman Avenue Buildings 1 and 2 (400 N. Newell Place)</b> 	Building 1:c. 1920 Building 2:c. 1940	<p>APN 033-072-01 consists of a single-family residence (Building 1) and a multi-family residence (Building 2) that are currently owned and used by FCC. Building 1 is a one-story single-family residence with an irregular plan set on a concrete foundation, and has a hipped roof clad with composite shingles. The house was constructed in the Craftsman style around 1920.</p> <p>The multi-family residence on the property that we will refer to as Building 2 is a duplex designed in the Minimal Traditional style and is oriented toward Newell Street.</p>	None identified.
<b>434 East Chapman Avenue</b> 	1922	<p>APN 033-072-02 features a single-family residence constructed in the Craftsman style in 1922. The one-story, front-gabled home has a composite shingle roof and is clad with horizontal wood siding and set on a poured concrete foundation. The building is rectangular in plan, with a prominent front porch oriented to Chapman Avenue. The parcel also contains a small, one-story garage building.</p>	None identified.




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>438 East Chapman Avenue</b> 	1921	APN 033-072-03 features a one-story single-family residence that is oriented toward Chapman Avenue that was originally constructed in 1921 in the Craftsman style and was remodeled in 1949 to its present Minimal Traditional appearance. The residence is irregular in plan, set on a poured concrete foundation, with a complex roof clad in composite shingles, and is clad in horizontal wooden siding.	Remodeled to Minimal Traditional style in 1949.
<b>325–327 North Newell Place</b> 	c. 1921–1924	The one-story Bungalow style duplex is clad in horizontal wood siding, features a gabled roof, and is square in plan. The façade of the building features mirrored entry points with wooden doors and three-section, fixed Craftsman style windows, all under a gabled porch with brick-and-wood columns. The other elevations have irregular fenestration and feature a variety of sizes, but maintain a one-over-one configuration.	None identified.
<b>409 North Newell Place</b> 	c. 1958–1960	This modern two-story multi-family apartment building is rectangular in plan and clad in stucco, with a low pitched roof with exposed rafter tails. The first floor features three bays with double-wide sectional garage doors, and the second floor features a wooden balcony providing access to three living spaces. Entry to the building is provided by an exterior staircase located on the north elevation. There are a variety of windows throughout, including jalousie windows on the north and west elevations. The west elevation also features a single entry door centered on the elevation that provides access to the first story of the building.	None identified.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR



**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>420 East Chapman Avenue</b> 	c. 1920	The one-story gabled Bungalow features an offset to the east front gabled porch supported by brick-and-wood columns, which features a Craftsman style fixed three-section window and an entry door. The house is clad in horizontal wood siding and sheathed in composition shingles, and the roof features exposed rafter tails. The remaining windows are single-hung, fixed wood windows in a variety of sizes.	None identified.
<b>416 East Chapman Avenue</b> 	c. 1936	The one-story gabled Minimal Traditional duplex is clad in stucco, is rectangular in plan, and is sheathed in composition shingles. The façade of the building features an offset to the east gabled entry point that provides two entry points to the duplex. There is also a bay window and a 12-paned wood window on the façade of the building.	None identified.
<b>418 East Chapman Avenue</b> 	c. 1958	The one-story tract house duplex is clad in stucco features a low pitched roof sheathed in composition shingles and is set on a poured concrete foundation. The building features irregular fenestration with a central entry point. Windows appear to be vinyl replacement windows in varying sizes and arrangements. The building is largely obscured from view by a tall wooden fence.	Date Unknown: Replacement windows, screen door, and construction of fence.






# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>William E. Blurock's Campus Expansion Plan (1965–1984)</i>			
<b>2200 Micro Computer Lab</b> 	1973	The one-story relocatable modern building with a low pitched roof sits on a poured concrete foundation and features two entry points on the east elevation under a cantilevered canopy. The building is rectangular in plan. The entry is accessed by concrete ramp with metal handrails. Fenestration is irregular and there is little exterior ornamentation.	None identified.
<b>2300 Media Services/Academic Computer/M&amp;O Shops</b> 	c. 1970	The one-story relocatable modern building is rectangular in plan, is clad in stucco, and features a low pitched shed roof. The building has paved parking areas on the north, east, and south elevations. The main points of entry for the building are located on the north elevation. There are multiple points of entry with two sets of double metal doors and five sets of single metal doors with sidelights. The north elevation also features two sets of fixed metal windows offset to the west.	None identified.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1800 Child Development Building</b> 	c. 1980	The one-story Modern style classroom building complex consists of three one-story buildings that were connected and arranged in an L shape around an open courtyard to the south. The two buildings, which feature low pitched roofs, were known as relocatable buildings to the campus and the clay-roof-tiled building that creates the "L" in the plan was newly constructed after the two relocatable buildings were moved to the location. The buildings are clad in stucco, with some sections of vertical wooden siding, and feature a complex roofline with clay tiles. Fenestration is irregular and includes metal-frame windows in varying sizes on all elevations. There is also a chain-link fence on the south elevation that provided security for the courtyard area, which was a play area for children.	None identified.
<b>2000 Student Services Building</b> 	1984	The two-story Modern style building is clad in stucco with a flat roof. It is irregular in plan and features irregular fenestration with fixed metal windows of varying sizes. The main point of entry for the building is located on the east elevation. The building connects to a pedestrian bridge that connects it to the rest of the campus on the north side of Chapman Avenue.	2008: Reroofed.
<b>Pedestrian Bridge</b> 	1984	The pedestrian bridge provides north-south access across Chapman Avenue. It is of Modern style construction and is supported by arched concrete supports on the north and south ends. The bridge is connected to the Student Services building to the south and the Administration building to the north.	None identified.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
Building 3100, Academic Technology 	1976	The one-story Modern building is irregular in plan and sits on a poured concrete foundation. The building features a built-up flat roof and was designed by Blurock.	2008: Interior renovations, upgrades to telecommunications and electrical systems.

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# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## 5 SIGNIFICANCE EVALUATIONS

Extensive archival research, combined with an intensive pedestrian survey of the Fullerton College grounds, indicates the campus has three potential historic districts (Figure 31): the Fullerton Junior College Campus Historic District, the Mid-Century Modern Campus Expansion Historic District, and the Wilshire Junior High School Historic District. Furthermore, the Music Building 1100 was identified as being potentially eligible for individual listing at the local level. The significance evaluations for each of the proposed historic districts and the individual property are detailed below.

### 5.1 Fullerton Junior College Campus Historic District

After purchase of the college grounds in 1934, Vaughn laid out a master plan for the new 16-acre FJC Campus. Assisted by landscape architect Ralph Cornell, Vaughn created a plan that called for 12 buildings symmetrically organized around a formal central courtyard area, similar to the arrangement of Jefferson's University of Virginia. Vaughn designed the buildings in the Spanish Colonial Revival style with Churrigueresque style influences, an architectural style synonymous with Southern California. The FJC received a great deal of WPA and PWA funding for executing the campus plan. The WPA also provided Vaughn and FJC with funding for the construction of a greenhouse and for landscaping. With this funding, the Horticulture students of FJC were able to grow plants to place throughout the campus accenting Vaughn's plan. Although the master plan originally called for 12 buildings, only 5 were constructed: the Commerce building, Administration building, Technical Trades building, Student Union building, and Greenhouse Building (FHN 2010; Epting 2014). Each of those 5 buildings still exists and continues to serve a vital role on campus. Furthermore, the City of Fullerton identifies the FJC Campus as a "Significant Property" in their publication *Fullerton Through the Years: A Survey of Architectural, Cultural, and Environmental Heritage* (DSD 2002) and in Section 5.10, Cultural Resources, of *The Fullerton Plan: Final Program EIR* (City of Fullerton 2012b).

The boundary of this potential historic district includes the historic core of the FJC Campus, and consists of the original five buildings and remnants of the formal campus plan, such as the open courtyard, linear pathways, and building locations and orientations. There are also non-contributing elements (i.e., they do not contribute to the historic district's significance) within the historic boundaries of the campus, namely more modern buildings, but they were constructed on areas of ground originally apportioned for buildings in Vaughn's master plan. Table 4 provides a complete list of all potential contributing and non-contributing components. Figure 32 shows the location of all contributing buildings. The period of significance for the district is 1935–1942, when Vaughn completed the original campus master plan.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 4**  
**Inventory of Buildings within the Potential**  
**Fullerton Junior College Campus Historic District**

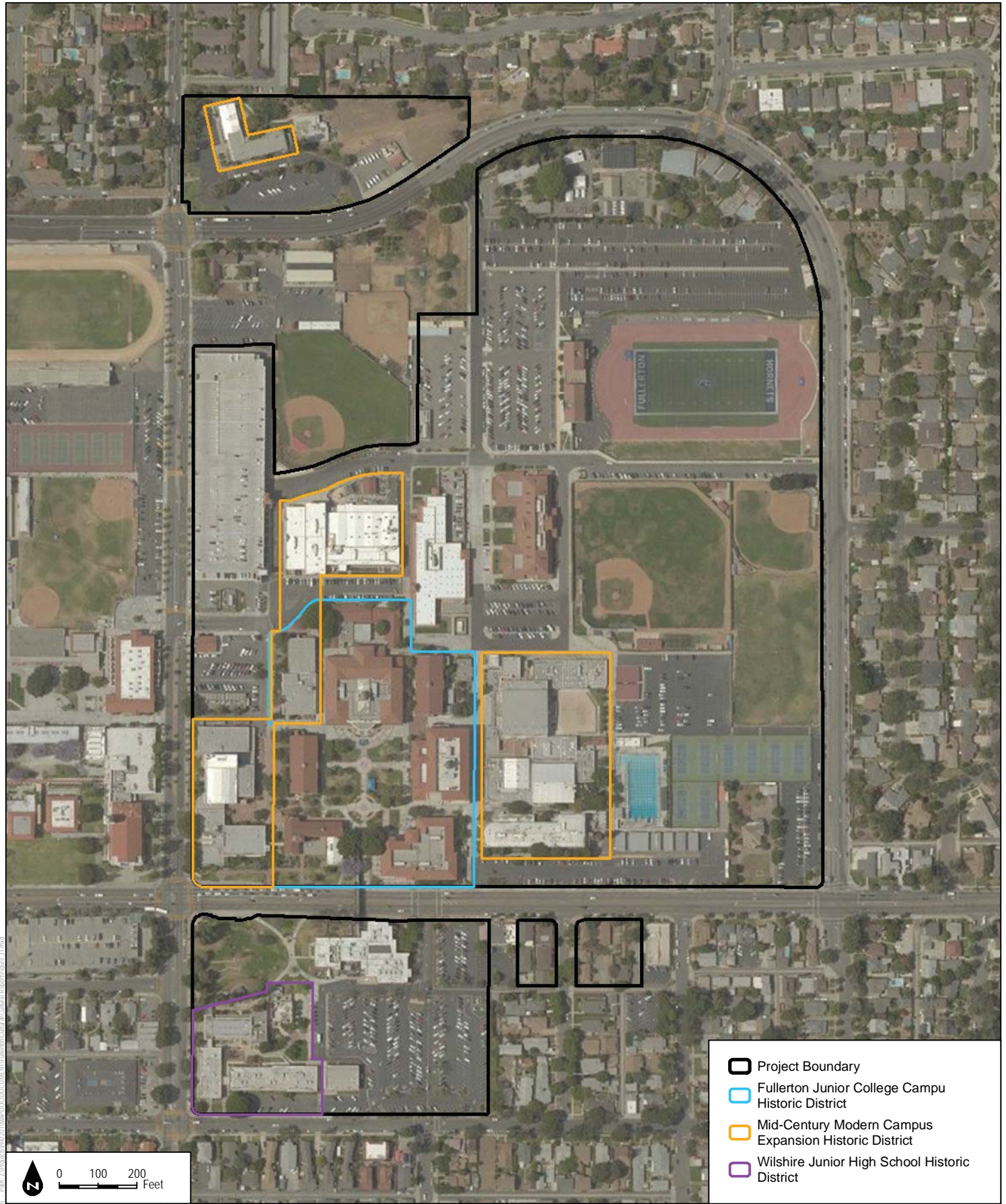
Component	Year Built	Historic District Status
Landscape Design Components	c. 1935–1942	Contributor
Commerce (Bldg. 300)	1936	Contributor
Greenhouse (Bldg. 401)	c. 1937	Contributor
Technical Trades (Bldg. 600)	1938	Contributor
Administration and Social Sciences (Bldg. 100)	1938	Contributor
Student Union (Bldg. 840)	1940	Contributor
College Center (Bldg. 200)	1969	Non-contributor
South Science (Bldg. 400)	1969	Non-contributor
Applied Arts/Humanities (Bldg. 500)	1969	Non-contributor
Library (Bldg. 800)	1969–1976	Non-contributor

## Character Defining Features

The character-defining features of the Fullerton Junior College Campus Historic District include the following exterior features:

- Low pitched side-gabled roofs with half-barrel clay Mission tiles
- Painted, board-formed concrete walls
- Simple rectangular or L-shaped plans
- Exterior stairways on gable ends
- Symmetrical fenestration
- Prominent arches above entryways
- Heavy, multiple-panel wood doors
- Low relief oriels with typically semi-circular balconies below slightly recessed windows
- Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes
- Elaborate ground-floor entrances with recessed doorways, surmounted by decorative plaques
- Extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings





**FIGURE 31**  
**Overview of Historic Districts on Campus**

SOURCE: Bing Maps, 2017



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The character-defining features of the Fullerton Junior College Campus Historic District also include the following interior features (as observed in the 100, 300, and 600 buildings):

- Recessed doorways
- Wood doors with stacked panels
- Decorative iron work (including stair railings; light fixtures in buildings 100 and 300)
- Barrel vault ceilings
- Brass door hardware

### **5.1.1 NRHP/CRHR Evaluation Criteria**

The buildings and campus components within the proposed Fullerton Junior College Campus Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met for a property to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

***Criterion A/I: Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.***

FJC was established in 1913 and opened in September of that year, making it the longest continually operating junior college in California. The founding and growth of FJC occurred at the same time as the City of Fullerton and the surrounding area experienced rapid growth due to the oil boom, which peaked during the 1920s. Classes were originally held at Fullerton Union High School, until 16 acres of land were bought across the road from the high school in 1934. The Board of Trustees hired Vaughn to design and oversee planning and development of the FJC Campus from 1935 to 1942. Vaughn operated as the FJC Campus architect with the assistance of WPA funds, designing and supervising construction of numerous buildings on the campus until 1942.

With 4-year university enrollments on the decline due to financial instability, FJC provided an affordable option for the students of Fullerton and the surrounding communities, eventually reaching an enrollment of 1,500 by September 1939. A rapid decline in enrollment followed, as many potential students were drafted or volunteered for the military. FJC persevered through the war, implementing new programs to support the war effort by training workers for defense industry jobs. Other activities on campus further supported the war effort, such as letter writing



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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and making clothing for the troops. FJC continued serving the military after the war effort by adding temporary buildings and veterans' housing to accommodate the massive influx of WWII veterans using the G. I. Bill.

FJC has a rich history of assisting with the war effort by providing training and education, both during WWII and after the war, as veterans returned to civilian life. Furthermore, the original FJC Campus forms the core of California's longest continuously operating junior college. Therefore, the Fullerton Junior College Campus Historic District appears eligible for listing as a historic district under NRHP/CRHR Criterion A/1.

**Criterion B/2:**        *Is associated with the lives of persons important in our past.*

Although numerous persons are historically associated with FJC, archival and background research failed to indicate any associations with persons important in history during 1934–1942. Therefore, the Fullerton Junior College Campus Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

**Criterion C/3:**        *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

The buildings constructed as part of the original FJC Campus design plan embody the distinctive design characteristics of Spanish Colonial Revival, a modern architectural style that dates from 1915 to 1940 and became synonymous with Southern California architecture. During this period, Spanish Colonial Revival was a popular style of architecture on college campuses in California, particularly in the south.

The campus buildings from the 1930s and 1940s are most strongly characterized by their simple rectangular and L-shaped plans; symmetrical fenestration; barrel-shaped Mission tiles cladding low-sloped, side-gabled roofs; prominent arches above entrance doors; exterior stairways on the gable ends; and use of concrete as the dominant material type. The buildings are unified aesthetically by a number of character-defining features, including painted, board-formed concrete walls; heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings.

The FJC campus was designed by an important creative individual, Harry K. Vaughn, and represents the peak of Vaughn's career (1930s–1940s) when he completed his most important—possibly his

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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only—designs as an independent architect, including the Spanish Colonial Revival style Fullerton Public Library. Prior to that time, Vaughn worked under such notable architects as Irving Gill, William Hebbard, Carleton Winslow, and Octavius Morgan, and afterward he went on to work for the California Department of Public Works, Division of Architecture. During Vaughn’s time with Hebbard, he prepared working drawings for the historic Craftsman style Marston House in San Diego. Afterwards, while working for Winslow, Vaughn prepared the working drawings for buildings associated with the 1915–1916 Panama–California International Exposition, including the Administration building. The Exposition buildings (now Balboa Park National Historic Landmark) were seminal in making the Spanish Colonial Revival style synonymous with Southern California; this was Vaughn’s first known exposure to the Spanish Colonial Revival architectural style.

Although the 1930s and 1940s buildings are unified by their Spanish Colonial Revival style and shared character-defining features, and they remain functionally related buildings, the original landscape design of the campus master plan has been altered over time (as seen in historic aerials c. 1953–1963, c. 2004, and after 2012 (NETR Online 2017)). The front of campus, facing onto East Chapman Avenue, was originally a broad expanse of flat lawn with ornamental, curvilinear plantings near the Administrative building and the anticipated footprint of another L-shaped building in the southeastern corner; a wide, north–south oriented pathway separated the two buildings and formed the grand entrance into the heart of the original campus. Between 1953 and 1963, modern additions to the two buildings infilled approximately half of the open lawn, eliminating the curvilinear planting beds, and several ancillary paved pathways further segmented the lawns. A distinctive and prominent feature of the original campus was the arrangement of the central courtyard into *parterres* (i.e., flat gardens arranged in a formal design), delineated by a grid of walkways. The grid of north–south and east–west oriented walkways served a functional use, facilitating movement within and around campus. The symmetry of the strict spatial organization created by the grid, and positioning of the library at the northern end, opposite the main entrance to campus, symbolized the power and success imparted by knowledge and learning. The expansion of the library in 2004 resulted in foreshortening the length of the original courtyard space and introduced a curved element in the shape of the hardscaping fronting the library. Additionally, at some point after 2012, the original pattern of the courtyard *parterres* was altered by removing the existing two north–south pathways and replacing them with one central north–south pathway leading directly from the main campus entrance to the library’s door, and by introducing more circular hardscaped areas at the site of formerly orthogonal intersections.

Other compromised historic materials and details include the building interiors, particularly on the second floor, with the interior of the Campus Services Building 840 being fully compromised; the expansion of two newer buildings slightly beyond the bounds of the original

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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campus footprint; and a 1957 Modern style addition to the front of the Administration Building 100. However, the essential physical features that constitute the Fullerton Junior College Campus Historic District's Spanish Colonial Revival architectural style remain largely intact. Although new buildings were added to the campus, and removal of portions of the landscape design altered the flow of the original FJC Campus design, the historic-age buildings are still united aesthetically by their Spanish Colonial Revival style and functionally by their history as the original 1930s–1940s FJC Campus buildings.

Despite alterations to the original FJC Campus design plan and the addition of new buildings in recent years, the original 1930s and 1940s Spanish Colonial Revival buildings and the master plan landscape design still convey most of the major character-defining features of their style and design, and represent the notable work of a master architect. Therefore, the buildings appear eligible for listing as contributors to a historic district under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, Fullerton Junior College Campus Historic District does not appear eligible for listing under Criterion D/4.

### **5.1.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Fullerton Junior College Campus Historic District appears eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** The Fullerton Junior College Campus Historic District appears eligible for listing for being the original buildings and campus master plan of FJC. The original FJC Campus forms the core of California's longest continuously operating junior college.
5. ***Exemplification of the best remaining architectural types in an area.*** The historic district represents a group of exceptional examples of Spanish Colonial Revival architecture and the landscape design of the original campus master plan.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** The buildings in the historic district are rare examples of Harry K. Vaughn's work as a solo architect, who had an esteemed career working for such esteemed California architects as Irving Gill, William Hebbard, Carleton Winslow, and Octavius Morgan. It was his time working on the



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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1915–1916 Panama–California Exposition buildings with Winslow that inspired Vaughn’s designs for the Fullerton Junior College campus.

7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The historic district appears eligible for listing for the outstanding attention to detail evident in the buildings’ heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The historic district’s buildings and campus master plan present a group of buildings designed in the Spanish Colonial Revival style, of which the preservation of each of the five buildings and landscape design components are necessary to maintain their integrity and recognition as a historic district.

### 5.1.3 Integrity Considerations

Integrity is the authenticity of a historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.1.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

**Location:** The Fullerton Junior College Campus permanent buildings have always occupied the same location. While various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the Fullerton Junior College Campus Historic District retains integrity of location.

**Design:** For historic districts, design includes more than the integrity of the individual buildings. It also includes the way in which buildings within the district are related and connected. Overall, contributing buildings within the historic district retain a preponderance of the major design elements and character-defining features of Spanish Colonial Revival architecture that aesthetically unify them on the exterior, including their simple rectangular and L-shaped plans; symmetrical fenestration; barrel-shaped Mission tiles cladding low-

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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sloped side-gabled roofs; prominent arches above entrance doors; exterior stairways on the gable ends; and use of concrete as the dominant material type. Major exterior alterations to the buildings include an addition to the west wing of the Campus Services Building 840, and replacement of some original iron guardrails.

Additionally, the majority of the building interiors were substantially altered as part of remodeling efforts, which in many cases included removal of character-defining features on the interior. The design aesthetics of Spanish Colonial Revival architecture extended into interior spaces. The ornate iron fixtures such as handrails and lighting components, heavy wood doors, and decorative flourishes are still evident in many of the buildings. However, the reconfiguration of interior spaces on any campus is a common occurrence in response to changes in enrollment capacity, education pedagogy, and building functionality.

Integrity of the original campus plan has been somewhat compromised by foreshortening the original courtyard space; removing the existing two north–south pathways and replacing them with one central north–south pathway; and introducing several circular hardscape features among the originally orthogonal intersections and pathways. The campus does, however, still retain the essence of its original plan as a symmetrical arrangement of buildings organized around a formalized central courtyard.

In consideration of integrity of design, the Fullerton Junior College Campus buildings appear to retain the requisite integrity of the Spanish Colonial Revival stylistic elements that unify them, and Fullerton College retains the integrity of the basic layout of the original campus plan. However, aspects of design integrity related to the original campus landscape design have been partially lost.

**Setting:** The area surrounding FJC has noticeably changed since the 1930s. Originally set in an area of Fullerton bordering agricultural land, the surrounding residential and commercial development expanded along with the campus during the district’s period of significance. Later additions to campus were built around the periphery of the original FJC master plan campus. One notable change to the campus setting in recent years is alterations to pathways of the original landscape design. Additionally, trees and greenspace once located at the front (southern end) of campus were largely replaced with the College Center Building 200, the Modern extension to the main (south) elevation of the Administration Building 100, and a pedestrian bridge across East Chapman Avenue. Although most portions of the campus retain their setting, others (e.g., the area fronting onto East Chapman Avenue) have been altered. Therefore, the Fullerton Junior College Campus Historic District retains partial integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, including painted, board-formed concrete walls; heavy, multiple-panel

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings. Although sections of the original landscape design were altered or removed, the remaining sections and repetitive nature of the materials historically used on campus still conveys the materials and intent of the original campus. Therefore, the Fullerton Junior College Campus Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the board-formed concrete that shapes the buildings, the purposeful use of similar yet noticeably different design flourishes, and in the striking Spanish Colonial Revival characteristics of the buildings and the sculptural qualities that they exude. Overall, the Fullerton Junior College Campus Historic District retains integrity of workmanship.

**Feeling:** The Fullerton Junior College Campus Historic District buildings and other contributing elements strongly express the Spanish Colonial Revival aesthetic. The buildings' simple rectangular and L-shaped plans and symmetrical fenestration, combined with the aesthetically unifying painted, board-formed concrete walls; heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings, immerses one in the Spanish Colonial Revival style. The Fullerton College Campus continues to evoke the spirit of Spanish Colonial Revival through its original 1930s and 1940s buildings, and therefore retains integrity of feeling.

**Association:** The Fullerton Junior College Campus Historic District is not associated with any important historic events or people.

### 5.1.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicates that the original 1930s–1940s FJC Campus appears to be eligible as a historic district under NRHP Criterion A/CRHR Criterion 1 and NRHP Criterion C/CRHR Criterion 3, as well as local criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district's period of significance (1935–1942).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

As a result of these findings, the Fullerton Junior College Campus Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6, Impacts Analysis.

### 5.2 Mid-Century Modern Campus Expansion Historic District

The buildings constructed during the late 1950s through the 1960s represent a significant community of buildings united aesthetically by their Modern architectural style. These buildings were developed as part of the mid-century expansion master plan for the campus, which was designed and executed by architect William Henry Taylor, of Taylor, Warren, Nishimoto and Conner. The Mid-Century Modern Campus Expansion Historic District period of significance is 1955–1967. This period begins with the early phases of campus expansion when FJC hired Taylor as their campus architect, and ends while the last buildings designed by Taylor were under construction and the role of campus architect transitioned to William E. Blurock.

The boundary of this potential historic district is discontinuous, forming three distinct clusters around the core of the original campus: the Music, Theatre Arts, and Applied Arts/Humanities buildings west of the core campus; the North Gym and Fine Arts/Art Gallery buildings east of the core campus; and the Berkeley Center at the northern bounds of campus. All pre-1955 and post-1967 buildings on campus are non-contributors. Table 5 provides a complete list of all potential contributing elements within the historic district. Figure 33 shows the location of all contributing buildings.

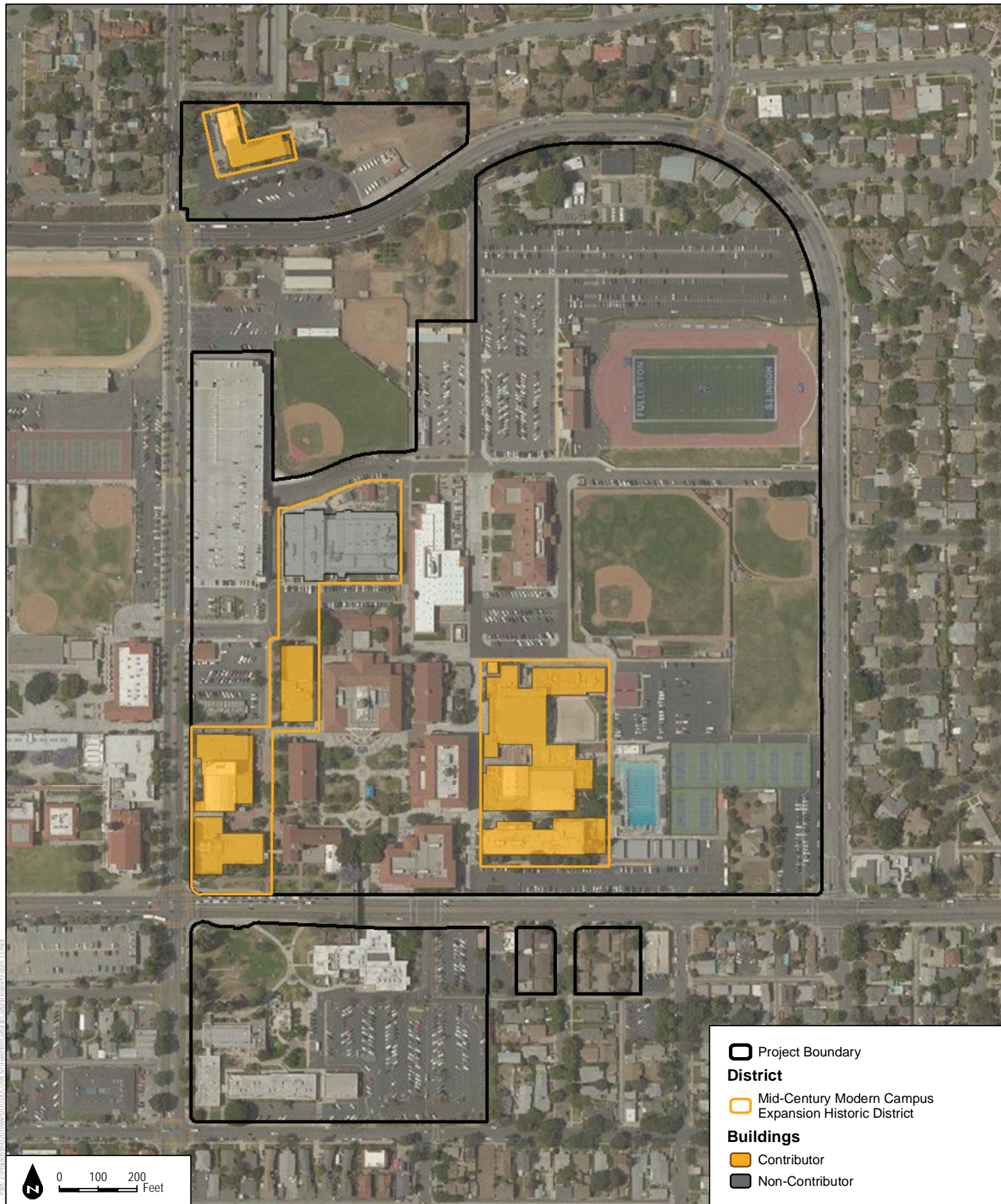
**Table 5**  
**Inventory of Buildings within the Potential**  
**Mid-Century Modern Campus Expansion Historic District**

Building Name and No.	Year Built	Historic District Status
<i>Science Building (N/A)</i>	1954	<i>Demolished in 2010</i>
Gymnasium Complex (1200)	1955–1962	Contributor
Art–Home Economics (1000)	1957	Contributor
<i>Library (N/A)</i>	1957	<i>Demolished in 2003</i>
Technical Education (700)	1959	Non-contributing; altered beyond recognition after 2007
District Administration Building (3000)	1960	Contributor
Applied Arts/Humanities (500)	1962	Contributor
Music (1100)	1967	Contributor
Theatre Arts (1300)	1967	Contributor

**Notes:** N/A = not applicable.

The Gymnasium Complex comprises three phases of construction: main building completed in 1955, followed by additions in c. 1957 and c. 1962. All phases were designed by William Henry Taylor.





SOURCE: Bing Maps, 2017

**FIGURE 33**  
Mid-Century Modern Campus Expansion Historic District

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## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Character Defining Features

The character-defining features of the Mid-Century Modern Campus Expansion Historic District include the following:

- Flat roofs without copings
- Broad, typically smooth, expanses of light-colored concrete walls
- Flush-mounted metal-framed windows arranged in linear groupings
- Cantilevered canopies and overhangs
- Exterior staircases, patios, and balconies
- A marked absence of decorative detailing around windows and doors
- Asymmetrical block-like building massing
- *Brise soleils* (particularly the Music Building 1100)
- Slender, attenuated columns supporting minimalist arches (Music Building 1100)
- Covered walkways with butterfly canopies (Gymnasium Complex)
- Brick privacy screens (Gymnasium Complex)
- Repetition of butterfly form in landscape bench seating

Of the nine buildings designed by Taylor, six remain largely unaltered, one has been altered beyond recognition, and two have been demolished to make room for newer buildings.

### 5.2.1 NRHP/CRHR Evaluation Criteria

The buildings and campus components within the proposed Mid-Century Modern Campus Expansion Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

**Criterion A/I:** *Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.*

As FJC was already well established, it does not appear that construction of the Mid-Century Modern buildings resulted in any significant contribution to patterns of development in the



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Fullerton area. Further, no other events were identified as a result of archival and background research that would warrant consideration under this criteria. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Although numerous persons are historically associated with FJC during the Mid-Century Modern Campus Expansion period of significance, archival and background research failed to indicate any associations with persons important in history. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

The majority of buildings constructed as part of the Mid-Century Modern Campus Expansion embody the distinctive characteristics of the International style, an architectural style popular in the United States between the 1950s and 1970s in the United States, while one was designed in the New Formalism style, which is characterized by the adaptation of classical elements into an International style expression. The buildings were designed by the late William Henry Taylor (1912–1995), an important architect in the San Gabriel Valley for his interpretation of modernism (see Section 3.5.4). In 1953, FJC started its second expansion phase, which continued into the 1960s. The Pasadena architectural firm of Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) was selected by the FJC trustees to develop a new master plan for the campus, with Taylor serving as the buildings' principal designer.

The Gymnasium Complex (Building 1200), Art–Home Economics building (Building 1000), District Administration building (Building 3000), Applied Arts/Humanities building (Building 500), and Theatre Arts building (Building 1300) were designed in the International style. Somewhat modest interpretations of that style, the buildings are characterized by flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. The shared design characteristics unify the discrete groupings of these modern buildings, making them instantly recognizable as a discontinuous but integrated whole.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The Music Building 1100 is a significant element of Taylor's modern campus design, exhibiting New Formalist design principles and anchoring the southwest corner of the campus. The 1962 Lincoln Center for the Performing Arts (New York) is one of the best-known examples of New Formalism in the United States, which is an adaptation of International style created to evoke a more symbolic, ceremonial feeling by translating classical elements into a modern aesthetic. Taylor emulated that design ethos in his design for the Music building by intentionally incorporating the defining characteristics of New Formalism: slender, attenuated columns supporting minimalist arches; smooth, monolithic concrete panels; ornamental screen grilles; and a flat slab roof, with the overall building massing presenting as block-like forms (McAlester 2015). The Music Building also represents one of the few examples of New Formalism in Fullerton. The only other known examples of the style in the city include Fullerton City Hall (1963) and the Western State University College of Law (1975).

Although not widely known, Taylor appears to have quietly played an important role in the local interpretation of modernism in Southern California during a time when architects like Neutra and Harris were making a name for themselves as among the most important modern architects in the country. Much of Taylor's mid-century modern work occurred in Pasadena and San Gabriel Valley, from which some of the most influential modern architects emerged. Taylor's modern designs at Fullerton College embody characteristics of the International style: flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. The buildings largely retain exterior physical integrity, with the exception of some minor alterations to the landscape and hardscape, including removal of the pool behind the gymnasium; the area now serves as a sand volleyball court. The Gymnasium Complex also had the skylights above the main and women's gymnasiums removed, with the resulting gaps roofed over and covered with rolled roofing material. The most notable exception to integrity is the Technical Education Building 700, a non-contributor to the district, which was altered beyond recognition after 2007. Regardless, the remaining Modern buildings retain their characteristics of International and New Formalist architectural styles and exemplify educational architecture during the mid-century. For these reasons, the Mid-Century Modern Campus Expansion Historic District appears eligible for listing under NRHP/CRHR Criterion C/3.

Additionally, the Music Building 1100 appears eligible for individual listing under NRHP/CRHR Criterion C/3 as an excellent local example of New Formalism, as evidenced by its slender, attenuated columns supporting minimalist arches; smooth, monolithic concrete panels; ornamental screen grilles; and a flat slab roof, with the overall building massing presenting as block-like forms.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion D/4:** *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor are they associated with any archaeological resources. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.2.2 Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Mid-Century Modern Campus Expansion Historic District appears eligible for listing under the following criteria:

5. ***Exemplification of the best remaining architectural types in an area.*** The Mid-Century Modern Campus Expansion Historic District appears eligible for listing for being a rare grouping of exemplary International style educational buildings in Fullerton; and for the Music building being one of the few extant examples of New Formalism in Fullerton.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** The historic district appears eligible for listing for being the work of William Henry Taylor, an important Southern California modern architect.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The historic district appears eligible for listing for embodying the distinctive elements of the Mid-Century Modern style, as seen in educational architecture. In particular, the Music building incorporates outstanding attention to architectural design in the attenuated columns and geometrically patterned metal, *brise soleil* while still remaining visually connected to Taylor's other International style buildings on campus.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The Mid-Century Modern Campus Expansion Historic District buildings represent a group of buildings ringing the original FJC Campus grounds and designed in the International or New Formalism style, of which the preservation of each of the six remaining buildings is necessary to maintain their integrity and recognition as a historic district.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** The historic district appears eligible for listing for the Music building, which is prominently situated on the northeast corner of

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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East Chapman Avenue and North Lemon Street and as such is strongly associated with the first view people have of the Fullerton College campus.

### 5.2.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.2.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

**Location:** The Mid-Century Modern Campus Expansion buildings have always occupied the same location. Although various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the Mid-Century Modern Campus Expansion Historic District retains integrity of location.

**Design:** For historic districts, design concerns more than the integrity of the individual buildings. It also concerns the way in which buildings within the district are related and connected. Overall, contributing buildings within the Mid-Century Modern Campus Expansion Historic District retain a preponderance of the major design elements and character-defining features of the International and New Formalism styles that aesthetically unify them on the exterior, including their flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. Exterior alterations to the buildings are minimal, and the addition of a free-standing elevator off the north end of the Applied Arts/Humanities building is consistent with the *Secretary of the Interior's Standards for Historic Preservation*. The one notable exception to this is the Technical Education Building 700, which was altered beyond recognition sometime after 2007.

In consideration of integrity of design, the Mid-Century Modern Campus Expansion Historic District buildings appear to retain requisite integrity of the International and New Formalist stylistic elements that unify them.

**Setting:** The area surrounding the Mid-Century Modern Campus Expansion Historic District buildings has not substantially changed since the late 1960s. Most of the residential and commercial development that surrounds the campus was already in place during the historic

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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district's period of significance. Therefore, the Mid-Century Modern Campus Expansion Historic District retains integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, including smooth concrete walls, metal-framed multi-paned windows, and light-toned painted surfaces. The repetitive nature of the materials historically used on campus ties the Mid-Century Modern buildings with the original campus buildings, while at the same time differentiating them based on finishing techniques. Therefore, the Mid-Century Modern Campus Expansion Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the concrete panels and columns that shape the buildings, the purposeful use of smooth and textured concrete finishes, and in the clean, linear, box-like massing of the buildings. Overall, the Mid-Century Modern Campus Expansion Historic District retains integrity of workmanship.

**Feeling:** The Mid-Century Modern Campus Expansion Historic District buildings and other contributing elements strongly express the International and New Formalism aesthetic. The graceful, elegant, unadorned forms, with the occasional artistic flourish of textured concrete or patterned metal screen grilles, evokes the zeitgeist of the modern era. The buildings form discrete pockets of modern elegance and simplicity, accentuating the more exuberant Spanish Colonial Revival buildings of the original campus; they share the feelings of excitement, innovation, and uniqueness, yet remain their own discrete parts of the campus. The Mid-Century Modern Campus Expansion Historic District exudes the spirit of modernism and therefore retains integrity of feeling.

**Association:** The Mid-Century Modern Campus Expansion Historic District is not associated with any important historic events or people.

### 5.2.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicate that the buildings designed by Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP Criterion C/CRHR Criterion 3, as well as local criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect William Henry Taylor.

Additionally, the Music Building 1100 appears eligible as both a district contributor and an individual property under NRHP Criterion C/CRHR Criterion 3, as well as local criteria 5, 6, 7,

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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8, and 9, for its high artistic value associated with the New Formalism style and its location prominently anchoring the southwest corner of campus.

As a result of these findings, the Mid-Century Modern Campus Expansion Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6.

### 5.3 Wilshire Junior High School Historic District

The 1936 buildings of the Wilshire Junior High School represent a significant grouping of buildings united aesthetically by their PWA/WPA Moderne architectural style, a style prominent in PWA/WPA buildings. Designed by architect Donald Beach Kirby, the auditorium and two classroom buildings were built of reinforced concrete; the two one-story classroom buildings and the two-story auditorium had flat roofs with low parapets. These buildings were developed to replace the original Wilshire School, which was damaged in the 1933 Long Beach Earthquake. The Wilshire Junior High School Historic District period of significance is 1936, for its association with the PWA/WPA program and being a fine example of the PWA/WPA Moderne style of buildings. Furthermore, the Wilshire Junior High School Auditorium and Classroom buildings are a listed City Landmark (Landmark number HL-12), and they are already considered historical resources under CEQA.

The boundary of this potential historic district includes the three existing campus buildings constructed in 1936, which serve as contributing elements to the district, and one c.1990 building, which is a non-contributor, built adjacent to the east elevation of the Auditorium. Table 6 provides a complete list of all potential contributing and non-contributing elements. Figure 34 shows the location of all contributing buildings.

**Table 6**  
**Inventory of Buildings within the Potential Wilshire Junior High School Historic District**

Building Name and No.	Year Built	Historic District Status
Wilshire Theatre	1936	Contributor
W1, Building 100	1936	Contributor
W2, Building 200	1936	Contributor
3D Sculpture Arts (Building 2100)	c. 1990	Non-contributing

#### Character Defining Features

The character-defining features of the Wilshire Junior High School Historic District include the following:



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Balanced and symmetrical forms based on Classical design principles
- Feeling of monumentality and authority
- Rectangular massing
- Windows arranged as vertical recessed panels
- Smooth concrete walls
- Fluted vertical ornamentation reading as modern versions of classical columns
- Subtle, unadorned, broad belt courses
- Parapets crowned with horizontal recessed bands

### **5.3.1 NRHP/CRHR Evaluation Criteria**

The buildings and campus components within the proposed Wilshire Junior High School Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

***Criterion A/1: Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.***

The Wilshire Junior High School buildings were funded by monies from the PWA/WPA during the Depression. The PWA/WPA relief program had an exceptional impact on the local economy, making possible the construction of several governmental and educational buildings during the Depression years. Other PWA/WPA buildings in Fullerton include portions of the original Fullerton Community College campus, the main public library (now Fullerton Museum Center), the city hall (now the Fullerton Police Department), the main post office, and the Fullerton Union High School. The three Wilshire Junior High School Historic District buildings appear eligible for listing under NRHP/CRHR Criterion A/1 as contributors to a historic district.





**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion B/2:** *Is associated with the lives of persons important in our past.*

Although numerous persons are historically associated with Wilshire Junior High School, archival and background research failed to indicate any associations with persons important in history. Therefore, the Wilshire Junior High School Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

**Criterion C/3:** *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

The buildings constructed for the Wilshire Junior High School embody the distinctive characteristics of PWA/WPA Moderne, a modern architectural style that dates between 1933 and 1944 in the United States. Associated with public buildings constructed as part of the relief projects sponsored by the PWA/WPA, this style of architecture draws inspiration from Beaux-Arts classicism and Art Deco exuberance, presenting them in more conservative, understated ways that lend a feeling of monumentality and authority to the buildings. Although not uncommon in public buildings of this period, examples of entire campuses specifically designed in the PWA/WPA Moderne style are less common. Elements of the style include classically balanced, symmetrical forms; windows arranged vertically as recessed panels; and expanses of smooth stucco or concrete surfaces. The Wilshire Junior High School buildings incorporate all of these defining characteristics, as well as vertically oriented fluting reminiscent of classically fluted columns. These fluting groupings are located on either side of the main entrances and window groupings, further evoking the sense of classical columns. Subtle, unadorned, broad belt courses run along the building walls at a height under window sills, while the parapets are crowned with two horizontal recessed bands.

Although the Wilshire Junior High School buildings are unified by their PWA/WPA Moderne style and shared character-defining features, and they remain functionally related buildings, the buildings have been altered in recent years. The windows and doors on the classroom buildings were replaced at some point. It also appears that some exterior doors were added on both classroom buildings to enhance access, and that a couple of window groupings facing onto Lemon Street were closed in. The auditorium appears largely intact, with a minor alteration being the addition of a newer building adjacent to the east elevation, enclosing a previously exterior-facing wall.

Despite alterations to the original campus design plan and the addition of new buildings in recent years, the original 1936 PWA/WPA Moderne buildings still convey most of the major character-defining features of their style and design, and represent the notable work of a local architect. Therefore, although not rising to a national level of significance, the buildings appear



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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eligible for listing as contributors to the Wilshire Junior High School Historic District under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor are they associated with any archaeological resources. Therefore, the Wilshire Junior High School Historic District does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### **5.3.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Wilshire Junior High School Historic District appears eligible for listing under the following criteria:

3. *Identification with a person or persons or groups who significantly contributed to the culture and development of the city.* The Wilshire Junior High School Historic District appears eligible for listing as part of the PWA/WPA projects carried out from 1933 to 1944.
5. *Exemplification of the best remaining architectural types in an area.* The historic district's buildings exemplify the PWA/WPA Moderne style, an architectural style uncommon in Fullerton despite the many projects that relied on PWA/WPA funding.
8. *Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.* The historic district's buildings represent a group of buildings designed in the PWA/WPA Moderne style, of which the preservation of each of the three buildings is necessary to maintain their integrity and recognition as a historic district.

### **5.3.3        Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.3.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Location:** The Wilshire Junior High School campus buildings have always occupied the same location. Although various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the historic district retains integrity of location.

**Design:** For historic districts, design concerns more than the integrity of the individual buildings. It also concerns the way in which buildings within the district are related and connected. Overall, contributing buildings within the historic district retain a preponderance of the major design elements and character-defining features of PWA/WPA Moderne that aesthetically unify them on the exterior, including their rectangular plans, board-formed concrete walls, rounded stairwells clad in glass mosaic tiles, reflected ceilings, cross-shaped smooth-formed concrete posts, recessed entrances, and minimal use of tinted glass panels. Exterior alterations to the buildings include replacement of the original windows and doors on the two classroom buildings, the addition of exterior access doors, and the removal and subsequent filling in of windows on the west elevation facing North Lemon Street.

Although there is some evidence for the removal of original interior materials and fixtures, the reconfiguration of interior spaces on any campus is a common occurrence in response to changes in enrollment capacity, education pedagogy, and building functionality. Additionally, minor changes were made to the interior of the auditorium to accommodate modern technology.

In consideration of integrity of design, the campus buildings appear to retain the requisite integrity of the PWA/WPA Moderne stylistic elements that unify them into a readily identifiable, cohesive whole.

**Setting:** The area surrounding the Wilshire Junior High School buildings has noticeably changed since the 1930s. Originally set in an area of Fullerton bordering agricultural land, the surrounding residential and commercial development expanded along with the campus during the Wilshire Junior High School Historic District's period of significance. An L-shaped building (the Chapman School) originally stood at the corner of East Chapman Avenue and North Lemon Street, blocking the view of the Wilshire Junior High School buildings from East Chapman Avenue. That building was demolished at some point after Fullerton College acquired the property in 1984. There were also grass-covered sports fields east of the Wilshire Junior High School buildings, which were paved over for parking after 1984. Therefore, the Wilshire Junior High School Historic District retains partial integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, namely wood-frame construction on 4-foot stem walls with layered plaster surfaces and minimal ornamentation in the form of elegant, classical fluting. The windows and doors on two of the three buildings were replaced at some point, with the design of

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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replacement windows being sympathetic to the original building aesthetics. The third building, the auditorium, is largely unaltered. Therefore, the Wilshire Junior High School Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the smooth expanses of concrete that shapes the buildings and the purposeful use of classical forms expressed in modern aesthetics. Overall, the Wilshire Junior High School Historic District retains integrity of workmanship.

**Feeling:** The Wilshire Junior High School Historic District buildings strongly express the PWA/WPA Moderne aesthetic. The combination of Beaux-Arts classicism and Art Deco exuberance, expressed in a more conservative, understated way, incorporates classically balanced, symmetrical forms; vertically arranged recessed windows; expanses of smooth stucco or concrete surfaces; and vertically oriented fluting reminiscent of classically fluted columns. Combined with subtle, unadorned, broad belt courses and parapets crowned with horizontal recessed bands, the buildings radiate a feeling of monumentality and authority. Therefore, the Wilshire Junior High School Historic District retains integrity of feeling.

**Association:** The Wilshire Junior High School Historic District is not associated with any important historic events or people.

### 5.3.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicate that the original 1936 campus buildings appear to be eligible as a historic district under NRHP Criterion A/CRHR Criterion 1; NRHP Criterion C/CRHR Criterion 3; and local criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose most well-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke's School in San Francisco.

As a result of these findings, the Wilshire Junior High School Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.4 325–327 North Newell Place**

#### **5.4.1 NRHP/CRHR Evaluation Criteria**

**Criterion A/1:** *Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City’s population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton’s population boom laid the groundwork for the City’s residential architectural foundation. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

Although the property at 325–327 North Newell Place was built during this period of residential growth and development, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 325–327 North Newell Place does not appear eligible under NRHP/CRHR Criterion A/1.

**Criterion B/2:** *Is associated with the lives of persons important in our past.*

The 325–327 North Newell Place duplex appears to have been a rental property, with a long list of residents throughout its history. Although the building was built by J.R. Parker, who owned and built numerous homes in the vicinity of this property, archival research did not reveal any information about Parker being a significant historical figure. Archival research also failed to provide any additional significant information for any of the renters of the property over the years. Therefore, 325–327 North Newell Place does not appear eligible for listing under NRHP/CRHR Criterion B/2.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion C/3:**      *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

One of the most prevalent styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style, to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

The property at 325–327 North Newell Place is a California Bungalow style duplex built during the 1920s residential boom in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, low pitched roof design with roof overhangs, exposed rafter tails, and a large front porch with brick-and-wood supports. However, the subject property is a common and unremarkable example of the style.

Because the Craftsman style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of California Bungalows that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalow style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Craftsman style, the subject property appears not eligible for listing under NRHP/CRHR Criterion C/3.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion D/4:** *Has yielded, or may be likely to yield, information important in prehistory or history.*

The duplex is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion D/4.

### 5.4.2 Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 325–327 North Newell Place duplex does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 325–327 North Newell Place was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.4.1 under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.4.1 under Criterion C/3, the property is a common example of the Craftsman style and is one of many examples throughout the City. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Craftsman architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 6.

7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The duplex does not display outstanding attention architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1920s throughout Southern California. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the duplex, so there is no bearing on the preservation of other historic resources. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a duplex residence, the building cannot be classified as a natural environment. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 10.

### 5.4.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.4.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Evaluation of the building at 325–327 North Newell Place did not find it significant under NRHP/CRHR or local criteria; thus it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.4.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.5 420 East Chapman Avenue**

### **5.5.1 NRHP/CRHR Evaluation Criteria**

*Criterion A/I: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

Although the property at 420 East Chapman Avenue was built during this period of residential growth and development, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 420 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

**Criterion B/2:**        *Is associated with the lives of persons important in our past.*

Archival research for the 420 East Chapman Avenue property indicated that the original owner John R. Parker, who owned the property from 1920 to 1948, was an educator at Fullerton Elementary Schools and also owned other residential properties in the general vicinity of 420 East Chapman Avenue (FNT 1951). Following Parker's ownership, another educator, J.S. Arnold, took over ownership of the property from 1955 to 1959. Arnold was an educator at FJC and served as the Social Science Chair (FNT 1959). Following Arnold's ownership of the property it appears the property was turned into residential rental property, with numerous occupants over the years. No other significant information was found on other residents and/or owners of the property. Therefore, 420 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

**Criterion C/3:**        *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

One of the most prevalent styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style, to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

The property at 420 East Chapman Avenue is a California Bungalow style residence built during the 1920s residential boom in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, low pitched roof design with roof overhangs, exposed rafter tails, and a large front

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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porch with brick-and-wood supports. However, the subject property is a common and unremarkable example of the style.

Because the Craftsman style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of California Bungalows that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalow style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Craftsman style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 420 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.5.2        Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 420 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 420 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 1.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.5.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.5.1 under Criterion C/3, the property is a common example of the Craftsman style and is one of many examples throughout the City. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Craftsman architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1920s in Southern California. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the residence, so there is no bearing on the preservation of other historic resources. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 8.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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9. *A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.* Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. *Integrity as a natural environment that strongly contributes to the well-being of the people of the city.* Given the development of the parcel with a residence, the building cannot be classified as a natural environment. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### 5.5.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.5.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 420 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.5.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.6 416 East Chapman Avenue**

### **5.6.1 NRHP/CRHR Evaluation Criteria**

***Criterion A/1:*** *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional (DSD 2002; McAlester 2015).

Although the property at 416 East Chapman Avenue was built during the Depression era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the Depression era. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 416 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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***Criterion B/2: Is associated with the lives of persons important in our past.***

Archival research for the 416 East Chapman Avenue property indicated that the original owner was John R. Parker; however, it does not appear that Parker ever resided at the property, as he was residing at 420 East Chapman Avenue during the early years of this property. There were a series of occupants for the building over the years, which further suggests its use as a rental property. No other significant information was found on other residents and/or owners of the property. Therefore, 416 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

The Great Depression and the years leading up to WWII showed a rapid decline in architectural development in cities like Fullerton, until New Deal programs like the PWA/WPA and Federal Housing Administration (FHA) were established in the 1930s. The FHA allowed provided mortgage insurance and published standards for small, modest housing options to help bolster the housing market during the Depression era. With programs like the FHA, residential development in cities like Fullerton was able to continue and residents were able to make it through the Depression years.

Prior to the 1930s, housing in Fullerton was modest but stylized to popular and affordable styles like the California Bungalow. However, the Depression years brought about the rise of more modest and less stylized home styles like Minimal Traditional, which would gain increased popularity during the war and post-war years because of its affordability, accessibility, and ease of construction. The Minimal Traditional style dominated the Southern California landscape during the 1930s and 1940s and provided a cost-effective housing option for veterans and families. Although typically built in housing tracts, Minimal Traditional homes are seen in earlier residential neighborhoods intermixed with California Bungalows (NRB 2002).

The property at 416 East Chapman Avenue is a Minimal Traditional style residence built during the Depression era in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, simple low pitched gabled roof with composition shingles, exterior clad in stucco, and a bay window with multi-paned windows. However, the subject property is a common and unremarkable example of the style (McAlester 2015).

Because the Minimal Traditional style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of Minimal Traditional residences that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the historic district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Minimal Traditional style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 416 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.6.2        Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 416 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 416 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.6.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with person or persons or groups who significantly contributed to the culture

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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and development of the City. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 3.

4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.6.1 under Criterion C/3, the property is a common example of the Minimal Traditional style and is one of many examples throughout the City. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Minimal Traditional architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1930s throughout Southern California. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the residence, so there is no bearing on the preservation of other historic resources. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the subject property, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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cannot be classified as a natural environment. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### **5.6.3 Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.6.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 416 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.6.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### 5.7 418 East Chapman Avenue

#### 5.7.1 NRHP/CRHR Evaluation Criteria

**Criterion A/I:** *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City of Fullerton due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional that would flourish in the 1940s (DSD 2002; McAlester 2015).

Post WWII Fullerton experienced a housing boom that continued until the 1970s due to the influx of veterans and the availability of land due to new City annexations. The housing boom was marked by the need for rental housing options for returning soldiers, because a great number of them were single. Duplexes and small apartment buildings became much more popular during this era and provided temporary relief for housing shortages. Throughout Fullerton, the popularity of tract housing emerged as an affordable and accessible housing option that could be built very quickly (Mudrick et al. 2015).

Although the property at 418 East Chapman Avenue was built during the important boom era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the post-war era. Due to a lack of



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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significant contributions to the broad pattern of history or cultural heritage, the property located at 418 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

**Criterion B/2:**            *Is associated with the lives of persons important in our past.*

Archival research revealed a series of occupants for the building over the years, which is consistent with its function as a duplex rental unit. No other significant information was found on other residents and/or owners of the property. Therefore, 418 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

**Criterion C/3:**            *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

Prior to the 1950s, housing in Fullerton was largely modest and affordable with styles like the California Bungalow and Minimal Traditional. However, the post-war era in Fullerton sparked mass produced housing options on a scale never seen before in Fullerton in the form of tract housing. Innovators of tract housing developments in Fullerton like the Jewett Brothers were able to build homes in as little as 3 days. The following quote from *Fullerton: The Boom Years* sheds light on the housing boom in Fullerton in the 1950s:

In 1955 alone, the city approved fifty-five new tracts for a total of 3,941 lots, with the tracts ranging in size from 12 to 205 lots. By August 24, 1955, city staff reported that twenty-seven homes were being added to the city's residential areas every weekday (Mudrick et al. 2015).

The property at 418 East Chapman Avenue is an example of a post-war tract house in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, modesty in scale and massing, simple low pitched hipped roof with composition shingles, exterior clad in stucco, poured concrete foundation, metal windows, little to no ornamentation, rectangular plan, and a box-like aesthetic. However, the subject property is a common and unremarkable example of the style (NRB 2002; McAlester 2015).

The tract houses of Fullerton were modest in size and scale, and tended to be rectangular and boxy with little to no ornamentation.

Because the tract house style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of tract house residences that lack high artistic value but share

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the tract house style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 418 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.7.2        Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 418 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 418 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.7.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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culture and development of the City. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 3.

4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.7.1 under Criterion C/3, the property is a common example of the tract house style and is one of many examples throughout the City. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of tract house architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1950s throughout Southern California. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the duplex, so there is no bearing on the preservation of other historic resources. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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cannot be classified as a natural environment. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### **5.7.3 Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.7.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 418 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Aerial photographs show how post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.7.4 Conclusions**

As a result of the significance evaluation, the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.8 409 North Newell Place**

### **5.8.1 NRHP/CRHR Evaluation Criteria**

**Criterion A/1:** *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties on the project site are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional that would flourish in the 1940s (DSD 2002; McAlester 2015).

Post WWII Fullerton experienced a housing boom that continued until the 1970s due to the influx of veterans and the availability of land due to new City annexations. The housing boom was marked by the need for rental housing options for returning soldiers, because a great number of them were single. Duplexes and small apartment buildings became much more popular during this era and provided temporary relief for housing shortages. Throughout Fullerton, the popularity of Mid-Century Modern housing styles emerged as an affordable and accessible housing options (Mudrick et al. 2015).

Although the property at 409 North Newell Place was built during the important boom era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the post-war era. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 409 North Newell Place does not appear eligible under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Archival research revealed a series of occupants for the building over the years, which is consistent with its function as a multi-family rental unit. No other significant information was found on other residents and/or owners of the property. Therefore, 409 North Newell Place does not appear eligible under NRHP/CRHR Criterion B/2.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion C/3:**      *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

Prior to the 1950s, housing in Fullerton was largely modest and affordable with styles like the California Bungalow and Minimal Traditional. However, the post-war era in Fullerton sparked the need for efficient and higher-density housing options such as duplexes and apartment buildings. One of the popular styles for apartment buildings in the post-war era was Mid-Century Modern, as it was more stylized than the popular tract house forms but was also able to be constructed with easily accessible and cost-effective building materials.

The property at 409 North Newell Place is an example of a Mid-Century Modern apartment building in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: two-story height, exterior staircase, flush-mounted metal windows, low pitched roof design, exterior clad in stucco, and a second-floor balcony with modestly detailed railing. However, the subject property is a common and unremarkable example of the style (NRB 2002; McAlester 2015).

The building at 409 North Newell Place is a common and unremarkable example of a prevalent architectural style in Southern California and does not possess high artistic value. The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the historic district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Mid-Century Modern style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**      *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 409 North Newell Place does not appear eligible for listing under NRHP/CRHR Criterion D/4.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### 5.8.2 Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 409 North Newell Place residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 409 North Newell Place was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.8.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.8.1 under Criterion C/3, the property is a common example of the Mid-Century Modern style and is one of many examples throughout the City. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Mid-Century Modern architecture that retain integrity of materials and design and embody the characteristics of the style. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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residential construction using materials and techniques that were used throughout the 1950s throughout Southern California. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 7.

8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the apartment building, so there is no bearing on the preservation of other historic resources. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the apartment building, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building cannot be classified as a natural environment. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 10.

### 5.8.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.8.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 409 North Newell Place did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Aerial photographs show how post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.8.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

### **5.9 428, 434, and 438 East Chapman Avenue**

In 2015, GPA evaluated three properties on the project site located at 428, 434, and 438 East Chapman Avenue and reached the following conclusions from their evaluations:

None of the properties at 428, 434, or 438 East Chapman Avenue are currently designated under any national, state, or local landmark programs. They were evaluated in this report as part of the CEQA compliance process. None of the properties appear to be eligible for listing in the National Register, California Register, or for designation as a Fullerton Historical Landmark due to a lack of historical or architectural significance. In the case of the property at 438 East Chapman Avenue, its eligibility is also affected by its lack of integrity. Additionally, none of the properties appear to contribute to a potential historic district. The recommended evaluation code for all properties on the project site is 6Z, ineligible for designation at the national, state, and local levels through survey evaluation. Therefore, the properties at 428, 434, and 438 East Chapman Avenue are not historical resources subject to CEQA. As the project will have no impact on historical resources, no further study is recommended or required (GPA 2015).

Dudek reviewed the GPA report from 2015 in its entirety and concurs with the findings presented in the report by GPA. Given the extensiveness of the survey and its recent date of evaluation, Dudek does not feel that any further study is necessary on these properties.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

## 6 IMPACTS ANALYSIS

Based on the information contained in the *Proposed Facilities Master Plan Updates* (District 2016b), some Master Plan elements will be assessed at the program level because specific project details are not known at this time. Other Master Plan elements have detailed information available and will receive project-level assessment. As described in the project description (Section 1.2), the District is proposing various improvements to the Fullerton College Campus that include new construction, renovation, and demolition. The following paragraphs provide an impacts analysis of all proposed activities. Table 7 provides an overview of all identified impacts to historical resources and any associated mitigation measures to reduce impacts (see Section 6.5, Recommended Mitigation, for full text of mitigation measures).

**Table 7  
Summary of Impacts and Mitigation**

Building/Structure	Level of Impact Before Mitigation	Identified Impacts	Level of Impact After Mitigation
<i>Demolition (Project Level)</i>			
Berkeley Center (3000)	<b>Significant</b>	The Berkeley Center is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1
Horticulture (1600)	Less than significant	The horticulture complex was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant  No mitigation required
Theatre Arts (1300)	<b>Significant</b>	The Theatre Arts building is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1
Music (1100)	<b>Significant</b>	The Music building is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7**  
**Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Student Services (2000)	Less than significant	The Student Services building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Media Services-Academic Computing-Maintenance and Operation Shops (2300)	Less than significant	The temporary Media Services building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Classrooms (1955-1960)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
Classrooms (1901-1904)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
Office (2200)	Less than significant	The temporary Micro Computer Lab building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Child Development (1800, 1810, 1820, and 1830)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
<b>Demolition (Program Level)</b>			
428, 434, and 438 East Chapman Avenue and 400 North Newell Place	Less than significant	These buildings were found not eligible under all NRHP, CRHR and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
<b>Renovation (Project Level)</b>			
Math (600)	<b>Potentially significant</b>	<p>The Math building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include:</p> <ul style="list-style-type: none"> <li>-alteration/removal of interior CDFs</li> <li>-new exterior fenestrations for air intakes</li> <li>-replacement of original handrails</li> <li>-ADA renovations</li> </ul>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Physical Education (1200)	<b>Potentially significant</b>	<p>The PE building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -ADA renovations</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Wilshire Theatre (2100)	<b>Potentially significant</b>	<p>The Wilshire Theatre was found eligible as a contributor to the Wilshire Junior High School Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -alteration/removal of interior CDFs -ADA renovations -addition of new box office</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Business (300)	<b>Potentially significant</b>	<p>The Business building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building. However, more detail is needed to fully assess the level of impact.</p> <p>Potentially significant impacts include: -alteration/removal of interior CDFs -alteration/removal of exterior CDFs -new exterior fenestrations for air intakes -replacement of original handrails -ADA renovations</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Humanities (500)	<b>Potentially significant</b>	<p>The Humanities building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -reconstruction of stairs and ramps -application of board form finish on exterior -application of roof tiles</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Campus Services (840)	<b>Potentially significant</b>	The Campus Services building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -addition of testing space -doorway modifications and other ADA renovations	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Administration Building (100)	<b>Potentially significant</b>	The Administration building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -renovation of front upon removal of 1950s addition -renovation to entrance and basement	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Fine Arts Gallery (1000)	<b>Potentially significant</b>	The Fine Arts Gallery building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -installation of new glass doors -application of board form finish to exterior -replacement of elevator -replacement of handrails	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Academic Computing (3100)	Less than significant	The Academic Computing building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant  No mitigation required
<b><i>New Construction (Project Level)</i></b>			
Welcome Center	<b>Potentially significant</b>	See Demolition section above for a discussion of impacts related to demolition of the Music building (1100).  Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
New Instructional Building	<b>Potentially significant</b>	The proposed design/style of the new building is currently unknown.  Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Horticulture and Vocational Services Center	Less than significant	Although the proposed design/style of the new buildings is currently unknown, the proposed location of the new building is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Centennial Parking Structure	Less than significant	The proposed location of the new parking structure is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Pedestrian Bridge	Less than significant	The proposed location of the new bridge is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction. Further, the bridge will only connect with new construction.	Less than significant  No mitigation required
Realignment of Campus Access to the Centennial Parking Structure	Less than significant	The proposed location of the campus access realignment is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Parking Lots	Less than significant	See Demolition section above for a discussion of impacts related to demolition of the Berkeley Center building (3100); Theatre Arts building (1300); and 428, 434, and 438 E. Chapman Avenue and 400 N. Newell Place residential buildings.  The proposed location of the new parking lots will not impact any adjacent historical resources.	Less than significant  No mitigation required



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Maintenance and Operation Facility, Chiller Plant Addition, and Thermal Energy Storage	Less than significant	<p>The proposed location of the new Maintenance and Operation Facility is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.</p> <p>The Chiller Plant was is of recent construction and is at a significant distance from any historic district buildings.</p> <p>The proposed thermal energy storage tank building addition is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.</p>	<p>Less than significant</p> <p>No mitigation required</p>
Aquatics Center	Less than significant	The pool area is of recent construction, so construction of the new shower/locker room will not impact surrounding historical resources.	<p>Less than significant</p> <p>No mitigation required</p>
Performing Arts Complex	<b>Potentially significant</b>	<p>See Renovation section above for a discussion of impacts related to renovation of the Wilshire Theatre.</p> <p>Although the proposed Performing Arts Complex will block the view of the Wilshire Junior High School Historic District from Chapman Avenue, the district was blocked by two buildings (part of the Chapman School) during its period of significance. The existing sculpture garden was installed relatively recently (between 1980 and 1995) and does not contribute to the significance of the district or its historic setting. However, construction of the new building in close proximity to the Wilshire Junior High School Historic District has the potential for construction-related impacts.</p>	Less than significant after implementation of MM-CUL-3

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7**  
**Summary of Impacts and Mitigation**

Building/Structure	Level of Impact Before Mitigation	Identified Impacts	Level of Impact After Mitigation
<i>New Construction (Program Level)</i>			
Chapman–Newell Instructional Building	<b>Potentially significant</b>	See Demolition section above for a discussion of impacts related to removal of the 428, 434, and 438 E. Chapman Avenue and 400 N. Newell Place residential buildings.  Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
<i>Site Improvement Elements</i>			
Parking/Vehicular Entry Improvements	Less than significant	None of the proposed on-campus circulation improvements appear to be near historical resources, nor would they disrupt any historic patterns of circulation.	Less than significant  No mitigation required
Pedestrian Circulation	<b>Potentially significant</b>	Although no specific information is known at this time, potential significant impacts include: -disruption of existing spatial relationships. -alteration of historic district CDFs.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Infrastructure Improvements	<b>Potentially significant</b>	Although no specific information is known at this time, potential impacts resulting from infrastructure improvements include: - exterior modifications to historic buildings to accommodate new utility connections.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

CDF = character-defining feature; ADA = Americans with Disabilities Act.

## 6.1 Proposed Demolition

The proposed project includes the demolition of multiple buildings as part of implementation of the Facilities Master Plan. These buildings include the Berkeley Center (3000), Horticulture (1600), Theatre Arts (1300), Music (1100), Student Services (2000), Media Services (2300), Classrooms 1955–1960, Classrooms 1901–1904, Office (2200), and Child Development (1800, 1810, 1820, and 1830) buildings. The project also proposes removal of the residences at 428, 434, and 438 East Chapman Avenue and 400 North Newell Place at a program level.

Three of the buildings proposed for demolition, the Berkeley Center (3000), Theatre Arts (1300), and Music (1100) buildings, are contributing elements of the Mid-Century Modern Campus Expansion Historic District on campus and are considered historical resources under CEQA.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Demolition of an historical resource constitutes “substantial adverse change” and is considered a significant effect on the environment (14 CCR 15064.5(b)) that cannot be mitigated below a level of significance. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate below a level of significance. Mitigation for demolition of these buildings is provided in Section 6.5 (see MM-CUL-1). It is recommended that a preservation alternative be explored as part of the EIR to avoid a significant impact.

The Horticulture (1600), Student Services (2000), Media Services (2300), Classrooms 1955–1960, Classrooms 1901–1904, Office (2200), and Child Development (1800, 1810, 1820, and 1830) buildings are not considered historical resources under CEQA. Therefore, demolition of these buildings would result in a less than significant impact. No mitigation is required.

### **6.2 Proposed Renovations**

The project proposes renovations to the following buildings as part of implementation of the Facilities Master Plan: Math (600), Physical Education (1200), Wilshire Theatre (2100), Business (300), Humanities (500), Campus Services (840), Administration (100), Fine Arts Gallery (1000), and Academic Computing (3100).

Eight of the nine buildings proposed for renovation are considered historical resources under CEQA. The Math (600), Business (300), Campus Services (840), and Administration (100) buildings are contributing elements of the Fullerton Junior College Campus Historic District; the Physical Education (1200), Humanities (500), and Fine Arts Gallery (1000) buildings are contributing elements of the Mid-Century Modern Campus Expansion Historic District; and the Wilshire Theatre (2100) is a contributing element of the Wilshire Junior High School Historic District. Therefore, it is necessary to evaluate potential impacts to these buildings resulting from the proposed renovation activities.

#### **6.2.1 Interior Renovations**

Most campus buildings have been subject to extensive interior renovations that have compromised their interior integrity. However, three buildings, Math (600), Business (300), and Administration (100), were found to retain interior character-defining features that contribute to the significance of the resources, and should be protected/preserved during campus renovation activities. All three of these buildings are contributors to the Fullerton Junior College Campus Historic District. Interior features that should be retained include the following:

- Recessed doorways
- Wood doors with stacked panels

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Decorative iron work (including stair railings; light fixtures in buildings 100 and 300)
- Barrel vault ceilings
- Brass door hardware

In thoughtful treatment of interior character-defining features, impacts to building interiors can be less than significant with mitigation incorporated (see MM-CUL-2 in Section 6.5).

### **6.2.2 ADA Compliance Renovations (Interior and Exterior)**

ADA compliance modifications are proposed for all buildings undergoing renovation. In order to avoid significant impacts to historical resources, the District shall complete these renovations in a manner that is sensitive to the architectural style of the buildings/historic districts. The Secretary of the Interior's Guidelines for Rehabilitation includes an "Accessibility" section which provides guidance for making modifications to historic buildings that are in compliance with current accessibility codes while still maintaining important character-defining features, spaces, and finishes. National Park Service Preservation Brief 32, *Making Historic Properties Accessible* (Jester and Park 1993), also provides specific guidance on how to make historic buildings ADA accessible while minimizing changes to historic materials and features. Impacts resulting from ADA compliance work can be less than significant with mitigation incorporated (see MM-CUL-2 in Section 6.5).

### **6.2.3 Exterior Renovations**

The following provides an overview of proposed renovation activities that will impact the exterior of historic buildings. The specific details of the proposed renovation activities for each individual building are not known. However, this list identifies proposed renovation activities with the potential to significantly impact historic buildings and structures on campus (note that this list does not constitute a complete/final list of proposed exterior renovations):

- ADA compliance modifications (all buildings)
- Incorporation of new exterior fenestrations/louvers for air intakes (Math 600 and Business 300)
- Changes to building access/entrances (Physical Education 1200, Wilshire Theatre 2100, Business 300, Administration 100, and Fine Arts Gallery 1000)
- Designated box office for the Wilshire Theatre (2100) building
- Application of board-formed finish and/or Spanish roof tiles on Humanities (500) and Fine Arts Gallery (1000) buildings to match the original campus buildings
- Demolition of 1957 addition on Administration (100) building

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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These proposed exterior renovations have the potential to adversely impact historical resources, because they are proposed for buildings that contribute to the historic district on campus. Further, the vast majority of the identified character-defining features are found on the buildings' exteriors. Most of the impacts associated with the above-described proposed exterior renovations will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). However, it is strongly recommended that some of the proposed changes be reconsidered, as they are unlikely to be mitigated below a level of significance. This includes the application of a board-formed concrete finish and Spanish roof tiles to the Humanities (500) and Fine Arts Gallery (1000) buildings. Because these are Mid-Century Modern style buildings, the application of Spanish Revival style details is considered incompatible with the existing style and aesthetic of the modern buildings, and does not conform to the Standards for Rehabilitation. If these proposed modifications are carried forward, they will likely result in a significant impact to historical resources. It is recommended that a preservation alternative be explored as part of the Program EIR to avoid a significant impact.

Some of the more substantial renovation activities have the potential to adversely impact adjacent historic buildings. In consideration of indirect impacts to adjacent buildings, it is strongly recommended that a preservation plan be developed that includes protection measures for historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

### **6.3 Proposed New Construction**

The project proposes construction of the following new facilities/elements on campus: Welcome Center, Instructional building, Horticulture and Vocational Services Center, Centennial Parking Structure, pedestrian bridge, campus realignment for access to new parking structure, parking lots, Maintenance and Operation Facility, Chiller Plant addition, Thermal Energy Storage, Aquatics Center, Performing Arts Complex, and Chapman–Newell Instructional building.

Much of the proposed new construction will occur in the recently developed northern portion of campus, at a significant distance from historic buildings. This includes the Horticulture and Vocational Services Center, Centennial Parking Structure, pedestrian bridge, campus realignment for access to new parking structure, parking lots, Maintenance and Operation Facility, Chiller Plant addition, Thermal Energy Storage, and Aquatics Center. Because there are no direct or indirect impacts identified for historical resources, no additional mitigation is required for these construction activities.

Construction of the proposed Welcome Center and Instructional buildings has the potential to adversely impact adjacent historic buildings. The new buildings' designs should take into account the massing,

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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size, scale, and architectural features in relation to adjacent historic buildings. Most of the impacts associated with new construction adjacent to historic buildings will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

Although the proposed Performing Arts Complex will block the view of the Wilshire Junior High School Historic District from Chapman Avenue, the district was blocked by two buildings (part of the Chapman School) during its period of significance. The existing sculpture garden was installed relatively recently (between 1980 and 1995) and does not contribute to the significance of the district or its historic setting. However, construction of the new building in close proximity to the Wilshire Junior High School Historic District creates a potential for construction-related impacts. In consideration of indirect impacts to adjacent buildings, it is strongly recommended that a preservation plan be developed that includes protection measures for historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

Construction of the proposed Chapman–Newell Instructional building has the potential to adversely impact adjacent historic buildings. The new buildings' designs should take into account the massing, size, scale, and architectural features in relation to the southerly adjacent East Townsite Historic District. Most of the impacts associated with new construction adjacent to historic buildings will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

### **6.4 Site Improvement Elements**

Various site improvement elements include new signage at campus entryways, clear and safe vehicular drop-offs, and creation of more pedestrian pathways.

#### **6.4.1 Parking/Vehicular Entry Improvements**

None of the proposed on-campus vehicular circulation improvements appear to be near historical resources, nor would they disrupt any historic patterns of circulation.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **6.4.2 Pedestrian Circulation**

The specific details of changes to existing pedestrian pathways on campus are not fully known. Therefore, proposed modifications must be considered a potentially significant impact to adjacent historical resources, because inappropriately modified pathways would potentially disrupt important spatial relationships and character-defining features within historic districts. Most of the impacts associated with pedestrian circulation improvements would be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

### **6.4.3 Infrastructure Improvements**

The connection of new utility lines to historic buildings has the potential to alter interior and exterior character-defining features. Therefore, proposed infrastructure improvements must be considered a potentially significant impact to historical resources. Most of the impacts associated with infrastructure improvements will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

## **6.5 Recommended Mitigation**

The following mitigation is recommended only after a thorough consideration of alternatives to activities that will result in substantial adverse change to historical resources on campus. Although the following mitigation measure will not reduce impacts below a level of significance, CEQA requires that all feasible mitigation be undertaken.

**MM-CUL-1** Prior to demolition of the Berkley Center (3000), Theatre Arts building (1300), and Music building (1100), the North Orange County Community College District (District) shall ensure preparation of Level II Historic American Building Survey (HABS) documentation in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation. Documentation shall be completed by a qualified historic preservation professional who meets the Secretary of the Interior's Professional Qualifications Standards for history or architectural history. The documentation shall capture the physical condition of the existing building with (1) existing drawings (where available), (2) photographs of the buildings with large-



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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format negatives using an experienced HABS photographer, and (3) a written narrative that includes a history and architectural description of the buildings and highlights their historical significance.

One original copy of the final HABS documentation packet shall be offered to the following entities:

- The Library of Congress HABS Collection (to be offered as a donation only)
- The South Central Coastal Information Center at California State University, Fullerton
- City of Fullerton Planning Department
- Fullerton College Library
- Fullerton Public Library Main Branch (Local History Room)
- Fullerton Heritage
- Orange County Public Library
- Orange County Archives
- Orange County Historical Society

The following mitigation is recommended to reduce potentially significant impacts to historical resources to a less than significant level:

**MM-CUL-2** Prior to the start of new construction, additions, renovations (including Americans with Disabilities Act (ADA) compliance work), or site improvements within or adjacent to historical resources, including buildings within the Fullerton Junior College Campus Historic District, the Fullerton College Mid-Century Modern Historic District, the Wilshire Junior High School Historic District, and the East Townsite and College Park residential historic districts, associated design schematics/project plans shall be reviewed for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, specifically, the Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Further, all proposed ADA compliance work shall reference both the "Accessibility Considerations" section of the Rehabilitation Guidelines and National Park Service Preservation Brief 32, Making Historic Properties Accessible to ensure that ADA compliance work minimizes changes to historic materials and features. The project plan/schematic design review shall be completed by a qualified architectural historian or historic preservation specialist

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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who meets the Secretary of the Interior's Professional Qualification Standards for Architectural History. Upon review, the qualified specialist may recommend changes/revisions to project plans in order to obtain conformance with the Standards for Rehabilitation. Alternatively, the District may choose to work with a preservation architect who meets the Secretary of the Interior's Professional Qualification Standards.

- MM-CUL-3** An appropriate level of protection shall be provided for adjacent district buildings during proposed new construction and renovation activities. A preservation plan shall be developed to provide these details. At a minimum, protective fencing shall be used during construction activities so district buildings are not inadvertently impacted. The preservation plan shall also examine the potential effects of vibration resulting from nearby demolition and construction activities. The final preservation plan shall be appended to the final set of construction plans.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## 7 SUMMARY AND MANAGEMENT RECOMMENDATIONS

### 7.1 Summary of Findings

#### 7.1.1 Built Environment

As a result of the significance evaluations for NRHP, CRHR, and City of Fullerton historical landmark eligibility criteria and integrity, the following historical resources were identified on the Fullerton College campus:

- **Fullerton Junior College Campus Historic District.** The original 1930s–1940s FJC Campus appears to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3, as well as City of Fullerton historical landmark criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district’s period of significance (1935–1942).
- **Mid-Century Modern Campus Expansion Historic District.** The buildings designed by William Henry Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect Taylor.
- **Music Building (Building 1100).** This building appears eligible as both a district contributor (of the Mid-Century Modern Campus Expansion Historic District) and an individual property under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, 7, 8, and 9, for its high artistic value associated with the New Formalism style and for its location prominently anchoring the southwest corner of campus.
- **Wilshire Junior High School Historic District.** The original 1936 Wilshire Junior High School campus buildings appear to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3 and City of Fullerton historical landmark criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose best-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke’s School in San Francisco.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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As a result of these findings, the proposed project has the potential to adversely impact historical resources (see Table 7 in Section 6, Impacts Analysis). Management recommendations to reduce impacts to historical resources are provided in Section 7.2.

### **7.1.2 Archaeology**

No archaeological resources were identified within the project site as a result of the CHRIS records search or Native American coordination. However, it is always possible that intact archaeological deposits are present at subsurface levels. For these reasons, the project site should be treated as potentially sensitive for archaeological resources. Management recommendations to reduce potential impacts to unanticipated archaeological resources and human remains during campus construction activities are provided in Section 7.2.

## **7.2 Management Recommendations**

### **7.2.1 Built Environment Resources**

It is recommended that the District explore a reasonable range of preservation alternatives in the Program EIR for proposed demolition activities that would result in a significant impact to identified historical resources. This includes demolition of the Berkeley Center (3000), Theatre Arts (1300), and Music (1100) buildings. Demolition of a historical resource constitutes “substantial adverse change” and is considered a significant effect on the environment (14 CCR 15064.5(b)) that cannot be mitigated below a level of significance. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate below a level of significance. Mitigation for demolition of these buildings is provided in Section 6.5 (see MM-CUL-1).

It is further recommended that the District make all proposed renovations and plans for new construction in conformance with the Secretary of the Interior’s Standards and Guidelines for Rehabilitation (see MM-CUL-2) in order to reduce potentially significant impacts to a less than significant level; finally, it is recommended that the District prepare a preservation plan that details how historical resources will be protected during renovations and adjacent demolition and construction activities (see MM-CUL-3).

### **7.2.3 Archaeological Resources**

#### **Unanticipated Discovery of Archaeological Resources**

In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082), the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery, may be warranted.

### **Unanticipated Discovery of Human Remains**

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, the County Coroner shall notify the NAHC in Sacramento within 24 hours. In accordance with PRC Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendant from the deceased Native American. The most likely descendant shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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**CONFIDENTIAL**  
**APPENDIX A**  
*Records Search Results*



# **APPENDIX B**

## ***NAHC and Native American Coordination***



**NATIVE AMERICAN HERITAGE COMMISSION**

1550 Harbor Blvd., Suite 100  
West Sacramento, CA 95691  
(916) 373-3710  
(916) 373-5471 FAX



January 19, 2017

Samantha Murray  
Dudek

Sent by E-mail: smurray@dudek.com

RE: Proposed Fullerton College Facilities Master Plan Project, City of Fullerton; La Habra and Anaheim USGS  
Quadrangles, Orange County, California

Dear Ms. Murray:

Attached is a contact list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. A search of the SFL was completed for the USGS quadrangle information provided with negative results.

**Our records indicate that the lead agency for this project has not requested a Native American Consultation List for the purposes of formal consultation.** Lists for cultural resource assessments are different than consultation lists. Please note that the intent of the referenced codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

**Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:
  - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
  - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and



- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.
2. The results of any archaeological inventory survey that was conducted, including:
    - Any report that may contain site forms, site significance, and suggested mitigation measures.
    - All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code Section 6254.10.
  3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission.
  4. Any ethnographic studies conducted for any area including all or part of the potential APE; and
  5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand will help to facilitate the consultation process.

The results of these searches and surveys should be included in the "Tribal Cultural Resources" section or in a separate subsection of the Cultural Resources section of the environmental document submitted for review. Please reference California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: [gayle.totton@nahc.ca.gov](mailto:gayle.totton@nahc.ca.gov).

Sincerely,



Gayle Totton, M.A., PhD.  
Associate Governmental Program Analyst

**Native American Heritage Commission  
Tribal Contact List  
Orange County  
1/19/2017**

***Gabrieleno Band of Mission  
Indians - Kizh Nation***

Andrew Salas, Chairperson  
P.O. Box 393  
Covina, CA, 91723  
Phone: (626) 926 - 4131  
gabrielenoindians@yahoo.com  
Gabrieleno

***Gabrieleno/Tongva San Gabriel  
Band of Mission Indians***

Anthony Morales, Chairperson  
P.O. Box 693  
San Gabriel, CA, 91778  
Phone: (626)483-3564  
Fax: (626)286-1262  
GTTribalcouncil@aol.com  
Gabrieleno

***Gabrielino /Tongva Nation***

Sandonne Goad, Chairperson  
106 1/2 Judge John Aiso St.,  
#231  
Los Angeles, CA, 90012  
Phone: (951)807-0479  
sgoad@gabrielino-tongva.com  
Gabrielino

***Gabrielino Tongva Indians of  
California Tribal Council***

Robert Dorame, Chairperson  
P.O. Box 490  
Bellflower, CA, 90707  
Phone: (562) 761 - 6417  
Fax: (562) 761-6417  
gtongva@gmail.com  
Gabrielino

***Gabrielino-Tongva Tribe***

Linda Candelaria, Co-Chairperson  
1999 Avenue of the Stars, Suite  
1100  
Los Angeles, CA, 90067  
Phone: (626)676-1184  
Gabrielino

***Juaneno Band of Mission  
Indians***

Sonia Johnston, Chairperson  
P.O. Box 25628  
Santa Ana, CA, 92799  
sonia.johnston@sbcglobal.net  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Belardes***

Matias Belardes, Chairperson  
32161 Avenida Los Amigos  
San Juan Capistrano, CA, 92675  
Phone: (949)293-8522  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Belardes***

Joyce Perry, Tribal Manager  
4955 Paseo Segovia  
Irvine, CA, 92603  
Phone: (949) 293 - 8522  
kaamalam@gmail.com  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Romero***

Teresa Romero, Chairperson  
31411-A La Matanza Street  
San Juan Capistrano, CA, 92675  
Phone: (949)488-3484  
Fax: (949)488-3294  
tromero@juaneno.com  
Juaneno

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Fullerton College Facilities Master Plan Project, Orange County.

February 14, 2017

9422.0001

Mr. Matias Belardes, Chairperson  
Juaneno Band of Mission Indians Acjachemen Nation  
32161 Avenida Los Amigos  
San Juan Capistrano, CA 92675

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Belardes:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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As part of the process of identifying cultural resources issues for this proposed project, Dudek contacted the California Native American Heritage Commission (NAHC) to request a Sacred Lands File (SLF) search and a list of Native American individuals and/or tribal organizations who may have knowledge of cultural resources in or near the proposed project site. The SLF search failed to indicate the presence of Native American cultural resources in the immediate project area.

A California Historical Resources Information System (CHRIS) records search was conducted for the proposed project site and a one-half-mile radius at the South Central Coastal Information Center (SCCIC). The SCCIC has no record of prehistoric or historic archaeological sites within

*Mr. Belardes:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*


the proposed project site. There is one previously recorded prehistoric resource approximately one-half-mile southwest of the proposed project site.

The NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project. If you have any knowledge of cultural resources that may exist within or near the proposed project site, please contact me directly at (760) 840-7556, [adorrler@dudek.com](mailto:adorrler@dudek.com), or at 3544 University Avenue, Riverside, CA 92501 within 15 days of receipt of this letter.

Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency, the NOCCCD, in writing (pursuant to Public Resources Code Section 21080.3.1 (b)).

Thank you for your assistance.

Sincerely,



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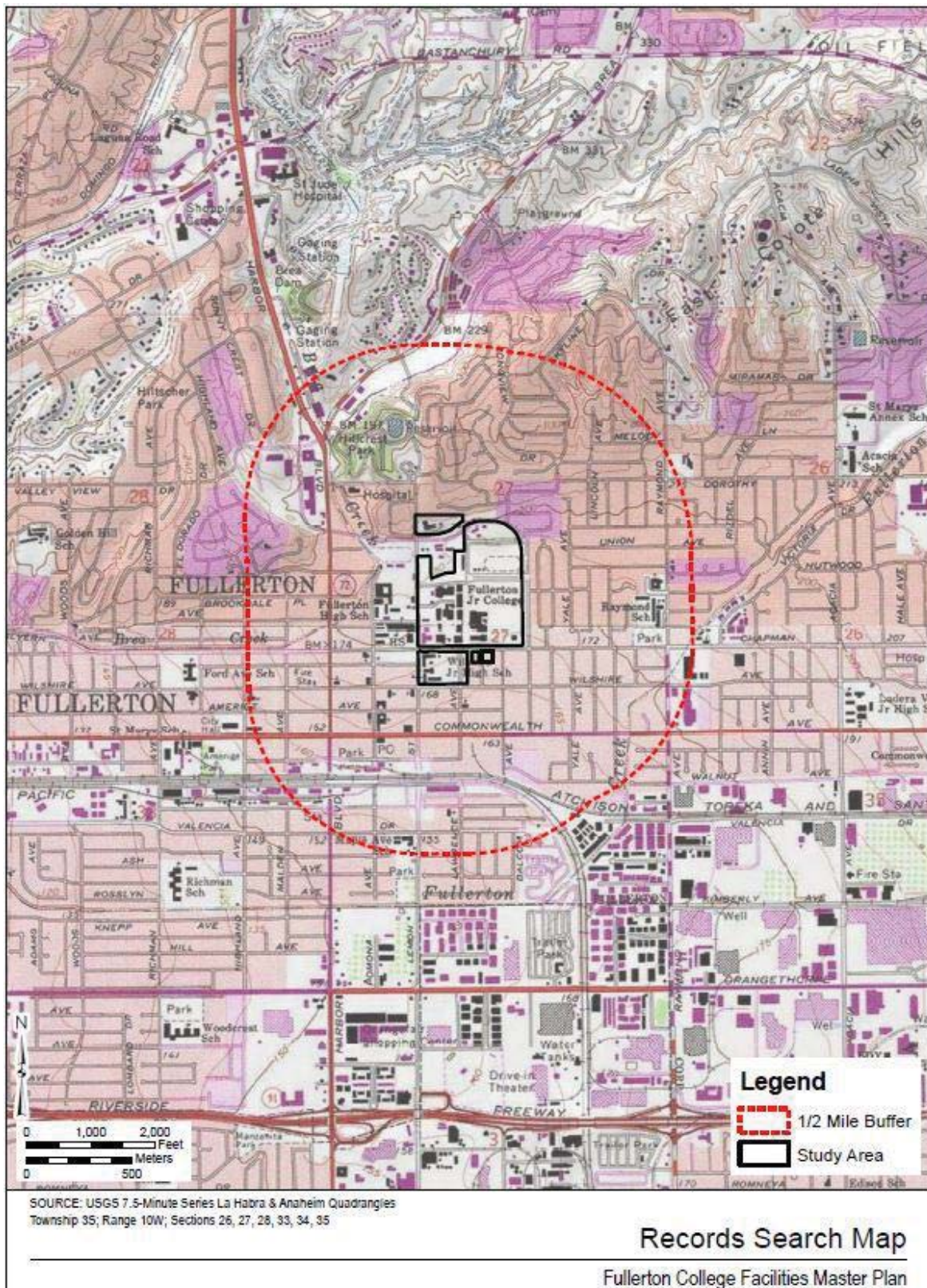
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Mr. Belardes:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Linda Candelaria, Chairwoman  
Gabrielino-Tongva Tribe  
1999 Avenue of the Stars #1100  
Los Angeles, CA 90067

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Candelaria:

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*Ms. Candelaria:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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Thank you for your assistance.

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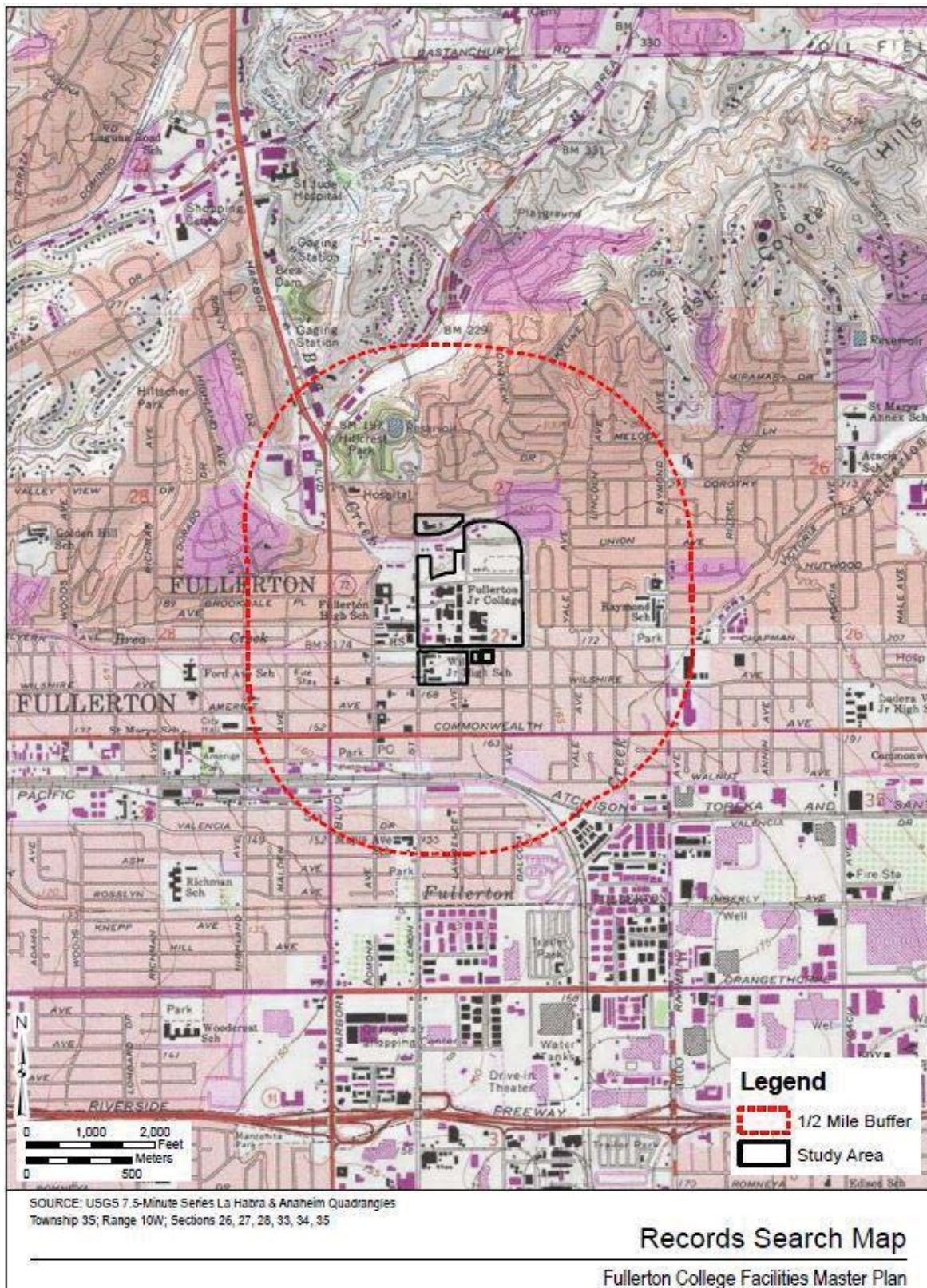
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Ms. Candelaria:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Mr. Robert F. Dorame, Tribal Chair/Cultural Resources  
Gabrielino Tongva Indians of California Tribal Council  
P.O. Box 490  
Bellflower, CA 90707

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Dorame:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Mr. Dorame:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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Sincerely,



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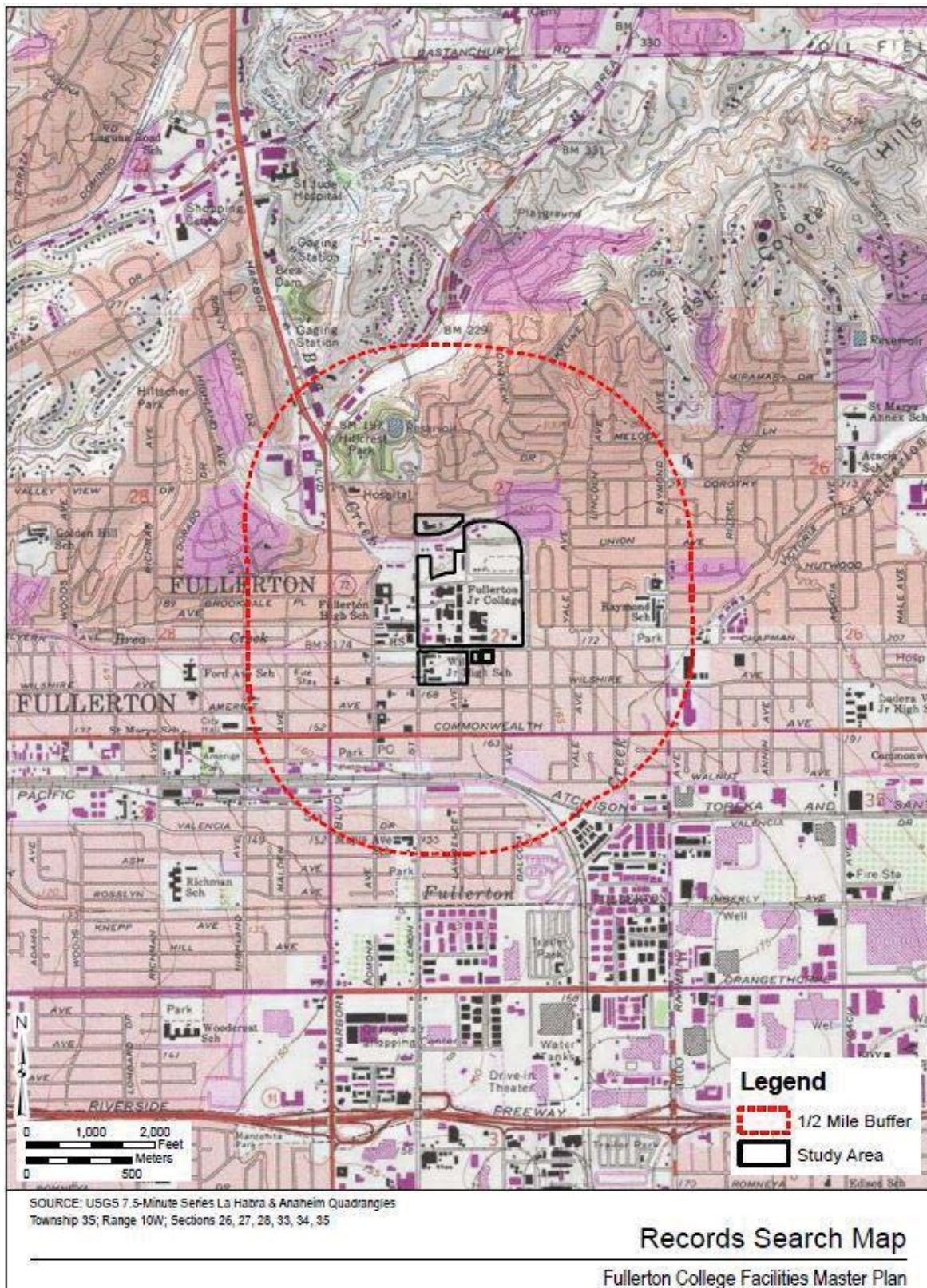
Adriane Dorrler  
Archaeologist

*Attachment.: Records Search Map*



Mr. Dorame:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Sandonne Goad, Chairperson  
Gabrielino-Tongva Nation  
106 1/2 Judge John Also St.  
Los Angeles, CA 90012

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Goad:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Ms. Goad:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*


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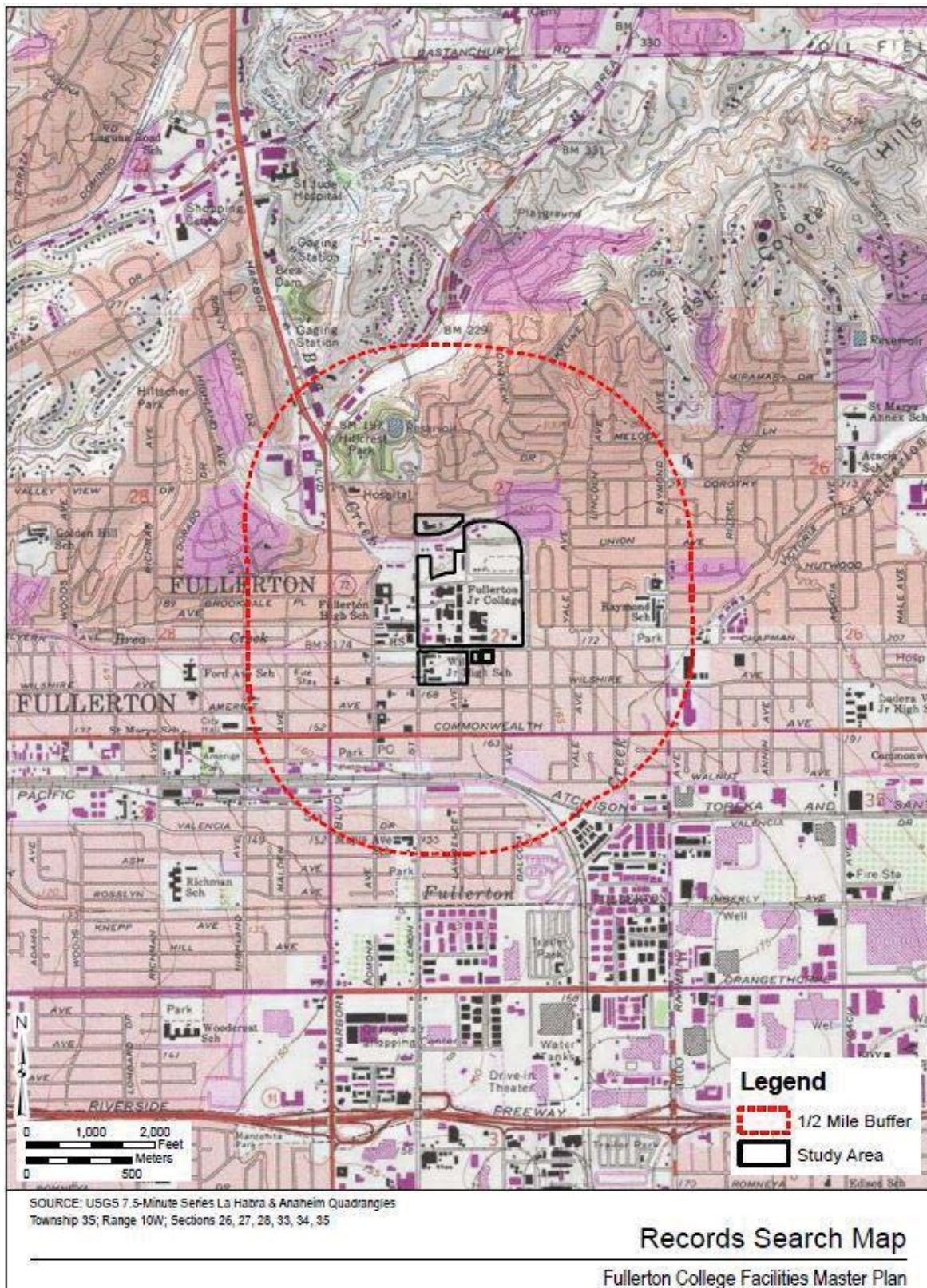
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Ms. Goad:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Ms. Sonia Johnston, Tribal Chairperson  
Juaneno Band of Mission Indians  
P.O. Box 25628  
Santa Ana, CA 92799

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Johnston:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Ms. Johnston:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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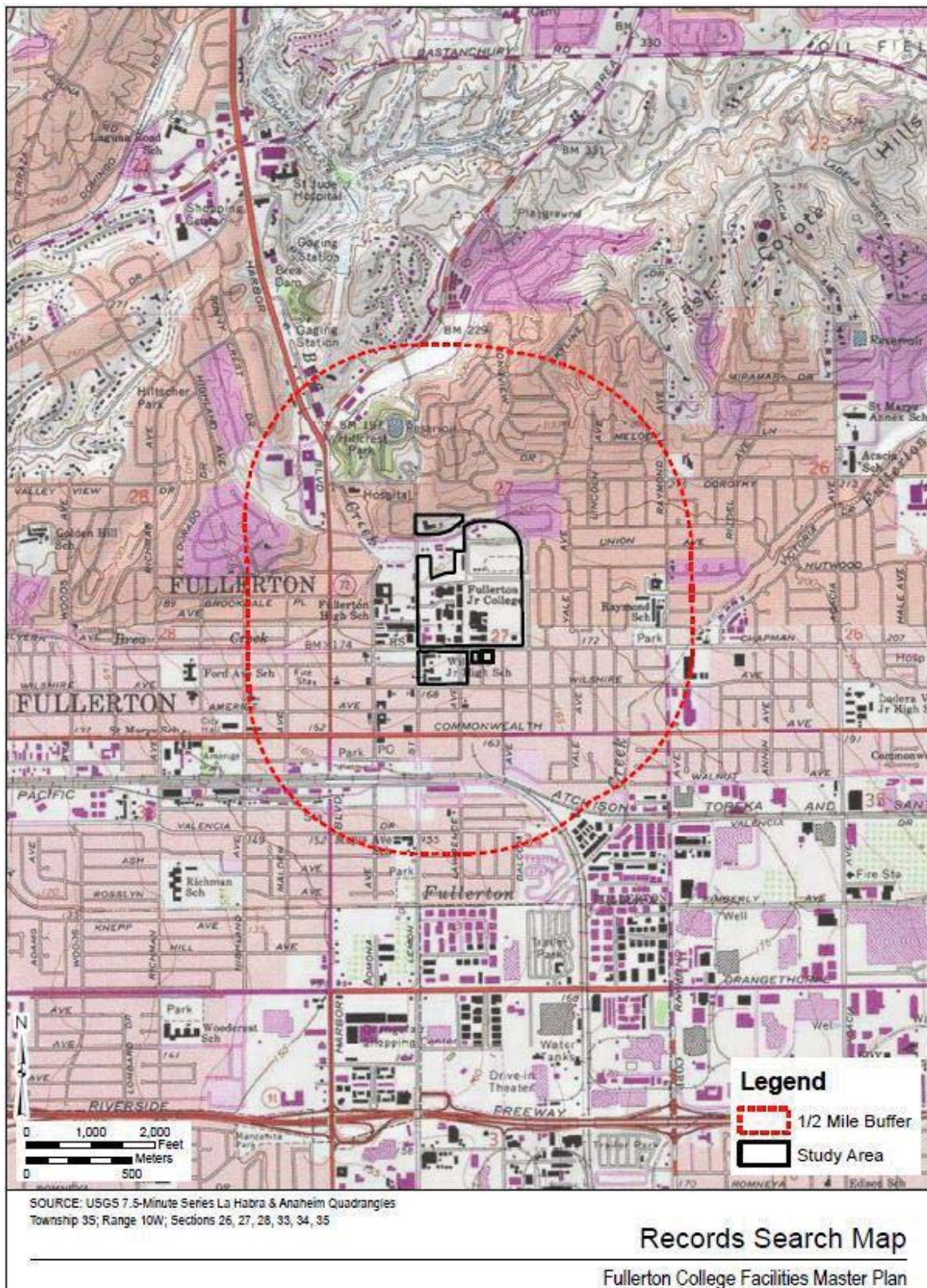
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Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*

Ms. Johnston:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Mr. Anthony Morales, Chairperson  
Gabrieleno/Tongva San Gabriel Band of Mission Indians  
P.O. Box 693  
San Gabriel, CA 91778

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Morales:

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*Mr. Morales:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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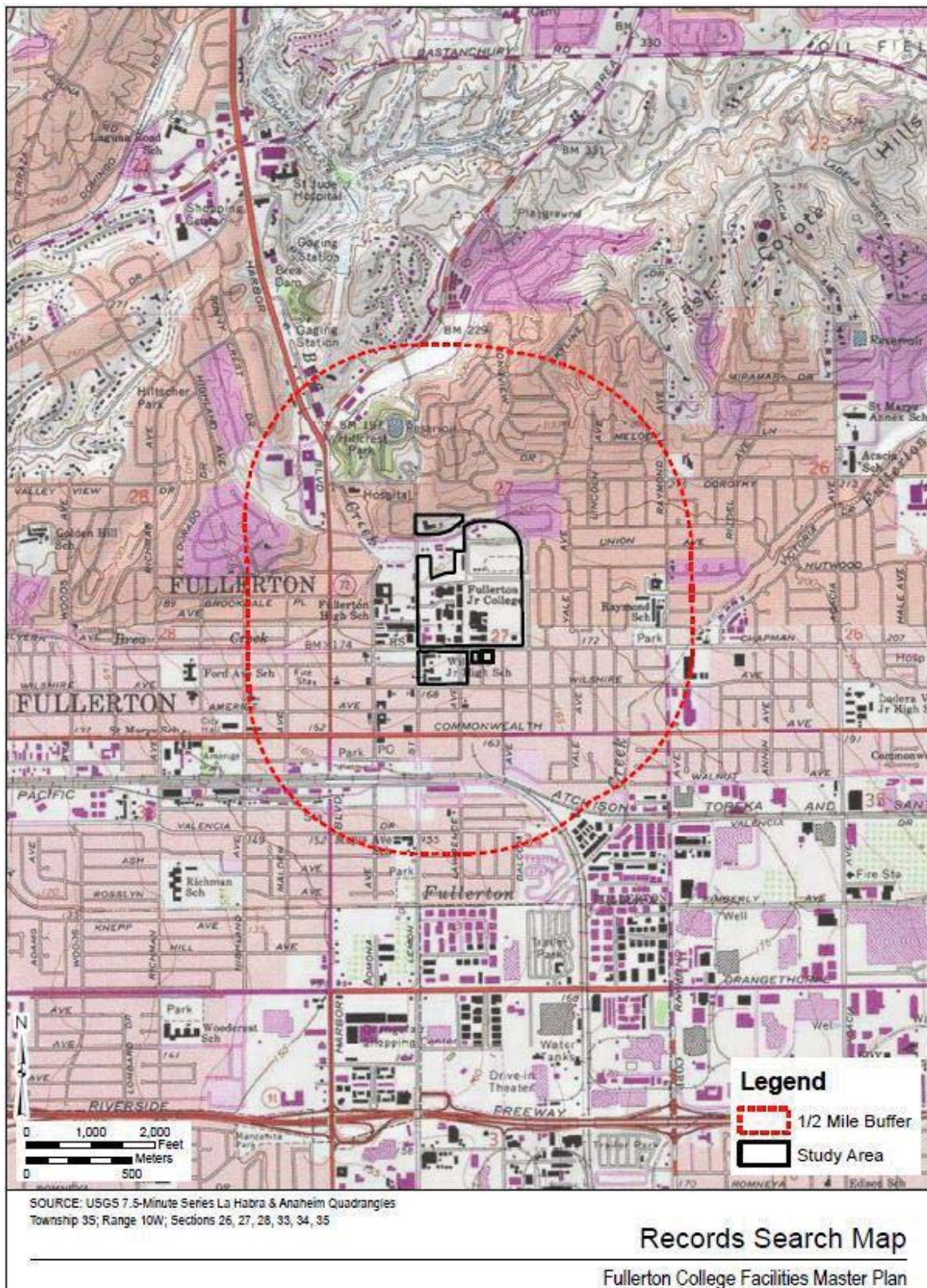
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Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*

Mr. Morales:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Ms. Joyce Perry, Representing Tribal Chairperson  
Juaneno Band of Mission Indians Acjachemen Nation  
4955 Paseo Segovia  
Irvine, CA 92612

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Perry:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

Fullerton College is located at 321 E. Chapman Avenue in the City of Fullerton (City) and occupies an approximately 70-acre site in northern Orange County. Specifically, Fullerton College is bounded by residential development to the north, south, and east and Fullerton Union High School to the west. The project area falls within Section 27 of Township 3 South, Range 10 West of the USGS 7.5-Minute *Anaheim* and *La Habra* Quadrangles (see attached map).

As part of the process of identifying cultural resources issues for this proposed project, Dudek contacted the California Native American Heritage Commission (NAHC) to request a Sacred Lands File (SLF) search and a list of Native American individuals and/or tribal organizations who may have knowledge of cultural resources in or near the proposed project site. The SLF search failed to indicate the presence of Native American cultural resources in the immediate project area.

A California Historical Resources Information System (CHRIS) records search was conducted for the proposed project site and a one-half-mile radius at the South Central Coastal Information Center (SCCIC). The SCCIC has no record of prehistoric or historic archaeological sites within the proposed project site. There is one previously recorded prehistoric resource approximately one-half-mile southwest of the proposed project site.



*Ms. Perry:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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The NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project. If you have any knowledge of cultural resources that may exist within or near the proposed project site, please contact me directly at (760) 840-7556, [adorrler@dudek.com](mailto:adorrler@dudek.com), or at 3544 University Avenue, Riverside, CA 92501 within 15 days of receipt of this letter.

Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency, the NOCCCD, in writing (pursuant to Public Resources Code Section 21080.3.1 (b)).

Thank you for your assistance.

Sincerely,



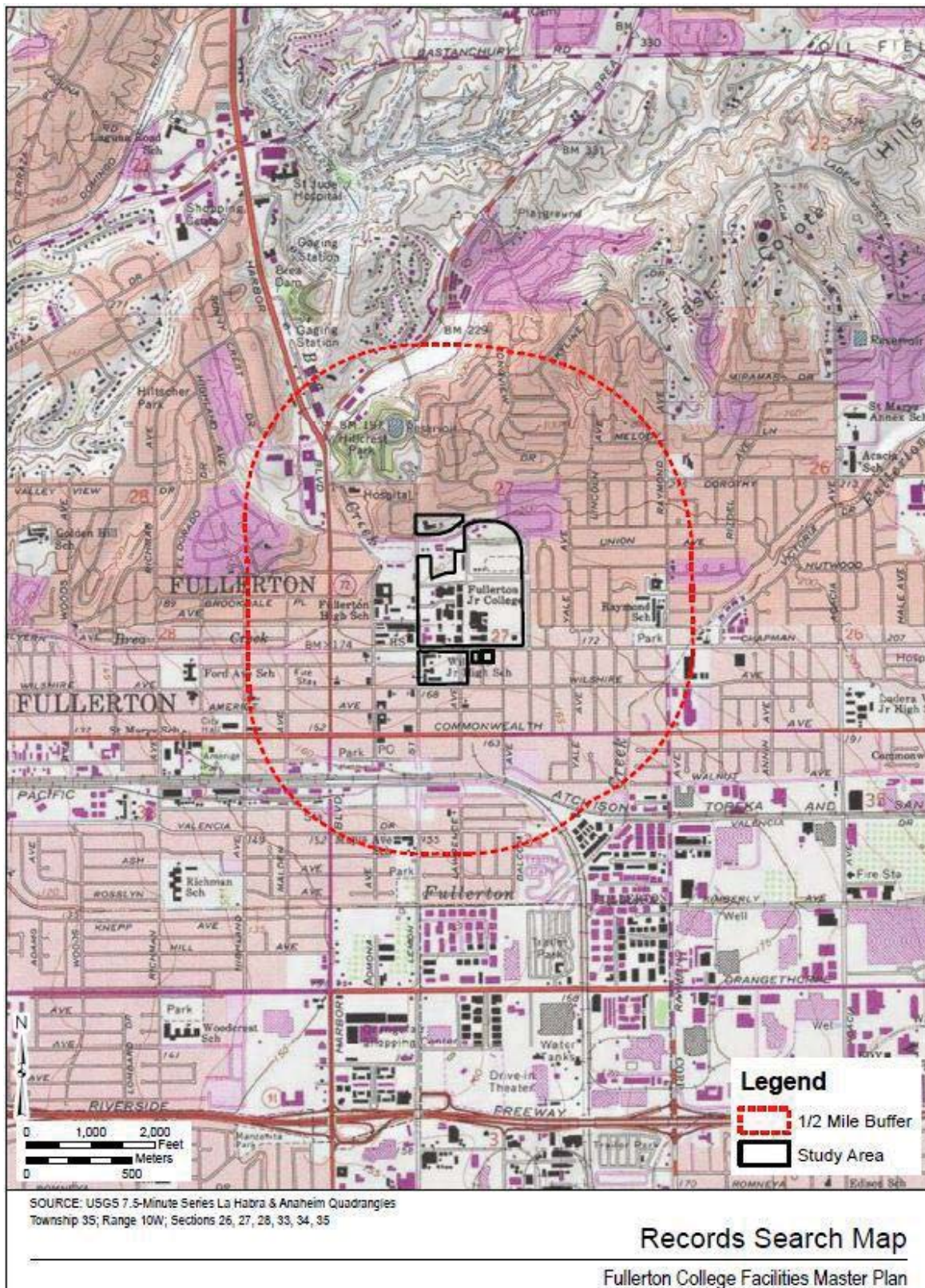
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Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*

Ms. Perry:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Teresa Romero, Chairwoman  
Juaneno Band of Mission Indians Acjachemen Nation  
31411-A La Matanza Street  
San Juan Capistrano, CA 92675

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Romero:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Ms. Romero:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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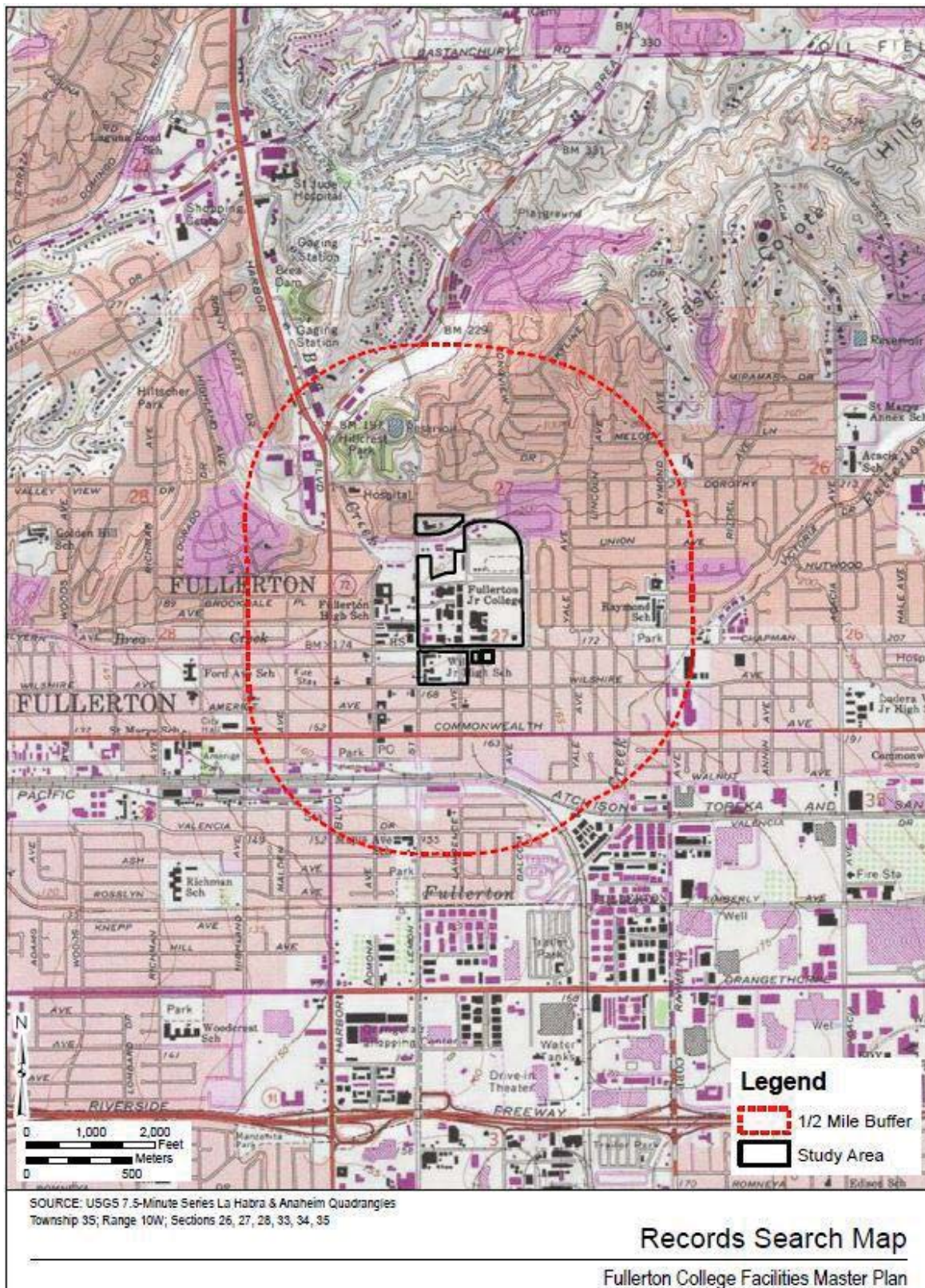
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Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*

Ms. Romero:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Mr. Andrew Salas, Chairperson  
Gabrielino Band of Mission Indians  
P.O. Box 393  
Covina, CA 91723

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Salas:

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*Mr. Salas:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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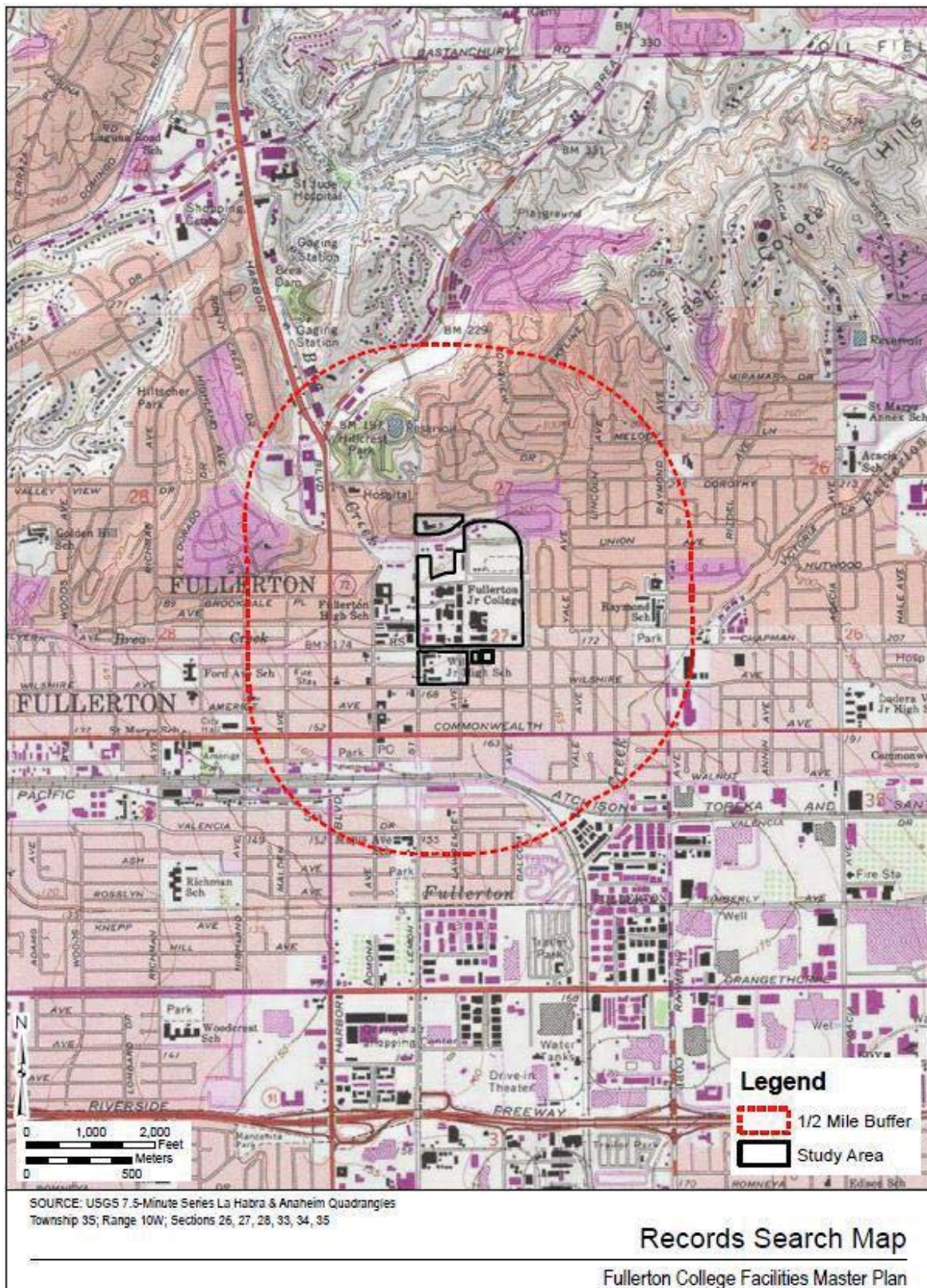
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Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*

Mr. Salas:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California







## GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION

Historically known as The San Gabriel Band of Mission Indians  
Recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Dear Adrienne Dorrlor,

**Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California**

"The project locale lies in an area where the Ancestral & traditional territories of the Kizh(Kitc) Gabrieleño villages adjoined and overlapped with each other, at least during the Late Prehistoric and Protohistoric Periods. The homeland of the Kizh (Kitc) Gabrieleños , probably the most influential Native American group in aboriginal southern California (Bean and Smith 1978a:538), was centered in the Los Angeles Basin, and reached as far east as the San Bernardino-Riverside area. The homeland of the Serranos was primarily the San Bernardino Mountains, including the slopes and lowlands on the north and south flanks. Whatever the linguistic affiliation, Native Americans in and around the project area exhibited similar organization and resource procurement strategies. Villages were based on clan or lineage groups. Their home/ base sites are marked by midden deposits, often with bedrock mortars. During their seasonal rounds to exploit plant resources, small groups would migrate within their traditional territory in search of specific plants and animals. Their gathering strategies often left behind signs of special use sites, usually grinding slicks on bedrock boulders, at the locations of the resources. Therefore, in order to protect our resources we're requesting one of our experienced & certified Native American monitor and an Professional Archeologist- Monitor to be on site during any & all ground disturbances (this includes but is not limited to pavement removal, pot-holing, or grubbing, auguring, boring, grading, excavation and trenching).

In all cases, when the NAHC states there are "No" records of sacred sites" in the subject area; they always refer the contractors back to the Native American Tribes whose tribal territory the project area is in. This is due to the fact, that the NAHC is only aware of general information on each California NA Tribe they are "NOT" the "experts" on our Tribe. Our Elder Committee & Tribal Historians are the experts and is the reason why the NAHC will always refer contractors to the local tribes.

In addition, we are also often told that an area has been previously developed or disturbed and thus there are no concerns for cultural resources and thus minimal impacts would be expected. I have two major recent examples of how similar statements on other projects were proven very inadequate. An archaeological study claimed there would be no impacts to an area adjacent to the Plaza Church at Olvera Street, the original Spanish settlement of Los Angeles, now in downtown Los Angeles. In fact, this site was the Gabrieleno village of Yangna long before it became what it is now today. The new development wrongfully began their construction and they, in the process, dug up and desecrated 118 burials. The area that was dismissed as culturally sensitive was in fact the First Cemetery of Los Angeles where it had been well documented at the Huntington Library that 400 of our Tribe's ancestors were buried there along with the founding families of Los Angeles (Pico's, Sepulveda's, and Alvarado's to name a few). In addition, there was another inappropriate study for the development of a new sports complex at Fedde Middle School in the City of Hawaiian Gardens could commence. Again, a village and burial site were desecrated despite their mitigation measures. Thankfully, we were able to work alongside the school district to quickly and respectfully mitigate a mutually beneficial resolution.

Given all the above, the proper thing to do for your project would be for our Tribe to monitor ground disturbing construction work. Native American monitors and/or consultant can see that cultural resources are treated appropriately from the Native American point of view. Because we are the lineal descendants of the vast area of Los Angeles and Orange Counties, we hold sacred the ability to protect what little of our culture remains. We thank you for taking seriously your role and responsibility in assisting us in preserving our culture.

With respect,

Please contact our office regarding this project to coordinate a Native American Monitor to be present. Thank You

Andrew Salas, Chairman  
Cell (626) 926-4131

Andrew Salas, Chairman  
Albert Perez, treasurer I

Nadine Salas, Vice-Chairman  
Martha Gonzalez Lemos, treasurer II

Christina Swindall Martinez, secretary  
Richard Gradias, Chairman of the council of Elders

Addendum: clarification regarding some confusions regarding consultation under AB52:

AB52 clearly states that consultation must occur with tribes that claim traditional and cultural affiliation with a project site. Unfortunately, this statement has been left open to interpretation so much that neighboring tribes are claiming affiliation with projects well outside their traditional tribal territory. The territories of our surrounding Native American tribes such as the Luiseno, Chumash, and Cahuilla tribal entities. Each of our tribal territories has been well defined by historians, ethnographers, archaeologists, and ethnographers – a list of resources we can provide upon request. Often, each Tribe as well educates the public on their very own website as to the definition of their tribal boundaries. You may have received a consultation request from another Tribe. However we are responding because your project site lies within our Ancestral tribal territory, which, again, has been well documented. What does Ancestrally or Ancestral mean? The people who were in your family in past times, Of, belonging to, inherited from, or denoting an ancestor or ancestors <http://www.thefreedictionary.com/ancestral>. . If you have questions regarding the validity of the “traditional and cultural affiliation” of another Tribe, we urge you to contact the Native American Heritage Commission directly. Section 5 section 21080.3.1 (c) states “...the Native American Heritage Commission shall assist the lead agency in identifying the California Native American tribes that are traditionally and culturally affiliated with the project area.” In addition, **please see the map below.**

CC: NAHC

APPENDIX 1: Map 1-2; Bean and Smith 1978 map.

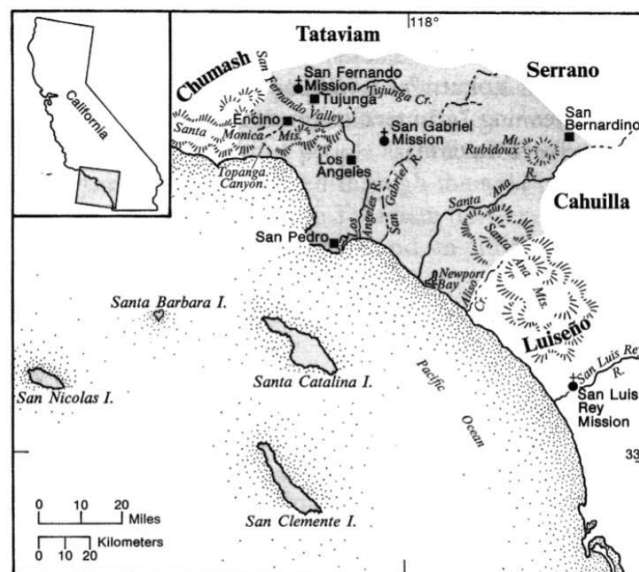


Fig. 1. Tribal territory.

The United States National Museum's Map of Gabrielino Territory:

Bean, Lowell John and Charles R. Smith  
1978 Gabrielino IN *Handbook of North American Indians, California*, Vol. 8, edited by R.F. Heizer, Smithsonian Institution Press, Washington, D.C., pp. 538-549

Andrew Salas, Chairman

Albert Perez, treasurer I

Nadine Salas, Vice-Chairman

Martha Gonzalez Lemos, treasurer II

Christina Swindall Martinez, secretary

Richard Gradias, Chairman of the council of Elders

# **APPENDIX C**

## *Preparers' Qualifications*





# Samantha Murray, MA

## Senior Architectural Historian and Built Environment Lead

Samantha Murray is a senior architectural historian with 12 years' professional experience in all elements of cultural resources management, including project management, intensive-level field investigations, architectural history studies, and historical significance evaluations in consideration of the California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), and local-level evaluation criteria. Ms. Murray has conducted hundreds of historical resource evaluations and developed detailed historic context statements for a multitude of property types and architectural styles, including private residential, commercial, industrial, educational, medical, ranching, mining, airport, and cemetery properties, as well as a variety of engineering structures and objects. She has also provided expertise on numerous projects requiring conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

### EDUCATION

California State University, Los Angeles  
MA, Anthropology, 2013

California State University, Northridge  
BA, Anthropology, 2003

### PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Society of Architectural Historians

National Trust for Historic Preservation

Ms. Murray meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Archaeology. She is experienced managing multidisciplinary projects in the lines of transportation, transmission and generation, federal land management, land development, state and local government, and the private sector. She has experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). She also prepared numerous Historic Resources Evaluation Reports (HRERs) and Historic Property Survey Reports (HPSRs) for the California Department of Transportation (Caltrans).

## Dudek Project Experience (2014-2017)

### Development

**Yosemite Avenue-Gardner Avenue to Hatch Road Annexation Project, City of Merced, Merced County, California.** Ms. Murray managed and reviewed the historic resource significance evaluation of a single-family residence/agricultural property within the proposed project site. The evaluation found the property not eligible under all NRHP and CRHR designation criteria. The project proposes to annex 70 acres from Merced County to the City of Merced and to construct and operate the University Village Merced Student Housing and Commercial component on an approximately 30-acre portion of the project site. No development is proposed on the remaining 40 acres.

**Schouten House Property Evaluation, California State University, Chico Research Foundation, Butte County, California.** Ms. Murray prepared a historic resource evaluation report and DPR form for a former single-family residence located at 2979 Hegan Lane in Butte County, California, in consideration of CRHR and local level eligibility criteria and integrity requirements. The University Research Foundation was proposing demolition of the property.

**Avenidas Expansion Project, City of Palo Alto, Santa Clara County, California.** Ms. Murray peer reviewed a historical resource evaluation report for the property at 450 Bryant Street. The peer review assessed the report's adequacy as an evaluation in consideration of state and local eligibility criteria and assessed the project's conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Robertson Lane Hotel Commercial Redevelopment Project, City of West Hollywood, California.** Ms. Murray is currently serving as architectural historian and peer reviewer of the historical evaluation report. The project involved conducting a records search, archival research, consultation with local historical groups, preparation of a detailed historic context statement, evaluation of three buildings proposed for demolition in consideration of local, CRHR, and NRHP designation criteria, and assistance with the EIR alternatives analysis.

**Rocketship Senter Road Public Elementary School Project, City of San Jose, Santa Clara County, California.** Ms. Murray served as architectural historian and prepared a historic resource evaluation report in compliance with the City of San Jose's historic preservation ordinance. Ms. Murray evaluated a 1960s church building in consideration of NRHP, CRHR, and local designation criteria and integrity requirements.

**Jack in the Box Drive Through Restaurant Project, City of Downey, Los Angeles County, California.** Ms. Murray served as architectural historian and lead author of the cultural resources study which included evaluation of two historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a records search, survey, and Native American Coordination.

**San Carlos Library Historical Resource Technical Report, City of San Diego, California.** Ms. Murray served as architectural historian and author of the Historical Resource Technical Report for the San Carlos Library. Preparation of the report involved conducting extensive building development and archival research on the library building, development of a historic context, and a historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements. The project proposes to build a new, larger library building.

**Historical Evaluation of 3877 El Camino Real, City of Palo Alto, California.** Ms. Murray served as architectural historian, originally providing a peer review of another consultant's evaluation. The City then asked Dudek to re-do the original evaluation report. As part of this work Ms. Murray conducted additional archival research on the property and evaluated the building for historical significance in consideration of local, state, and national designation criteria and integrity requirements. The project proposes to demolish the existing building and develop new housing.

**429 University Avenue Historic Resources Evaluation Report Peer Review, City of Palo Alto, California.** Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations, and is currently working on additional building studies for the City of Palo Alto.

**1050 Page Mill Road Historic Resources Evaluation Report Peer Review, City of Palo Alto, Santa Clara County, California.** Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations.

**Big Chico Creek Ecological Reserve (BCCER) Henning Property Historical Evaluation, California State University, Chico, California.** Ms. Murray authored the historical significance evaluation report for a property located at 3521 14 Mile House Road as requested by the California State University Chico Research Foundation. The property is historically known as the Henning Property and has served as the BCCER conference center in recent years. The Foundation is considering demolition of the existing property due to numerous safety concerns and the high cost associated with bringing the building up to current code requirements.

**635 S. Citrus Avenue Proposed Car Dealership MND, City of Covina, California.** Ms. Murray served as architectural historian and archaeologist, and author of the cultural resources MND section. The project proposes to convert an existing Enterprise Rent-a-Car facility into a car dealership. As part of the MND section, Ms. Murray conducted a records search, Native American coordination, background research, building permit research, and a historical significance evaluation of the property. The study resulted in a finding of less-than-significant impacts to cultural resources.

**8228 Sunset Boulevard Tall Wall Project, City of West Hollywood, California.** Ms. Murray prepared DPR forms and conducted building development and archival research to evaluate a historic-age office building. The project proposes to install a tall wall sign on the east side of the building.

**Historic Resource Evaluation of 8572 Cherokee Drive, City of Downey, California.** Ms. Murray served as architectural historian and project manager. She prepared a historical resource evaluation report and a set of DPR forms to evaluate a partially demolished residence that was previously determined eligible for inclusion in the NRHP (known as the Al Ball House). The current owner is proposing to subdivide the lot and develop four new homes.

**Montclair Plaza Expansion Project, City of Montclair, California.** Resources MND section, which included an evaluation of several department store buildings proposed for demolition. The project proposes to expand the existing Montclair Plaza Shopping Center.

**Foothill 533 IS/MND, City Ventures, City of Glendora, California.** Ms. Murray served as architectural historian, archaeologist, and author of the cultural resources IS/MND section. As part of the cultural study, Ms. Murray recorded and evaluated five historic-age commercial/industrial properties proposed for demolition as part of the project. The project proposes to develop a series of new townhomes.

**Normal Street Project, City of San Diego, California.** Ms. Murray served as architectural historian and co-author of the Historical Resources Technical Report for properties located at 3921-3923; 3925-3927; 3935 Normal Street for the City of San Diego's Development Services Department. Ms. Murray assisted with the final round of comments from the City and wrote the historical significance evaluations for all properties included in the project.

## Education

**Kings Beach Elementary School Modernization Project, Tahoe Truckee Unified School District, Tahoe City, Placer County, California.** Ms. Murray served as architectural historian and co-author of the cultural resources study. The study involved evaluation of the existing school for NRHP, CRHR and local eligibility, conducting archival and building development research, a records search, and Native American coordination.

**Cypress College Facilities Master Plan Program EIR, City of Cypress, Orange County, California.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Cypress College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray authored the cultural resources study for the project, which included a significance evaluation of all 1960s and 1970s buildings on campus proposed for demolition or renovation. As a result of the significance evaluation, including consideration of CRHR evaluation criteria and integrity requirements, the original 1960s–1970s campus appears to be eligible as a historic district under CRHR Criterion 3 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Brutalist style. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Tahoe Lake Elementary School Facilities Master Plan Project, Tahoe Truckee Unified School District, Tahoe City, Placer County, California.** Ms. Murray served as architectural historian and lead author of the cultural resources study. She recorded and evaluated the Tahoe Lake Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

**San Diego State University (SDSU) Open Air Theater Renovation Project, SDSU and Gatzke Dillon & Balance, LLP, San Diego, California.** Ms. Murray served as architectural historian and prepared a technical memorandum that analyzed the project's potential to impact the OAT theater (a contributing property to the San Diego State College NRHP Historic District). This included conducting a site visit, reviewing proposed site and design plans, and preparing a memorandum analyzing the project's conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

**Mt. San Jacinto College (MSJC) Master Plan Project, City of San Jacinto, Riverside County, California.** Ms. Murray served as architectural historian, archaeologist, and lead author of the cultural resources study. As part of the study she evaluated 11 buildings for NRHP, CRHR, and local level criteria and integrity requirements. The buildings were constructed prior to 1970 and proposed for demolition as part of the project. The study also entailed conducting extensive archival and building development research at District offices, a records search, and Native American coordination.

**San Diego State University (SDSU) Engineering and Sciences Facilities Project, SDSU and Gatzke Dillon & Balance, LLP, San Diego, California.** Ms. Murray served architectural historian, archaeologist, and lead author of the Cultural Resources Technical Report for the SDSU Engineering and Interdisciplinary Sciences Building Project. The project required evaluation of 5 historic-age buildings in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, an intensive level survey, Native American coordination, and a records search. The project proposes to demolish four buildings and alter a fifth as part of the university's plan to update its engineering and science facilities.

**Fullerton College Facilities Master Plan Program EIR, North Orange County Community College District, City of Fullerton, Orange County, California. 2017.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray co-authored and oversaw the cultural resources study. All buildings and structures on campus over 45 years old and/or or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA. As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**The Cove: 5th Avenue Chula Vista Project, E2 ManageTech Inc., San Diego, California.** Ms. Murray served as architectural historian and co-author of the CEQA report. The project involved recordation and evaluation of several properties functioning as part of the Sweetwater Union High School District administration facility, proposed for redevelopment, as well as an archaeological survey of the project area.

## Energy

**J-1351 Electrical Distribution and Substation Improvements and J-600 San Dieguito Pump Station Replacement Project, Santa Fe Irrigation, San Diego County, California.** Ms. Murray served as architectural historian and prepared the Department of Parks and Recreation (DPR) forms and associated memo concerning replacement of the original 1964 San Dieguito Pump Station. Ms. Murray recorded and evaluated the pump house for state and local significance and integrity considerations. As part of this effort she conducted background research, prepared a brief historic context, and a significance evaluation.

## Expert Witness

**Robert Salamone vs. The City of Whittier.** Ms. Murray was retained by the City of Whittier to serve as an expert witness for the defense. She peer reviewed a historic resource evaluation prepared by another consultant and provided expert testimony regarding the contents and findings of that report as well as historic resource requirements on a local and state level in

consideration of the City of Whittier's Municipal Code Section 18.84 and CEQA. Judgement was awarded in favor of the City on all counts.

## Healthcare

**Hamilton Hospital Residential Care Facility Project, City of Novato, Marin County, California.** Ms. Murray served as architectural historian, prepared a cultural resources study, and assessed the proposed project's design plans for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The project proposed to construct an addition and make alterations to an NRHP-listed district contributing property. With review from Ms. Murray, the project was able to demonstrate conformance with the Standards for Rehabilitation.

**Culver Place Assisted Living Project, DJB Architects, Culver City, California.** Ms. Murray served as architectural historian, archaeologist, and author of the Letter Report for a Cultural and Paleontological Resources Study. Ms. Murray conducted the intensive-level cultural resources survey of the project area, conducted background research, and coordinated with local Native American groups. The project proposes to construct an assisted living facility on a large private property in Culver City.

## Transportation

**SR-86 and Neckel Road Intersection Improvements and New Traffic Signal Light Project, Caltrans, City of Imperial, California.** Ms. Murray served as Principal Architectural Historian, and author of the HPSR and Finding of No Adverse Effect document. The project involved an intensive field survey, Native American and historic group coordination, a records search, and recordation and NRHP and CRHR evaluation of two historic drainage canals proposed for improvement as part of Caltrans intersection improvement project. All documents were signed and approved by Caltrans District 11 and the Caltrans Cultural Studies Office.

**California Boulevard Roundabout Project, OmniMeans, City of Napa, California.** Ms. Murray served as Principal Architectural Historian and Archaeologist, preparing of the Area of Potential Effects (APE) map and subsequent preparation of Caltrans documentation, including an Archaeological Survey Report (ASR), HRER, HPSR, and a Finding of No Adverse Effect with Standard Conditions. The HRER included an evaluation of 7 previously unrecorded properties for the NRHP and CRHR. The project proposes to modify and install a roundabout at California Boulevard and First Street in the City of Napa. All documents were signed and approved by Caltrans District 4 and the Caltrans Cultural Studies Office.

## Water/Wastewater

**Morena Reservoir Outlet Tower Replacement Project, City of San Diego, California.** Ms. Murray evaluated the 1912 Morena Dam and Outlet Tower for NRHP, CRHR, and local level eligibility and integrity requirements. The project entailed conducting extensive archival research and development research at City archives, libraries, and historical societies, and preparation of a detailed historic context statement on the history of water development in San Diego County.



**69<sup>th</sup> and Mohawk Pump Station Project, City of San Diego, California.** Ms. Murray served as architectural historian and lead author of the Historical Resource Technical Report for the pump station building on 69th and Mohawk Street. Preparation of the report involves conducting extensive building development and archival research on the pump station building, development of a historic context, and a historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements.

**Pump Station No. 2 Power Reliability and Surge Protection Project, City of San Diego, California.** Ms. Murray served as architectural historian and prepared an addendum to the existing cultural resources report in order to evaluate the Pump Station No. 2 property for NRHP, CRHR, and local level eligibility and integrity requirements. This entailed conducting additional background research, building development research, a supplemental survey, and preparation of a historic context statement.

**Orange County Central Utility Facility Upgrade, County of Orange Public Works, City of Santa Ana, Orange County, California.** To further the County's long-term goals of operational safety, improved efficiency, cost effectiveness, and supporting future campus development plans, the proposed Central Utility Facility Upgrade project consisted of improvements and equipment replacements recommended by the Strategic Development Plan for the CUF's original utility systems. Ms. Murray served as architectural historian and archaeologist, and prepared the cultural resources MND section. As part of this effort Ms. Murray conducted a detailed review of historic resource issues within and around the proposed project area to assess potential impacts to historic buildings and structures. The proposed project involved improvements to 16 buildings located within the Civic Center Campus. As a result of the cultural resources analysis, it was determined that the proposed project would not result in a substantial adverse change to any of the historic-age buildings or the associated Civic Center Plaza walkways/landscaping.

**Bear River Restoration at Rollins Reservoir Project, Nevada Irrigation District, Nevada and Placer Counties, California.** Ms. Murray served as architectural historian and co-author of the Cultural Resources Inventory Report. Ms. Murray conducted background research on the 1963 Chicago Park Powerhouse Bridge and prepared a historic context for the Little York Township and Secret Town Mine.

**Otay River Estuary Restoration Project (ORERP), Poseidon Resources, South San Diego Bay, California.** Ms. Murray served as architectural historian for the documentation of Pond 15 and its associated levees. The project proposes to create new estuarine, salt marsh, and upland transition habitat from the existing salt ponds currently being used by the South Bay Salt Works salt mining facility. Because the facility was determined eligible for listing in the NRHP, the potential impacts caused by breaching the levees, a contributing feature of the property, had to be assessed.

## **Other Project Experience (2008-2014)**

**LADPW BOE Gaffey Pool and Bathhouse Project, Los Angeles County, California (2014).** Ms. Murray served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. Ms. Murray reviewed proposed design plans for new construction within an NRHP-listed historic district for conformance with the Secretary of the Interior's Standards. The LADPW BOE proposed to

conduct various improvements to the Gaffey Street Pool and surrounding area, located in Upper Reservation of Fort McArthur in San Pedro, California.

**Metro Green Line to LAX Project (2013-2014).** Ms. Murray served as project manager for a multi-disciplinary project that includes cultural resources, biology, and paleontology. The Los Angeles County Metropolitan Transportation Authority (Metro), Federal Transit Administration (FTA), Federal Aviation Administration (FAA) and Los Angeles World Airports (LAWA) have initiated an Alternatives Analysis (AA)/Draft EIS/Draft EIR for the Metro Green Line to Los Angeles International Airport (LAX) project. The AA/DEIS/DEIR is being prepared to comply with NEPA and CEQA. This study will examine potential connections between the planned Metro Crenshaw / LAX Transit Corridor Project's Aviation/Century Station and the LAX Central Terminal Area (CTA) located approximately one mile to the west. Client: Terry Hayes Associates.

**LADPW BOE Downtown Cesar Chavez Median Project, Los Angeles County, California (2013).** Ms. Murray served as field director for the intensive-level cultural resources survey, and co-author of the Caltrans ASR and HRER. The City of Los Angeles Department of Public Works (LAPDW), Bureau of Engineering (BOE), proposes to provide for transportation enhancements along West Cesar Chavez Boulevard in the downtown area of Los Angeles. Client: LADPW BOE, Lead Agency: Caltrans, District 7.

**Edwards Air Force Base Historic Context and Survey, Multiple Counties, California (2013).** Ms. Murray served as lead architectural historian and project manager for survey and evaluation of 17 buildings and structures located throughout the base, and preparation of a Cold War historic context statement, an analysis of property types, and registration requirements for all built environment resources on base. Client: JT3/CH2M Hill.

**San Gabriel Trench Grade Separation Project (Phases I, II, and III); Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California (2008–2010, 2011–2014).** Ms. Murray served as Archaeologist, Architectural Historian, and Osteologist throughout various stages of the project. The project consisted of conducting a cultural resources assessment for a proposed grade separation located within the cities of San Gabriel, Alhambra, and Rosemead. The proposed project would lower a 2.2 mile section of Union Pacific Railroad tracks in the immediate vicinity of the historic Mission San Gabriel Arcángel. Ms. Murray was involved in both the archaeological and architectural history components of this project. This includes the archaeological and architectural history field surveys, archaeological testing of the site and completion of over 100 DPR forms for the evaluation of built environment resources. She also served as the on-site human osteologist. Client: Terry A. Hayes Associates, LLC. Agency: Caltrans.

**Azusa Intermodal Parking Facility Project, Azusa, Los Angeles County, California (2012).** Ms. Murray served as field director, assistant project manager, and primary report author for the intensive-level cultural resources survey and cultural resources technical report, which included evaluation of several built environment resources adjacent to an existing NRHP district. The City of Azusa proposed to construct an approximately 39-foot high, four-story parking structure, bus bays for passenger loading/unloading for layovers, and electric charging stations for patrons of the future Gold Line Foothill Extension Azusa Station. Client: Terry Hayes Associates.

**Terminal Island Historic Building Evaluations, Los Angeles County, California (2011).** Ms. Murray served as project manager, field director for the architectural history survey, and primary author of the technical report. She formally evaluated 16 Port of Los Angeles-owned properties on Terminal Island for NRHP and CRHR eligibility, as well as local level eligibility. Client: CDM; Port of Los Angeles.

**LOSSAN San Luis Rey River and Second Track Project, Oceanside, San Diego County, California (2011).** Ms. Murray served as primary author for the technical report and conducted the intensive-level cultural resources field survey. The project proposes to construct a new 0.6-mile section of double-track to connect two existing passing tracks, and replace the existing San Luis Rey River Bridge. She prepared the cultural resources technical report and evaluated the bridge for NRHP, CRHR, and local level criteria and integrity requirements. Client: HNTB Corporation.

**LADPW BOE San Pedro Plaza Park Project, Los Angeles County, California (2011).** Ms. Murray served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. She evaluated the entire park for local, CRHR, and NRHP eligibility and integrity requirements. The LADPW BOE proposed to conduct various outdoor improvements to the San Pedro Plaza Park. Client: LADPW BOE.

**Crenshaw /LAX Transit Corridor Project, Los Angeles County, California (2011).** Ms. Murray supervised architectural history survey and participated in the evaluation of over 100 built environment resources that may be affected by the Los Angeles County Metropolitan Transportation Authority's (Metro's) proposed Crenshaw/LAX Transit Corridor Project. The project is approximately 8.5 miles in length and is located within the cities of Los Angeles and Inglewood, Los Angeles County, California. The project was subsequently approved by SHPO with no comments. Client: Terry Hayes Associates, LLC; Agency: Metro.

**LOSSAN Control Point San Onofre to Control Point Pulgas Double Track Project, San Diego County, California (2011).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored the technical report. She conducted a survey and evaluation of cultural resources in support of the Los Angeles to San Diego, California (LOSSAN) Control Point (CP) San Onofre to CP Pulgas Double Track Upgrade Project. The project is located within the boundaries of the Marine Corps Base (MCB) Camp Pendleton in Northern San Diego County, on federal land that is part of a long-term lease to the rail operator. Client: HNTB Corporation.

**Half Moon Bay Airport Taxiway and Access Road Improvement Project, San Mateo County, California (2010).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored the technical report. She conducted a cultural resources survey of 21.65 acres situated on three areas within the 313-acre airport property, and evaluated airport properties for the CRHR and NRHP. Half Moon Bay Airport is located approximately 5 miles north of the City of Half Moon Bay in unincorporated San Mateo County, California. Client: Coffman Associates.

**Sunset Avenue Grade Separation Project, Riverside County, California (2010).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored

the ASR, HRER, and HPSR reports. The project involved a proposed grade separation of Sunset Avenue, which crosses the UPRR in the City of Banning, Riverside County. She conducted a 43.6-acre survey for cultural resources, and prepared environmental compliance documentation in accordance with Caltrans. Client: Kimley-Horn and Associates, Inc.; Agency: Caltrans District 8.

**Hollister Avenue Bridge Seismic Retrofit Project, Santa Barbara County, California (2010).**

Ms. Murray supervised the architectural history survey of surrounding properties. The project proposed the seismic retrofit of Union Pacific Railroad (UPRR) Bridge 51C-0018 on Hollister Avenue in an unincorporated area of Santa Barbara County, located between UPRR mile posts 362.08 and 362.41. Client: Santa Barbara County Public Works Department; Agency: Caltrans District 5.

**Nogales Grade Separation/Gale Avenue Widening/Evaluation of 938 Nogales Street; City of Industry, Los Angeles County, California (2009).**

Ms. Murray participated in the architectural history field survey of several properties and co-authored the report. The project consisted of conducting a cultural resources assessment for a proposed grade separation project that would lower Nogales Street beneath the Union Pacific Railroad tracks and widen a 0.83 mile section of Walnut Drive/Gale Avenue located in the City of Industry. Client: Terry A. Hayes Associates, LLC. Agency: Caltrans.

**Integrated Cultural Resources Management Plan Update for MCLB Barstow, San Bernardino County, California (2011-2014).**

Served as project manager for the 2014 ICRMP update of the 2011 ICRMP that she authored. The update includes survey and evaluation of two historic road segments, recordation and preparation of a conditions assessment of the Rattlesnake Rock Art site, and revision of the NRHP nomination for the site. Client: NAVFAC Southwest.

**Integrated Cultural Resources Management Plan, Naval Air Station, Lemoore, Kings County, California (2009-2012).**

Served as project manager and primary author of the Final ICRMP document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Station, Lemoore. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, Detachment Corona, Riverside County, California (2009-2011).**

Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach, Detachment Corona. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, Orange County, California (2009-2011).**

Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach. The management plan inventories known cultural resources, summarizes relevant laws

and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Air Weapons Station China Lake; Inyo, Kern, and San Bernardino Counties, California (2009-2011).** Served as co-author of the final document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Weapons Station China Lake. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

### Select Technical Reports (as lead author)

Murray, Samantha. 2015. *Historic Report for the property located at 3167 Senter Road, San Jose, California 95111, Assessor's Parcel Number (APN) 494-01-022.* Prepared for Launchpad Development and the City of San Jose.

Murray, Samantha and Salli Hosseini. 2015. *Cultural Resources Study for Tahoe Lake Elementary School Facilities Master Plan Project, Tahoe City, Placer County, California.* Prepared for the Tahoe Truckee Unified School District.

Murray, Samantha. 2015. *SDSU Open Air Theatre Renovation Historical Resources Technical Memorandum.* Prepared for SDSU.

Murray, Samantha. 2015. *Cultural Resources Study for the Mt. San Jacinto Community College District, San Jacinto Campus Master Plan Project, City of San Jacinto, Riverside County, California.* Prepared for the Mt. San Jacinto Community College District.

Murray, Samantha and Salli Hosseini. 2015. *Cultural Resources Study for the Jack in the Box Drive-Through Restaurant Project, City of Downey, Los Angeles County, California.* Prepared for the City of Downey.

Murray, Samantha. 2015. *Cultural Resources Study for the Hamilton Hospital Residential Care Facility Project City of Novato, Marin County, California.* Prepared for the City of Novato.

Murray, Samantha. 2015. *Historic Property Survey Report for the SR-86 Neckel Road Intersection Improvements and New Traffic Signal Light Project in the City and County of Imperial, California.* Prepared for the City of Imperial and Caltrans District 11.

Murray, Samantha. 2015. *Historical Resources Evaluation Report for the California Boulevard Roundabouts Project, City and County of Napa, California.* Prepared for the City of Napa and Caltrans District 4.

Murray, Samantha. 2015. *Historic Property Survey Report for the California Boulevard Roundabouts Project, City and County of Napa, California.* Prepared for the City of Napa and Caltrans District 4.

Samantha Murray, Salli Hosseini, Angela Pham, and Adam Giacinto. 2015. *Cultural/Historical Resource Technical Report: Morena Reservoir Outlet Tower Replacement Project Lake Morena Village, San Diego County, California, Services R-308078 Task Order No. 30*. Prepared for the City of San Diego.

Samantha Murray, Salli Hosseini, Adriane Dorrlor, and Brad Comeau. 2015. *Cultural/Historical Resource Technical Report: 69<sup>th</sup> and Mohawk Pump Station 5017 69<sup>th</sup> Street / 6910 Mohawk Street, San Diego, California 92115*. Prepared for the City of San Diego.

Murray, Samantha and Adam Giacinto. 2015. *Cultural Resources Technical Report for the SDSU Engineering and Interdisciplinary Sciences Building*. Prepared for SDSU.

Murray, Samantha. 2015. *Historical Resource Technical Report: San Carlos Library 7265 Jackson Drive, San Diego, California 92119*. Prepared for the City of San Diego.

Murray, Samantha. 2015. *Cultural Resources Study for the Robertson Lane Hotel and Commercial Redevelopment Project, City of West Hollywood, Los Angeles County, California*. Prepared for the City of West Hollywood.

Murray, Samantha. 2015. *Historic Resource Evaluation Report: 3877 El Camino Real Palo Alto, California 94306*. Prepared for the City of Palo Alto.

Murray, Samantha. 2015. *Addendum to Phase I Cultural Inventory for Pump Station No. 2 Power Reliability and Surge Protection Project, San Diego County, California (WBS# S-00312.02.02)*. Prepared for the City of San Diego.

Murray, Samantha. 2015. *Significance Evaluation of the Property at 8572 Cherokee Drive, City of Downey, Los Angeles County, California*. Prepared for the City of Downey.

Murray, Samantha. 2014. *Peer Review of Historic Resource Evaluations for 429-447 University Avenue and 425 University Avenue, Palo Alto, California*. Prepared for the City of Palo Alto.

Murray, Samantha. 2014. *Peer Review of the Draft Historic Resource Evaluation for 1050 Page Mill Road, Palo Alto, California*. Prepared for the City of Palo Alto.

Murray, Samantha. 2014. *Significance Evaluation of the Property at 3521 14 Mile House Road, Forest Ranch, Butte County, California*. Prepared for California State University, Chico.

Murray, Samantha, Adam Giacinto, and Justin Castells. 2014. *Cultural and Paleontological Resources Inventory for the Cove Development project, City of Chula Vista, California*. Prepared for E2 ManageTech Inc.

Murray, Samantha, Steven Treffers, and John Dietler. 2014. *Cultural Resources Survey Report for the Gaffey Pool and Bathhouse Project in San Pedro, City of Los Angeles, Los Angeles County, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.



Murray, Samantha. 2013. *Historic Property Survey Report for the Downtown Cesar Chavez Median Project, City and County of Los Angeles, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering and Caltrans District 7.

Murray, Samantha, Steven Treffers, and Shannon Carmack. 2013. *Historic Context Statement Report for Evaluation of Cold War-era Properties on Edwards Air Force Base, California*. Prepared for JT3, LLC.

Murray, Samantha, Steven Treffers, and Shannon Carmack. 2013. *Cultural Resources Survey Report for the Azusa Intermodal Parking Facility Project, City of Azusa, Los Angeles County, California*. Prepared for Terry A. Hayes Associates

Murray, Samantha, Steven Treffers, and John Dietler. 2012. *Final Cultural Resources Survey Report for the CP East Brook to CP Shell Double Track Project, San Diego County, California*. Prepared for HNTB Corporation.

Murray, Samantha and John Dietler. 2012. *Cultural Resources Survey Report for the Ford City Delivery Meter Station Project, Kern County, California*. Prepared for Mojave Pipeline Company.

Murray, Samantha, Steven Treffers, Mary Ringhoff, and Jan Ostashay. 2011. *Built Environment Evaluation Report for Properties on Terminal Island, Port of Los Angeles, City and County of Los Angeles, California*. Prepared for CDM and the Port of Los Angeles.

Murray, Samantha, Cheryle Hunt, and John Dietler. 2011. *Cultural Resources Survey Report for the South San Fernando Valley Park and Ride Project, City and County of Los Angeles, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.

Murray, Samantha, Brandi Shawn, and John Dietler. 2011. *Cultural Resources Survey Report for the San Pedro Plaza Park Project in San Pedro, City of Los Angeles, Los Angeles County, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.

Murray, Samantha and John Dietler. 2011. *Cultural Resources Survey Report for the WKN Wagner Wind Project, Palm Springs, Riverside County, California*. Prepared for the Altum Group.

Murray, Samantha, Laura Hoffman, and John Dietler. 2011. *Integrated Cultural Resources Management Plan for the Marine Corps Logistics Base, Barstow, California*. Prepared for the U.S. Department of the Navy NAVFAC SW and Marine Corps. Logistics Base Barstow.

Murray, Samantha, Robert Ramirez, and John Dietler. 2011. *Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Detachment Corona, Riverside County, California*. Prepared for the U.S. Department of the Navy NAVFAC SW.

Murray, Samantha and John Dietler. 2010. *Cultural Resources Overview and Survey Report for the Poso Creek Delivery Meter Station Project, Kern County, California*. Prepared for El Paso Corporation.

## Publications

Gross, C., Melmed, A., Murray, S., Dietler, S., and Gibson, H. 2012. *Osteological Analysis In Not Dead but Gone Before: The Archaeology of Los Angeles City Cemetery*, edited by H. Gibson and S. Dietler, AECOM Cultural Heritage Publication Number 4, San Diego.

Murray, S. 2013. *The People of Plaza Church Cemetery (1822-1844): An Osteological Analysis of Los Angeles' First Cemetery*. UMI Dissertation Publishing, ProQuest, LLC., Michigan.

## Presentations

***Historical Resources under CEQA. Prepared for the Orange County Historic Preservation Planner Working Group. Presented by Samantha Murray, Dudek. December 1, 2016.*** Ms. Murray delivered a one-hour PowerPoint presentation to the Orange County Historic Preservation Planner Working Group, which included planners from different municipalities in Orange County, regarding the treatment of historical resources under CEQA. Topics of discussion included identification of historical resources, assessing impacts, avoiding or mitigating impacts, overcoming the challenges associated with impacts to historical resources, and developing effective preservation alternatives.

***Knowing What You're Asking For: Evaluation of Historic Resources. Prepared for Lorman Education Services. Presented by Samantha Murray and Stephanie Standerfer, Dudek. September 19, 2014.*** Ms. Murray and Ms. Standerfer delivered a one-hour PowerPoint presentation to paying workshop attendees from various cities and counties in Southern California. The workshop focused on outlining the basics of historical resources under CEQA, and delved into issues/challenges frequently encountered on preservation projects.

## Relevant Training

- CEQA and Historic Preservation: A 360 Degree View, CPF, 2015
- Historic Designation and Documentation Workshop, CPF, 2012
- Historic Context Writing Workshop, CPF, 2011
- Section 106 Compliance Training, SWCA, 2010
- CEQA Basics Workshop, SWCA, 2009
- NEPA Basics Workshop, SWCA, 2008
- CEQA, NEPA, and Other Legislative Mandates Workshop, UCLA, 2008

# Kara R. Dotter, MSHP

## Senior Historic Preservation Specialist and Architectural Historian

Kara Dotter is a senior historic preservation specialist with more than 15 years experience in historic preservation and architectural conservation. Her historic preservation experience spans all elements of cultural resources management, including project management, intensive- and reconnaissance-level field investigations, architectural history studies, and historical significance evaluations in consideration of the National Register of Historic Places (NRHP), California Register of Historical Places (CRHR), and local-level designation criteria.

Ms. Dotter's background in geology informs many aspects of her architectural conservation work, including insight into the deterioration of building materials over time, which helps inform preservation strategies for various types of construction materials. She has experience with a variety of materials, in particular stone, brick, mortar, and concrete. Her materials analysis skills include petrographic analysis of stone, mortar, and concrete; paint analysis; wood species identification; and applicable American Society for Testing and Materials standards, as well as proficiency with Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDS), back-scattered electron imagery (BSE), atomic absorption spectrometry (AAS), differential thermal analysis (DTA), X-ray diffraction (XRD), and ion chromatography techniques.

Ms. Dotter exceeds the Secretary of the Interior's Professional Qualification Standards for Architectural History. She is experienced managing multidisciplinary projects in the lines of land development, state and local government, and the private sector. She has experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). She also prepared numerous Historic Architectural Survey Reports (HASRs) and Findings of Effect (FOE) reports for the California High-Speed Rail Authority.

## Project Experience

### Transportation

**Environmental Preconstruction Services for Construction Package 2 and 3, California High-Speed Rail Authority, Fresno to Bakersfield Section, California.** Served as project lead for the Built Environment component of the environmental preconstruction services. The work involved conducting cultural resources assessments for a proposed 65-mile-long segment of the Fresno to Bakersfield high-speed rail alignment as directed by the California High-Speed Rail Authority and Federal Transit Administration (FTA) in order to comply with NEPA and CEQA regulations. Ms. Dotter's contributions included architectural history field surveys; documenting and updating the CRHR-designated 7,040-acre Washington Irrigated Colony Rural Historic Landscape; completion of over 150 California Department of Parks and Recreation (DPR) forms for the evaluation of built environment resources; managing structural and vibration engineering consultants; conducting research for and producing HASRs and supplemental

### EDUCATION

Queen's University of Belfast

PhD Candidate (ABD)

University of Texas, Austin

MS, Geological Sciences, 2006

MS, Historic Preservation, 2004

University of Houston

BS, Geology, 1996

### CERTIFICATIONS

CEQA Practice Certificate (in progress)

### PROFESSIONAL AFFILIATIONS

Association for Preservation Technology

California Preservation Foundation

Construction History Society of America

Society of Architectural Historians

Findings of Effect (sFOEs); and development of Protection and Stabilization Plans and Response Plans for Unanticipated Effects and Unintended Damage.

**Environmental Compliance Services for the Caltrain Modernization (Calmod) Peninsula Corridor Electrification Project (PCEP).** Served as project lead for the Built Environment component of the environmental compliance services. The work involved cultural resources documentation in order to comply with NEPA and CEQA regulations relating to the electrification and increased capacity of the Caltrain Corridor from San Francisco's 4th and King Caltrain Station to approximately the Tamien Caltrain Station. Ms. Dotter's contributions include architectural history field surveys; managing subconsultants; conducting research for and producing documentation to HABS level III standards; and reviewing design plans and equipment placement for conformance with the Secretary of the Interior Standards for Rehabilitation.

**San Francisco International Airport (SFO) Residential Sound Insulation Program, Historic Architecture Services, As-Needed CEQA Planning Services for SFO.** Served as architectural historian and co-author of the Historical Resources Assessment Report. The work involved historical resources assessments and documentation of properties in the cities of San Bruno and Millbrae in order to comply with NEPA and CEQA regulations relating to SFO capital improvement projects. Ms. Dotter's contributions included architectural history field surveys; documenting 28 residential buildings; and completion of California Department of Parks and Recreation (DPR) forms for the evaluation of built environment resources.

## Municipal

**Santa Barbara Armory, California National Guard, Santa Barbara, Santa Barbara County, California.** Served as architectural historian and lead author of the update to state and local designations. The work involved historical resources documentation in order to comply with NEPA and CEQA regulations relating to the potential sale of the property. Ms. Dotter's contributions included updating documentation relating to the Santa Barbara Armory individual designation, as well as recording and evaluating the Santa Barbara Armory complex as a historic district for NRHP, CRHR, and local level criteria and integrity considerations; completion of DPR forms; and responding to SHPO comments.

**Normal Street DMV Facility Replacement, San Diego County, California.** Served as architectural historian and lead author of the Historical Resources Technical Report. The work involved cultural resources documentation in order to comply with NEPA and CEQA regulations relating to the proposed facilities replacement. Ms. Dotter's contributions included recording and evaluating the Normal Street DMV building for NRHP, CRHR, and local level criteria and integrity considerations, completion of DPR forms, and responding to SHPO comments.

## Development

**Village 3 HomeFed Otay Park Swap, Otay Ranch, Chula Vista, California.** Served as Cultural Resources project lead for the Constraints Analysis, as well as architectural historian and author of the Historical Resources Technical Report. The project proposed to develop approximately 100 acres of land south of the Otay River as an active recreation site. Ms. Dotter's contributions include architectural history field surveys; conducting archival research; recording and evaluating historical resources in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA.

**Santa Monica/Orange Grove Mixed-Use Development, 7811 Santa Monica Blvd., West Hollywood, California.** Served as architectural historian and co-author of the Historical Resources Technical Report, documenting existing conditions and conducting research into the history of the area and its relation to the three-parcel property in question.

**NEC Dinah Shore and Monterey Avenue Development, Palm Desert, California.** Served as architectural historian and co-author of the Cultural Resources Report, conducting research into the history of the area and its relation to the property in question.

**Montebello North and South, La Mesa, California.** Served as architectural historian and author of the Cultural Resources Technical Report, conducted research into the history of the area and its relation to the 4.16 acre subject property, documented existing conditions, and liaised with the City of La Mesa Planning Department to bring about a successful result for the client.

## Education

**Fullerton College Facilities Master Plan Program EIR, North Orange County Community College District, City of Fullerton, Orange County, California. 2017.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray co-authored and oversaw the cultural resources study. All buildings and structures on campus over 45 years old and/or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA. As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Kings Beach Elementary School Facilities Master Plan Project, Tahoe Truckee Unified School District (TTUSD), Kings Beach, California.** Served as architectural historian and lead author of the cultural resources study. Recorded and evaluated the Kings Beach Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

**Donner Trail Elementary School Modernization Project, Tahoe Truckee Unified School District (TTUSD), Kingvale, California.** Served as architectural historian and lead author of the cultural resources study. Recorded and evaluated the Kings Beach Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

## Water/Wastewater

**North County Pure Water Project, City of San Diego, California.** Ms. Dotter served as architectural historian and lead author of the Historical Resource Technical Report for the proposed pipeline route as

part of the EIR/EIS. Preparation of the report involved conducting extensive building development and archival research on historic-era structures along the proposed 56-mile-long route, development of related historic contexts, historical significance evaluations for each historic-era structure in consideration of local, state, and national designation criteria and integrity requirements, and determining appropriate mitigation measures.

**Historical Resource Evaluation Report for the San Dieguito Dam, Santa Fe irrigation District, Rancho Santa Fe, California.** Served as architectural historian and lead author of the Historical Resource Evaluation Report for the proposed handrail replacement project. Preparation of the report involved conducting extensive engineering development and archival research on dams, development of an historic context, and historical significance evaluation for the historic-era structure in consideration of local, state, and national designation criteria and integrity requirements.

## Relevant Previous Experience

### Development

**Historic Resource Nomination Report for 1445 Granada Avenue, San Diego, California.** Conducted archival research, interviews, extensive photo documentation, and forensic analysis of a 1912 Craftsman-style home in support of designation as an historic resource. Ms. Dotter also compiled supporting evidence for proposing a new San Diego Master Architect/Builder. The building was successfully nominated in May 2017.

**Historic Resource Technical Report for 1644 University Avenue, San Diego, California.** Served as architectural historian and author of the Historical Resource Technical Report. Preparation of the report involved conducting extensive building development and archival research on the commercial building, development of an historic context, and an historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements. The project proposed to build a new multi-use development with retail space, parking, and luxury condominiums. (2015)

### Education

**Rehabilitation of Lincoln Hall, University of Nevada, Reno.** Provided peer review of mortar repair specifications and fire code upgrades for the historic two-and-a-half story Lincoln Hall, constructed of brick in 1895 as a men's residence hall. Recommendations included changing the specified mortar mix to an historically appropriate mix design similar to that used originally and more compatible with existing materials. The suggested fire code upgrades originally called for infilling the intentionally designed wall ventilation space between interior and exterior wythes of brick with Portland cement-based grout, altering the breathability and functioning of the building envelop. Ms. Dotter instead recommended discreet insertion of fire blocks between the wythes at each floor level. (2015)

**Queen's University Belfast Main Building Materials Analysis, Belfast, Northern Ireland.** Collected mortar samples and conducted materials analysis to identify components and develop recommendations for repair mortars. The project also entailed mapping exterior walls for areas of deterioration affecting mortar and brick. (2010)

### Municipal

**Paint Analysis for Mohnike Adobe, San Diego County, California.** Analyzed selected paint chip samples to develop a stratigraphy of paint layers useful in identifying replacement materials and creating



an historically appropriate paint scheme for ongoing renovations to this San Diego County-owned property. (2016)

**Materials Conservation Assessment and Recommendations for Stone Quoins, Old Antrim Courthouse, Antrim, Northern Ireland.** Investigated the existing condition of heavily-painted stone quoins on the Grade A listed 1726 Italianate-style Old Antrim Courthouse, the oldest courthouse in Northern Ireland, during extensive rehabilitation of the structure into a cultural events center. The surface of the original sandstone ashlar blocks was friable due to impermeable paint layers retaining moisture within the stone. Recommendations included gentle removal by hand of existing paint layers, misting of more recalcitrant paint layers, and consolidation or replacement-in-kind of more damaged stone. (2011)

## Specialized Training

- Tips and Tools for Environmental Review: Mastering the CEQA Process for Historic Properties in the Bay Area, 2016. California Preservation Foundation (CPF).
- Section 106: An Introduction, 2015. National Preservation Institute (NPI).
- Wood Identification Workshop, 2010. Institute of Conservator-Restorers in Ireland (IPCRA).
- Crafts and Trades, 2008. APT.
- Salts in Traditional Masonry Buildings, 2008. Scottish Lime Centre, Scotland.
- Introduction to Lime, 2007. Calch Ty-Mawr, Wales.
- Introduction to Microscopical Identification of Conservation Materials, 2006. McCrone Group.

## Publications

### Selected Technical Reports

Dotter, Kara R., Samantha Murray, and Matthew DeCarlo. 2017. *Historical Resources Technical Report for the North City Project, San Diego County, California*. Prepared for the City of San Diego Public Utilities Department.

Dotter, Kara R., Sarah Corder, and Samantha Murray. 2017. *Historic Resources Evaluation for the Normal Street Department of Motor Vehicles Site, 3960 Normal Street, San Diego, California*. Prepared for the State of California Department of General Services.

Dotter, Kara R., Sarah Corder, William Burns, and Adam Giacinto. 2017. *Historical Resources Technical Report for Siskiyou Hall, Chico, California*. Prepared for California State University, Chico Campus.

Dotter, Kara R. and Adriane Dorrlor. 2017. *Historical Resources Technical Report for 1430 National Avenue*. Prepared for LLJ Ventures, LLC.

Dotter, Kara R. and Samantha Murray. 2017. *Cultural Resources Technical Report for Santa Monica/Orange Grove Mixed-Use Development, 7811 Santa Monica Boulevard*. Prepared for the City of West Hollywood.

Dotter, Kara R. 2016. *Historical Resources Evaluation Report for 7664 El Cajon Blvd., La Mesa, California*. Prepared for A.P.T.S., Inc.

Dotter, Kara R. and Samantha Murray. 2016. *Cultural Resources Study for Kings Beach Elementary School Facilities Master Plan Project, Kings Beach, Placer County, California*. Prepared for the TTUSD.

- Dotter, Kara R., Ione Stiegler, Vonn Marie May, Katie Debiase. 2016. *District Update for the Washington Irrigated Colony Rural Historic Landscape, Fresno County, California*. Prepared for the California High-Speed Rail Authority and California State Historic Preservation Officer.
- Dotter, Kara R., Ione Stiegler, Rick Tavares, and Mel Green. 2016. *Plan for Protection and Stabilization and Response Plan for Unanticipated Effects and Inadvertent Damage: Lakeside Cemetery, Hanford, California*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R., Ione Stiegler, Rick Tavares, and Mel Green. 2016. *Findings of Effect for the Fresno to Bakersfield Project Section Primary Re-examination Area for Construction Package 2-3: Addendum to the Findings of Effect*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R. and Ione Stiegler. 2016. *Historic Architectural Survey Report Addendum No. 5 (Primary Re-examination Area), Fresno to Bakersfield Project Section*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R. and Ione Stiegler. 2015. *Historic Resource Nomination Report for 1445 Granada Ave., San Diego, California*. Prepared for private client.
- Dotter, Kara R. and Ione Stiegler. 2015. *Historic Resource Technical Report for 1644 University Ave., San Diego, California*. Prepared for private client.

## Other Publications

- Dotter, K. R. 2010. "Historic Lime Mortars: Potential Effects of Local Climate on the Evolution of Binder Morphology and Composition." *Limestone in the Built Environment: Present Day Challenge for Preservation of the Past*. Geological Society of London. Special Publication 331.
- Dotter, K. R., Smith, B. J., McAlister, J., and Curran, J. 2009. "Sacrifice and Rebirth: The History of Lime Mortar in the North of Ireland." *Proceedings of the 3rd International Congress on Construction History*. Brandenburg University of Technology. May 2009.
- Dotter, K. R., Smith, B. J., McAlister, J., and Curran, J. 2008. "Effects of Weathering Processes on Conservation Mortars and the Surrounding Stone Substrate." *Proceedings of the 11<sup>th</sup> International Congress on Deterioration and Conservation of Stone*. Nicolaus Copernicus University Press. September 2008.
- Dotter, K. R. 2007. "Symbolism of Stone Use in Traditional Chinese Gardens." *STONE: Newsletter on Stone Decay*. No. 3.

## Conference Presentations

- "The Weathering of Conservation Mortars, and Implications for Historic Preservation." 2011. Presented at the Association for Preservation Technology (APT) Annual Conference. Victoria, British Columbia, Canada.
- "40 Years of Conservation Mortars: Evolution and Effects." 2008. Presented at the APT Annual Conference. Montréal, Québec, Canada.
- "Historical and Current Analysis Methodologies for the Characterization of Historic Lime Mortars." 2006. Presented at the American Institute for Conservation of Historic and Artistic Works (AIC) Annual Conference. Providence, Rhode Island.

"Characterization and Comparison of Modern and Historic Lime Mortars." 2005. Presented at the APT Annual Conference, 21–26 September 2005, Halifax, Nova Scotia, Canada.

"Air Pollution Interaction with Consolidated Stone." 2005. Joint project presented by Tye Botting at the AIC Annual Conference. Minneapolis, Minnesota.

"Early 20th Century Prison Technology." 2004. Presented at the APT Annual Conference. Galveston, Texas.

# Sarah Corder

## Architectural Historian

Sarah Corder is an architectural historian with more than 10 years' professional experience throughout the United States in the fields of architectural history and historic preservation. Prior to coming to Dudek, she owned and operated a historic preservation consulting business in Virginia. Throughout her career, Ms. Corder managed and worked on a variety of projects including National Register of Historic Places (NRHP) nominations, tax credit rehabilitation projects, Save America's Treasures projects, and numerous transportation projects. She served as a historic preservation project manager or architectural historian on all projects.

## Relevant Project Experience

### EDUCATION

Savannah College of Art and Design

MFA, Historic Preservation, 2004

Bridgewater College

BA, History, 2002

### CERTIFICATIONS

Certified Historic Preservation Consultant,  
Commonwealth of Virginia

Secretary of the Interior's Standards in  
Architectural History and History, exceeds  
requirements

### PROFESSIONAL AFFILIATIONS

National Trust for Historic Preservation

Los Angeles Conservancy

Society for Architectural Historians

**As-needed CEQA Planning Services, SFO, San Francisco, California.** Ms. Corder prepared a historical resources assessment report that included 28 properties in consideration of national, state and local criteria and integrity requirements. The project also included a survey, archival research, records search and preparation of DPR forms for each property.

**Castellija School Project Focused Environmental Impact Report (EIR), Palo Alto, California.** Ms. Corder prepared a cultural resource study that included 11 historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.

**CSU, Chico, Siskiyou Hall, Chico, California.** Ms. Corder prepared a historical resources technical report for Siskiyou Hall located on the CSU, Chico campus. The project also included a survey, archival research, and a records search.

**Environmental Services Retainer, Southern California.** Ms. Corder assisted with the preparation of a historical resources technical report for a DMV building in San Diego, California. Her contributions included archival research and preparation of historic context sections.

**Fullerton College Master Plan Program Environmental Impact Report (EIR), Fullerton, California.** Ms. Corder prepared a cultural resource study that included 25 historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.

**Olivewood Village Historic Resources Assessment, Pasadena, California.** Ms. Corder prepared a historical resources technical report for an institutional building in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.

**Owlwood, Los Angeles, California.** Ms. Corder prepared a cultural resources study for a residential building in consideration of national, state, and local criteria and integrity requirements. The study also included archival research, and a records search.

**Pacific Freeway Center, Fontana, California.** Ms. Corder prepared a cultural resources survey report for a large industrial complex in consideration of national, state, and local criteria and integrity requirements. The study also included preparation of DPR form, archival research, survey, and a records search.

**University Villages, Merced Student Housing Project, Merced, California.** Ms. Corder prepared a cultural resources letter report for a residential agricultural complex in consideration of national, state, and local criteria and integrity requirements. The study also included preparation of a DPR form, archival research, survey, and a records search.

#### Relevant Previous Experience

#### Development

**East Los Angeles College Environmental Impact Report (EIR), South Gate, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings, and developed mitigation measures.

**Wetlands Pocket Park, Los Angeles, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

#### Transportation

**Crenshaw/Los Angeles International Airport (LAX) Transit Corridor, Cities of Los Angeles and Inglewood, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

**Alameda Corridor–East Construction Authority (ACE) San Gabriel Trench Grade Separation, Los Angeles County, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

#### NRHP Evaluations and Nominations

**Old Town Historic District, Harrisonburg, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 450 historic buildings and structures, prepared presentations for public meetings, performed extensive primary and secondary source research, and managed survey teams.

**Whitesel Brothers, Harrisonburg, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded historic building and prepared an NRHP nomination.

**Ramsay, Greenwood, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 17 historic buildings and structures and prepared an NRHP nomination.

**George Chrisman House, Linville, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded historic buildings and structures and prepared an NRHP nomination.

**David and Catherine Driver Farm, Timberville, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 823 acres of farming complex including seven historic buildings and five structures and prepared an NRHP nomination.

## Professional Experience

**SWCA Environmental Consultants, Pasadena, California.** Served as an architectural historian and a project coordinator for multiple programs. Responsibilities included historic resource surveys, primary and secondary research, and quality assurance (QA)/quality control (QC) and senior level oversight for hundreds of California Department of Parks and Recreation forms. (2009–2014)

**Sabe Preservation Consulting, Harrisonburg, Virginia.** Owned a historic preservation consulting services firm. Responsibilities included NRHP nomination preparation and inventory; rehabilitation project management; Section 106 review; Main Street planning and development; building condition assessment and Historic American Buildings Survey (HABS) documentation; management of all financial documents; client interaction; leading public meetings and workshops; and management of employees, interns and subcontractors. (2004–2009)

**Owens-Thomas House Museum, Savannah, Georgia.** Served as preservation project manager for a nineteenth century plaster conservation project. Responsibilities included plaster conservation, management and training of staff and student interns, photographic documentation, presentation of project information to the public and museum staff, preparation of weekly reports, and safety compliance. (2005–2006)



# **APPENDIX B**

## *NOP Comment Letters*



## APPENDIX B

### NOP Comment Letters

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The following tables summarizes the comments received during the Notice of Preparation (NOP) public scoping period, from April 9, 2018 to May 8, 2018. Following this table are the copies of the comment letters received.

#### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
<i>State Agencies</i>			
Native American Heritage Commission	4/19/2018	<p>The commenter notes that CEQA was amended significantly in 2014 to include a separate category of cultural resources, "tribal cultural resources," and provides that a project that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. Assembly Bill (AB) 52 applies to any project for which a notice of preparation is filed after July 1, 2015. AB 52 has tribal consultation requirements and certain timing requirements for notification that are outlined in the letter.</p> <p>The commenter requested an appropriate records search to determine known traditional cultural resources, and preparation of an archaeological inventory survey if required. The commenter provided a list of appropriate Native American contacts for consultation concerning the project site. According to the commenter, mitigation should be included in the EIR to identify and evaluate accidentally discovered archaeological resources pursuant to California Health and Safety Code Section 7050.5 and CEQA Section 15064.5(f).</p>	Section 4.9, Tribal Cultural Resources
California Department of Transportation (Caltrans)	5/1/2018	According to the commenter, the TIA needs to be submitted to Caltrans for review and comment. If the project will impact state right-of-way, the District needs to follow Caltrans standards for preparation of traffic impact studies. Because of an existing Class II bicycle lane on Berkeley Avenue, Caltrans urges appropriate measures to ensure the safety of bicyclists and pedestrians.	Section 4.8, Traffic and Circulation
Department of Toxic Substances Control (DTSC)	5/3/2018	The commenter recommends the identification of current and historic uses at the project site that may have resulted in the release of hazardous wastes/substances. If there are any recognized environmental conditions in the project area, then proper investigation, sampling, and remedial actions overseen by the appropriate regulatory agencies should be conducted prior to the new development or any construction. If project plans include discharging wastewater to a storm drain, a National Pollutant Discharge Elimination System permit from the	Section 4.4, Hazards and Hazardous Materials

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		<p>Regional Water Quality Control Board may be required. If planned activities include building modifications/demolitions, lead-based paints or products, mercury, and asbestos containing materials should be investigated and mitigated/disposed of in accordance with all applicable and relevant laws and regulations. In addition, evaluate whether polychlorinated biphenyl (PCB) containing materials are present in on-site buildings, and address as necessary to protect human health and the environment. If the site was used for agricultural or related activities, residual pesticides may be present in on-site soil. DTSC recommends investigation and mitigation, as necessary, to address potential impact to human health and environment from residual pesticides. DTSC recommends evaluation, proper investigation and mitigation, if necessary, of on-site areas with current or historic PCB-containing transformers. Regarding underground storage tanks (USTs) associated with the boiler plant, the regulatory agencies that approved the closure of the contaminated site cleanups/UST sites should be identified. DTSC recommends soil gas sampling and vapor intrusion risk evaluation on sites with releases of volatile organic compounds (VOCs) or total petroleum hydrocarbons (TPH). DTSC is unable to evaluate whether vapor sampling and/or potential vapor intrusion risk was adequately addressed due to the lack of relevant detailed information in the Initial Study. DTSC recommends soil gas sampling after to confirm no residual VOC/TPH contamination remains on site and/or risk is acceptable based on applicable and relevant state guidelines. If soil contamination is suspected or observed on the project site, then excavated soil should be sampled prior to export/disposal. If the soil is contaminated, it should be disposed of properly in accordance with all applicable and relevant laws and regulations. In addition, if the project involves importing soil to backfill the excavated areas, proper evaluation and/or sampling should be conducted to make sure that the imported soil is free of contamination. If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the EIR should identify how any required investigation and/or remediation will be conducted and the appropriate government agency to provide regulatory oversight.</p>	

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Regional Agencies			
South Coast Air Quality Management District	5/1/2018	The commenter recommends that the CEQA Air Quality Handbook (1993) be used for all air quality analysis and California Emissions Estimator Model land use emissions software be used to estimate pollutant emissions from typical land use developments. Air quality impacts from project operations and construction should be calculated. The South Coast Air Quality Management District has developed regional and localized significance thresholds for criteria pollutants that should be compared to estimated proposed project emissions. A mobile source health risk assessment should be performed in the event that the proposed project generates or attracts vehicular trips. The California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective is recommended as guidance for siting incompatible land uses. Several resources are recommended to assist in the drafting of mitigation measures in the event that the project generates significant adverse air quality impacts. The commenter states that CEQA requires that all feasible mitigation measures that go beyond what is required by the law be used during project construction and operation to minimize or eliminate these impacts. Further, the letter notes that any impacts resulting from mitigation measures must be discussed pursuant to CEQA Guidelines Section 15126.4(a)(1)(D).	Section 4.2, Air Quality Section 4.3, Greenhouse Gas Emissions
Local Agencies			
City of Fullerton	5/8/2018	<p>The City is pleased that the Initial Study acknowledges the potential for significant impacts. The City asks that the EIR include effective and enforceable mitigation measures that will protect the surrounding residential areas from light, noise, and traffic intrusion.</p> <p>The commenter requests that if there is a project objective to increase opportunities for field rentals, this should be identified.</p> <p>The City requests a discussion of any changes in programming that are anticipated with the improvements to the field.</p> <p>In terms of lighting, the City requests that the elevation of light fixtures relative to the neighborhoods north of campus be addressed, as well as the type of lighting fixtures, the effectiveness of proposed mitigation measures, and enforcement of lighting curfews.</p>	Chapter 3, Project Description Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		<p>The City requests that the EIR address how the College will control noise from outside rental groups' sound systems and address the types of sound systems that might be used by these outside groups.</p> <p>According to the commenter, the traffic analysis needs to address bypass traffic through local neighborhoods, the offset condition of Parking Lot 6 driveway and Brookdale Place on Berkeley Avenue, and a worst-case situation where Fullerton Union High School and Fullerton College host games or activities simultaneously. The City also notes that any work in the public street right-of-way will require approval of the Director of Public Works, and that permits need to be obtained from the City's Public Works Department.</p> <p>The City requests that the EIR evaluate impacts to public infrastructure, using anticipated quantities of discharge into storm drains, sewers, and anticipated water usage.</p> <p>For alternatives, the commenter recommends that the EIR look at a No Project, a Reduced Project, and an Alternative Location, including building a new stadium at Cypress College.</p>	
<b>Scoping Meeting Comment Cards</b>			
Muriel Bergman	5/8/2018	Commenter is opposed, due to light and noise pollution, traffic, and parking problems.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Dan Chlebowski	5/1/2018	Commenter supports building the stadium; "100 years in the making."	N/A
Mike Clay	5/1/2018	Commenter fully supports the project, citing the need to upgrade the field for future generations and stating that this will improve the community college and the community.	N/A
Amy Dickinson	5/8/2018	Commenter states that the plans for this stadium do not match the perceived need, and the project will serve an insignificant population of the college campus. Commenter characterizes the proposed project as a "feel good" project to celebrate Coach Sherbeck and the victorious football team, which does not compete with the injurious nature to their home and their neighborhood in terms of light pollution, noise pollution, and traffic.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Yolanda Duron	5/1/2018	Commenter states that it is a great idea, and will build more community involvement and will improve the student experience. This is for all students.	N/A



## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Jeff Holt	5/8/2018	Commenter states that the proposed improvements will be a visual and sonic assault on the surrounding community.	Section 4.1, Aesthetics Section 4.5, Noise
Mary Beth Holt	5/8/2018	Commenter is opposed due to parking strain, increased glare from lights, and noise from the audio system, which the commenter states will be a detriment to the community.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Loretta Hooghkirk	5/8/2018	Commenter's concerns include how tall the light posts will be and how they will affect her view; e.g., will there be lights shining in her yard? How loud will the PA system be? Will there be increased traffic and overspill parking on her street? How late will events be allowed and how late will the lights be on?	Chapter 3, Project Description Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Brice Hunt	5/1/2018	Commenter is opposed to stadium because of speakers and lighting.	Section 4.1, Aesthetics Section 4.5, Noise
Sandee Hunt	5/1/2018	Commenter is opposed to stadium because of traffic, noise, and outside rentals.	Section 4.8, Traffic and Circulation Section 4.5, Noise
Ellen Lentz	5/8/2018	Commenter stresses the need to consider the community. According to the commenter, they already suffer, and this stadium would further magnify noise, traffic and unsafe drivers, trash, and light pollution.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Bill Miller	5/1/2018	Commenter states that they are already dealing with loud noise at early hours, trash, drug deals, and lewd behavior in cars, and says the project will bring more of the same.	Section 4.5, Noise <b>Note:</b> Lewd behavior is not a topic assessed under CEQA.
Ursula Oleksyn	5/1/2018	Commenter cites negative impact on quality of life with parking, noise, air quality. Commenter notes that there is already a stadium in the area.	Section 4.8, Traffic and Circulation Section 4.5, Noise Section 4.2, Air Quality
Marlon Rizo	5/1/2018	Commenter states that Fullerton College should lower tuition costs before building a stadium.	N/A
Chris Ryan	5/1/2018	Commenter is opposed to stadium because of noise pollution, light pollution, traffic congestion, and loss in property value.	Section 4.5, Noise Section 4.1, Aesthetics Section 4.8, Traffic and Circulation
Susan Ryan	5/1/2018	Commenter is opposed to spending the money on the Sherbeck Field improvements because of noise, trash, and traffic congestion. States that the project will also decrease property values. Suggests the use of funds to increase academic opportunities.	Section 4.5, Noise Section 4.8, Traffic and Circulation

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
			<b>Note:</b> Littering and property values are not topics assessed under CEQA.
Jo Sand	5/8/2018	Commenter is opposed due to traffic, noise, lower property values. Suggests the use of the other stadiums within a mile or less (Fullerton Union High School or California State University, Fullerton (CSUF)) for Fullerton College football.	Section 4.5, Noise Section 4.8, Traffic and Circulation <b>Note:</b> Property values are not assessed under CEQA.
Laurice Singer	5/1/2018	Commenter is opposed to project. Suggests use of high school stadium. States that project would be a waste of taxpayer money, and cites noise, traffic, lighting, and trash issues.	Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.1, Aesthetics <b>Note:</b> Littering is not a topic assessed under CEQA.
Robert Singer	5/8/2018	Commenter states that the following significant negative impacts to the surrounding neighborhoods are likely: increases in noise and night lighting; drugs, alcohol, undesirable behavior; loss of privacy; and parking and street congestion. Suggests sharing the artificial turf stadium at Fullerton Union High School or other venues.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives <b>Note:</b> Undesirable behavior and privacy are not topics assessed under CEQA.
Jon St. Amant	5/8/2018	Commenter states that noise is a big concern and suggests sound-absorbing walls, suggesting that this could be constructed as a buffer between the stadium and surrounding community.	Section 4.5, Noise
Desi St. Amant	5/8/2018	Commenter is concerned about increased traffic. States that the sound study was conducted on a day when few students were in school with no traffic, skewing the study results. Notes increased trash and light pollution as an issue. States that the site was rejected in 1973 because it was primarily residential and asks what has changed about the location.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation.
Tenney	5/7/18	Commenter is okay with the plans.	N/A
Shirley Wooldridge	5/8/2018	Commenter is opposed due to traffic congestion, lights, noise, and litter.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Jan Youngman	5/8/2018	Commenter states that there is no need for a stadium at Fullerton College because there is one at the high school. States intention to work to vote all Trustees out of office regarding this issue.	Chapter 6, Alternatives

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Individuals			
Amy Alspaugh	5/4/2018	Commenter's concerns and objections include increased traffic, noise pollution, parking problems, traffic congestion, vendors, trash, strain on Fullerton Police, and violations of local residents' and homeowners' property rights with loitering, vandalism, loss of privacy, noise and lighting, and unwelcome visitors to the neighborhood.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.6, Public Services Section 4.8, Traffic and Circulation <b>Note:</b> Littering, loss of privacy, and unwelcome visitors are not topics assessed under CEQA.
Robert L. Ashlock	4/18/2018	Commenter is opposed due to traffic and parking issues caused by the College. States that the use of the field at night will further extend the traffic, parking, and noise into the neighborhood.	Section 4.5, Noise Section 4.8, Traffic and Circulation
Ken Bane	5/8/2018	Commenter does not agree with Land Use and Planning conclusions in the Initial Study. Thinks mitigation such as an alternative location, reduced project, putting a dome over the project, lowering the project below grade, and establishing a formal communication channel to issue complaints should be considered. Commenter recommends that noise mitigation measures include innovative streaming to individual smart devices, having all bleachers face away from homes.	Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Richard Bartulski	4/16/2018	Commenter is opposed.	N/A
Randolph Baxter	4/20/2018	Commenter states that the project would increase traffic, air quality, greenhouse gas emissions, and noise in the area.	Section 4.2, Air Quality Section 4.3, Greenhouse Gas Emissions Section 4.8, Traffic and Circulation
Cyndi Bemis	5/1/2018	Commenter raises concerns about noise; parking in neighborhoods, which causes safety concerns; sleep disruption; trash on streets; vandalism; decrease in home values; and cost of project when other stadiums are available for use.	Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.6, Public Services Chapter 6, Alternatives <b>Note:</b> Littering and home values are not topics assessed under CEQA.
William H. Chambers	5/3/2018	Commenter is 100% in support, stating that it is long overdue. Commenter was head Fullerton College Athletic Trainer for 38 years, and states that taking athletes off campus for games is difficult. It is expensive for transportation and rent. Notes that their teams were always third in line at the Fullerton Union	Chapter 6, Alternatives

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		High School stadium, and at CSUF, they were treated as outsiders. States that now the students are bused to Yorba Linda High School. States that Sherbeck Field is a classroom for football and track athletes as well as for physical activities.	
Martin and Maria Chavez	5/8/2018	Commenters are opposed due to noise, light pollution, generation of trash and vandalism, traffic, and crowd control. Suggest use of alternatives already in place, such as CSUF and Fullerton Union High School stadium.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.6, Public Services Chapter 6, Alternatives
Terrence and Mary Collier	5/2/2018	Commenters are opposed to the project due to noise, excess traffic, light pollution, generation of trash and vandalism, and crowd control. Suggest that the District use the stadium at Fullerton Union High School or Titan Stadium at CSUF.	Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.1, Aesthetics Section 4.6, Public Services
John E. Collins	4/23/2018	Commenter asks whether another stadium is necessary when the high school has one that can be used. States that neighbors are opposed due to traffic, parking, light, and noise.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Wayne and Alice Collins	4/16/2018	Commenters are opposed. They have a view lot and there would be an impact on them.	N/A
Fred Crissinger III	5/4/2018	Commenter recommends building the stadium, then working out issues and compromises. Thinks the major issue has already been worked out: lights out by 10:00 p.m. States that Fullerton College would benefit, City of Fullerton would benefit, and neighboring businesses would benefit. Wonders why so few can raise a voice, all in protest over a few Saturdays, because they might be inconvenienced. Restates that it should be built.	N/A
Anna Dalin	5/8/2018	Commenter is opposed due to lights, noise, decline in home values, trash, parking, and traffic safety. Suggests use of the stadium at Fullerton Union High School.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives <b>Note:</b> Property values are not assessed under CEQA.
Wayne Dalin	5/8/2018	Commenter raises need to address parking overflow into neighborhoods. Asks if there is a mechanism to monitor parking in neighborhoods after the stadium is built. States that trash is a problem and that light pollution will be a problem. Commenter states that he	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		contacted Musco and they said the stadium at Chapman College was representative of the technology. Commenter found there was still a lot of glare there, and states that a monitoring body needs to be put in place to evaluate any light pollution once the lights are up. States that noise pollution is probably the biggest factor. Also very concerned about rentals to outside organizations where there is no control over noise. Concerned about ground vibration. Recommends a contractual agreement with residents limiting rental use. States that a shared use agreement with Fullerton Joint Union High School District (FJUHS) is the best way to mitigate noise at games. Recommends use of adjustable goal posts and repainting hash lines. States the need for a body that will receive noise complaints and do something about them.	Chapter 6, Alternatives
Ruth Davies	4/21/2018	Commenter is opposed because of increased traffic, greenhouse gas emissions, noise, light pollution, foot traffic, littering, and loss of valuable parking spaces.	Section 4.8, Traffic and Circulation  Section 4.3. Greenhouse Gas Emissions  Section 4.5, Noise  Section 4.1, Aesthetics
Ronald Dymek	5/3/2018	Commenter is opposed due to the increased noise, lighting, traffic congestion, pollution, and trash the project would create. Notes that events at the stadium will last past the 7 p.m. parking permit restriction for the neighborhood, and that noise pollution from the softball field is unbearable.	Section 4.5, Noise  Section 4.1, Aesthetics  Section 4.8, Traffic and Circulation  <b>Note:</b> Trash left behind by students on site and in the neighborhoods, while undesirable, is not an environmental impact assessed under CEQA. The CEQA questions regarding solid waste have to do with whether there is a landfill with sufficient capacity to serve the project and whether the proposed project would comply with federal, state, and local statutes and regulations related to solid waste. The project would comply with these regulations, which do not pertain to the issue of littering.

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Shaun Dymek	5/3/2018	Commenter is opposed due to safety, noise, property value decline, and future impacts. Expresses doubt that future administrations and chancellors will keep promises.	Section 4.5, Noise
Todd and Petra Farquhar	5/8/2018	Commenters state that they already have two large stadiums within 5 minutes of their house and can't imagine why there is a need for another. They understood the costs for the improvements at the high school stadium were justified in part by the benefit it would provide to sharing it with Fullerton College. State that the project would bring more noise, traffic congestion, trash, vandalism, and bright lights, and would increase the need for police patrols as well. Suggest the use of the Fullerton Union High School stadium and saving the money for something that truly benefits the community.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Mary Francis Gable	5/8/2018	<p>Commenter expresses concerns about the Sherbeck Field improvements project. States that the project should be rejected because in 1973, Fullerton Mayor Robert Root requested a study to be done by the Chamber of Commerce to find a location for a city stadium and this exact location was rejected because the location is primarily residential; traffic and parking is historically a problem there and access is poor.</p> <p>Lists a number of items that need to be considered: the project is not a classroom and would be subject to approval by the City of Fullerton. Suggests use of the Fullerton Union High School Stadium for graduation because it has 6,500 seats, and states that the seating capacity of this project is not enough.</p> <p>Concerned about lighting, suggesting an alternative that looks at replacing 60-foot lighting previously on the field. Suggests limiting the size of the project. States that lights will negatively impact birds. Cites noise as a significant concern to the neighborhood. Requests a new traffic study. States that a stadium is a public nuisance that will affect home property values. Wants the following alternatives considered: alternative location, shared use agreement with FJUHS, and reduced project.</p>	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Gary	5/2/2018	Commenter states that before stadium is complete, these things should be done: (1) parking structure; (2) no street parking on Berkeley during any event; (3) safety first (too many students cross Berkeley to park their cars and someone is going to get hit by a car); (4) have enough parking on campus and don't sell parking pass unless there is	N/A



## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		room or spaces available; (5) school should pick up all trash on a daily basis, don't leave it to the City; and (6) no neighborhood parking at any time.	
Kathleen Goodno	5/4/2018	Commenter objects to the project and demands it be denied. States that better scheduling should be considered and that the college has more than adequate sports facilities. States that the project would overburden the surrounding community. Cites sound pollution, light pollution, traffic congestion, and trash concerns. States that parking will encroach on city streets and cause safety hazards. States that there are numerous sports facilities nearby that can be used.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Jonathan Gottlieb	4/30/2018	Commenter is opposed. Has concerns about trash; noise—car noise, car alarms, street racing, and from fans at games; vandalism; drunkenness; illegal parking; lighting at night; traffic congestion; lewd conduct; illegal or unlicensed street vendors; increased overtime for Fullerton Police; and outside rentals 7 days/nights per week from 6 a.m. to 10 p.m. Suggests use of Fullerton Union High School's stadium or Titan Stadium at CSUF.	Section 4.5, Noise Section 4.1, Aesthetics Section 4.8, Traffic and Circulation Section 4.6, Public Services Chapter 6, Alternatives <b>Note:</b> Littering and lewd conduct are not topics addressed under CEQA.
Rob Grantham	5/1/2018	Commenter cites light and sound pollution concerns. Suggests use of the high school stadium. States that parking is a great concern to the neighborhood. Recommends considering a joint use agreement with Fullerton Union High School.	Section 4.1, Aesthetics Section 4.5, Noise Chapter 6, Alternatives
Robert and Susan Harmston	4/28/2018	Commenters state that there is no need for another stadium in the neighborhood, and it would bring more traffic, congestion, loitering, and trash. Suggest using the one next door or the one at CSUF, stating that this would save Fullerton College and the City having to hire more police officers. Also raise concerns about noise and lighting.	Section 4.8, Traffic and Circulation Chapter 6, Alternatives Section 4.6, Public Services Section 4.5, Noise Section 4.1, Aesthetics
Jonathan Heffernan	5/4/2018	Commenter is opposed; cites trash and traffic impacts.	Section 4.8, Traffic and Circulation <b>Note:</b> Trash left behind by students on site and in the neighborhoods, while undesirable, is not an environmental impact assessed under CEQA. The CEQA questions regarding solid waste have to do with whether there is a landfill with sufficient capacity

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
			to serve the project and whether the proposed project would comply with federal, state, and local statutes and regulations related to solid waste. The project would comply with these regulations, which does not pertain to the issue of littering or how trash gets to the city streets.
Judith Hirou	4/16/2018	Commenter is opposed; cites noise, lighting. Suggests use of two other stadiums nearby.	Section 4.5, Noise Section 4.1, Aesthetics Chapter 6, Alternatives
E. Kinny	4/13/2018	Commenter is opposed to the project.	N/A
Ellen Lentz	5/4/2018	Commenter is opposed to the project. Issues: noise would be intolerable, lights are already bright, traffic is already unbearable, and home values would plunge.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Fred Lentz	5/2/2018	Commenter is opposed to the project. Issues cited: noise; traffic; trash; and careless, dangerous driving. Commenter notes that the home side of the field is facing the neighborhood, and claims that renting out the field is the main reason for building it.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
David and Reba Lewis	4/9/2018 and 4/30/2018	Commenters are concerned about traffic, noise, and unsavory individuals. Commenters moved here in 1971 and believe the proposed project threatens their peace and safety. Commenters are concerned about trash, car noise, car alarms, noise from stadium, vandalism, drunkenness, lighting, traffic congestion, lewd conduct, illegal or unlicensed street vendors, increased overtime for Fullerton Police, and outside rentals 7 days/nights per week from 6 a.m. to 10 p.m.	Section 4.8, Traffic and Circulation Section 4.5, Noise Section 4.6, Public Services Section 4.1, Aesthetics <b>Note:</b> Littering, lewd conduct, and illegal and unlicensed street vendors are not topics assessed under CEQA.
Robbe Lindsay	5/4/2018	Commenter calls Sherbeck Field "hallowed ground" and urges "Build it now."	N/A
Laura Gallagher Lopez	4/30/2018	Commenter is opposed. Feels the field is redundant. Thinks renting out the field for profit is asking too much of the neighborhood. Notes that morning weekday traffic is already so bad from Fullerton College students/staff that on many weekday mornings, it is backed up on Lemon, north of Berkeley, toward the crest of the hill at Hillcrest Park, which makes it very difficult to get out of the commenter's neighborhood at Hillcrest Drive. Commenter requested a "do not block" sign on Lemon at Hillcrest Drive from the City of Fullerton,	Chapter 6, Alternatives Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		and it still gets blocked. States that when making a left turn onto Lemon from Hillcrest Drive, there is zero visibility in either direction and it is very dangerous, as drivers have to inch out until they're in the lane before they can see the traffic. States that this situation needs to be remedied and anything that adds to the already bad traffic situation (be it construction related or additional traffic from attendees) is of major concern from a safety and quality of life standpoint. Also concerned about light pollution and additional noise.	
Steven and Patricia Lowry	4/25/2018	Commenters are opposed. Note that Fullerton Union High School's stadium was just upgraded. Note noise as a big concern, along with light intensity.	Section 4.5, Noise Section 4.1, Aesthetics Chapter 6, Alternatives
Tanya McCrory	5/8/2018	Commenter is opposed to the current project with 4,417 seats, which exceeds the number of spectators and still falls short of what is needed for graduation. States that only 1,600 seats are needed for most events. Suggests renting the PA system for football games and commencement only. Wants a binding contract that the field won't be rented out. Would support alternate venues like Fullerton Union High School and CSUF. Would also support reduced project of 1,600 seats with no PA system and no new renters.	Chapter 6, Alternatives
William and Elaine Miller	5/6/2018	Commenters are opposed, citing parking, trash, noise, and pedestrian problems with current use of athletic facilities by school and outside entities. Further, the commenters present the following objections: the reasons for needing the project are invalid, because Fullerton College athletic programs have been successful with current facilities; viable alternatives exist nearby; physical education classes have been on the schedule for decades making use of existing facilities; property values will decline; stadium rental to outside entities and construction of the stadium using money from taxpayers who oppose the project.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Kelsey Mori	5/2/2018	Commenter is opposed. Suggests use of Fullerton Union High School's stadium. Issues: lights, loudspeakers, noise and trash, vandalism, security, and more traffic. Recommends using Fullerton Union High School or CSUF's stadium instead of building a third, unnecessary, stadium.	Chapter 6, Alternatives Section 4.1, Aesthetics Section 4.5, Noise Section 4.6, Public Services Section 4.8, Traffic and Circulation
Sherrie Mori	5/2/2018	Same comment as Kelsey Mori.	Same as above.

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Suzanne Muhaidly	5/6/2018	Commenter is opposed due to noise, light pollution, traffic congestion, trash, and proximity of the project to a residential area.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.6, Public Services Section 4.8, Traffic and Circulation
Anne S. Murphy	4/11/2018	Commenter opposes the Sherbeck Field improvements. Concerns include trash generation, noise, vandalism, drunkenness, illegal parking, parking for profit, lighting, traffic, lewd conduct, illegal or unlicensed street vendors, animal defecation, and increased overtime for Fullerton Police Department. Believes that the consequences of a stadium as proposed would reduce the values of properties within 1 mile. Urges use of newly renovated Fullerton Union High School stadium.	Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.1, Aesthetics Section 4.6, Public Services Chapter 6, Alternatives <b>Note:</b> Parking for profit, littering, lewd conduct, illegal or unlicensed street vendors, animal defecation, and impacts to property values are not topics assessed under CEQA.
Thomas Nelson	4/23/2018	Commenter is concerned about noise levels, lighting, bleacher size, and press box. Thinks various elements of the project need to be scaled down.	Section 4.5, Noise Section 4.1, Aesthetics Chapter 6, Alternatives
Damion Planchon (a.k.a. Damion Lloyd)	5/8/2018	Commenter is opposed. Notes that there is another viable stadium alternative 1,000 feet away. Has comments about seating, light pollution, safety, noise, press box, lewd conduct and trash, student demand, and funding. States that building a smaller project with 1,600 to 2,000 seats with a strict field use policy could help alleviate most of the neighbor concerns.	Chapter 6, Alternatives Chapter 3, Project Description Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Laura Richard-Barasch	5/6/2018	Commenter is concerned about the impact to the surrounding neighborhood of increased traffic, light pollution, sound pollution, and safety (impacts).	Section 4.8, Traffic and Circulation Section 4.1, Aesthetics Section 4.5, Noise Section 4.6, Public Services
Christopher Ryan	5/7/2018	Commenter is concerned about noise and light pollution, traffic congestion, and a decline in property values.	Section 4.5, Noise Section 4.1, Aesthetics Chapter 6, Alternatives <b>Note:</b> Property values are not assessed under CEQA.

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
Frankie Smith	5/10/2018	Commenter is opposed due to traffic, reduced property values, crime, and traffic accidents.	Section 4.8, Traffic and Circulation Section 4.6, Public Services <b>Note:</b> Property values are not assessed under CEQA.
Jonathan St. Amant	5/8/2018	Commenter is concerned about significant negative impacts on nighttime lighting, traffic and parking, noise, littering, and reduction of home values.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Section 4.6, Public Services <b>Note:</b> Property values and littering are not assessed under CEQA.
George Stephens	4/17/2018	Commenter plans to attend the scoping meeting.	N/A
George Stephens	5/4/2018	Commenter is concerned about the adverse effects of traffic, noise, and unwanted lighting, which will depreciate property values.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Christina Tsai	5/8/2018	Commenter is opposed due to noise, excess traffic, light pollution and negative effects of LEDs, generation of trash, vandalism, crime, lewd conduct, crowd control, and illegal and unlicensed street vendors.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation
Ben Vega	5/4/2018	Commenter notes that Fullerton Union High School didn't serve well as an alternative location. States that football and women's sports will benefit from the proposed project too. Notes need to consider technological solutions and improvements, such as triple-paned and tinted windows for residents. Suggests that with these adjustments, project might be satisfactory to the residents.	Chapter 6, Alternatives
Larry and Judy Walker	4/21/2018	Commenters are opposed. State that Fullerton College should use the high school stadium and turn the athletic fields into parking lots.	Chapter 6, Alternatives
Gary Williams	4/10/2018	Commenter is opposed, citing parking infiltration into neighborhoods, dangerous traffic, jaywalking by students, trash, unnatural lights, and noise. Suggests use of the existing stadium at Fullerton Union High School and CSUF.	Section 4.8, Traffic and Circulation Section 4.1, Aesthetics Section 4.5, Noise Chapter 6, Alternatives
Russell Williams	5/10/2018	Commenter is opposed due to excess traffic, unlicensed vendors, crowd control, loitering, drunkenness, vandalism, illegal parking, and tax consequences for residents who would underwrite	Section 4.8, Traffic and Circulation Section 4.1, Aesthetics

## APPENDIX B (Continued)

### Summary of Comments Received in Response to the NOP

Commenting Agency or Property Owner	Date	Summary of Comments	Chapter/Section Where Comment Is Addressed
		the increased impact to City services. Notes that there are alternatives, like Fullerton Union High School and Titan Stadium at CSUF.	Section 4.5, Noise Chapter 6, Alternatives <b>Note:</b> Unlicensed vendors, loitering, drunkenness, and the tax consequences are not issues assessed under CEQA.
John Wolfe	4/13/2018	Commenter states that one stadium shared between the two schools has worked well for many years. His concern is fiscal, not environmental; suggests using the money for a new parking structure instead of the stadium.	N/A
<i>Late Letters</i>			
Kevin and Karen Arthur	5/9/2018	Commenters are concerned with the noise from the proposed speakers and attendees, light, trash, and traffic. Commenters also suggest using the Fullerton Union High School stadium instead of using more taxpayer monies for the proposed improvements.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation Chapter 6, Alternatives
Samuel J. Castellano	5/9/2018	Commenter addresses concerns with noise, traffic, light, lewd conduct, and crowd control issues. Commenter is concerned with the potential damage inflicted to property values as a result of the proposed project and rising student population.	Section 4.1, Aesthetics Section 4.5, Noise Section 4.8, Traffic and Circulation

NOP = notice of preparation.



Amy Alspaugh  
505 Jacaranda Place  
Fullerton, California 92832  
(714) 721-0913  
[ajalspaugh@gmail.com](mailto:ajalspaugh@gmail.com)

May 4, 2018

Richard Williams  
District Director, Facilities Planning and Construction  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, California 92801-1819

RE: Fullerton College Sherbeck Improvement Project

Dear Mr. Williams:

I am writing in response to your letter of April 9<sup>th</sup> concerning the Fullerton College Sherbeck Improvement Project. I did in fact attend the scope meeting last Tuesday evening, but unfortunately could not stay for the duration. I did however watch the initial presentation, and it reaffirmed the concerns I already had.

As a long time Fullerton resident, homeowner, and alumni of Fullerton College, my concerns are primarily concerning the proximity of the enhancements that are being planned and the negative impact on the general area, particularly residents and homeowners who live right next to it and those that drive through that area on a regular basis. I do not believe it is possible to add the bleachers, stadium lighting and other elements without negatively impacting the entire area. Additionally, as the parent of a former student and graduate of Fullerton High School, I am finding it difficult to justify this project as that stadium has fulfilled the needs of this community for some time.

To summarize, I am listing the following concerns and objections to the College Sherbeck Improvement Project:

- Increased traffic in an already fully built up area
- Noise pollution
- Parking problems
- Traffic congestion
- Vendors, trash and other issues with events
- Additional strain on the Fullerton Police who are already burdened with Downtown nightlife issues
- Violation of local residents and homeowner's property rights
  - Loitering
  - Potential for increased vandalism
  - Loss of privacy
  - Noise/lighting
  - Unwelcome visitors to their neighborhood

In closing, while I have the deepest respect for Hal Sherbeck, fondness for my alma mater and would welcome improvements of another kind that also benefitted the adjacent community and Fullerton generally, I do not feel that this project in any way fulfills this. I am opposed to the Fullerton College Sherbeck Improvement Project

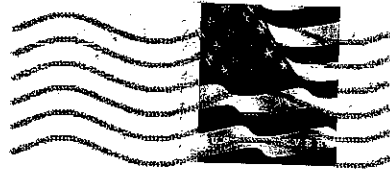
Thank you for your time and interest.

  
Amy Alspaugh

Amy J. Alspaugh  
505 Jacaranda Place  
Fullerton, CA 92832

SANTA ANA CA 926

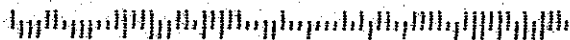
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ANAHEIM CAMPOS  
FACILITIES H&B  
2018 MAY -8 AM 9:39

Richard Williams  
District Director, Facilities Planning and Construction  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, California 92801-1819

92801-182373



R.L. Ashlock  
1218 N. Lemon St.  
Fullerton, CA 92831

April 18, 2018

To:

Mr. Richard Williams  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Re: Fullerton College Sherbeck Field Improvements Project

Dear Mr. Williams,

This letter is in response to your advisement/inquiry for comments regarding the draft EIR.

I live in the neighboring community adjacent Fullerton College. I am opposed to any further improvements or expansion of facilities at the College. Over the last 20 years of my residence here, the traffic and parking issues caused by the College have continually increased. Adding the capability for the use of the field at night for additional activities and events will further extend the periods of traffic, student/attendee parking, and noise throughout our neighborhood into the evening hours.

Thank You,

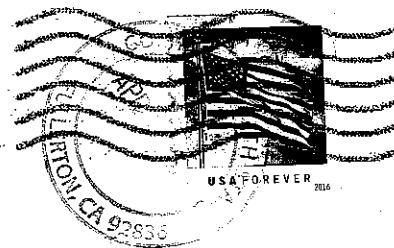
Robert L. Ashlock

A handwritten signature in black ink, appearing to read "R. Ashlock", with a long horizontal flourish extending to the right.

Robert Ashlock  
1218 N. Lemon St.  
Fullerton, CA 92831

SANTA ANA CA 926

18 APR 2018 PM 9 L

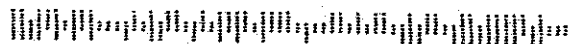


ANAHEIM CA 92831  
FACILITIES HD 9

2018 APR 23 AM 8:50

Mr. Richard Williams  
North O.C. Community College Dist.  
1830A West Romneya Dr.  
Anaheim, CA 92801-1819

92801-182373



## Rachel Struglia

---

**From:** Ken Bane <kb@banemedia.com>  
**Sent:** Tuesday, May 8, 2018 2:46 PM  
**To:** Richard Williams  
**Subject:** Comments on Stadium NOP

Below are comments on the FC Stadium NOP. Please confirm receipt, thanks.

Ken Bane  
1211 Luanne Ave  
Fullerton, CA 92831

### **4 PUBLIC REVIEW PROCESS**

*The City of Fullerton approves water access and grading/drainage*

### **6 INITIAL STUDY CHECKLIST**

*Need to add city of fullerton for water and grading/drainage*

### **ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

#### **6.10.b Land Use and Planning**

*This analysis and finding of less-than-significant impact is flawed. The site's present P-L zoning and independence from local land use control DOES NOT eliminate the possibility of potential impacts on surrounding land use plans of an agency with jurisdiction over the project. In fact, the City of Fullerton has jurisdiction for water, grading, and draining for this project. In addition, the project could have impacts that would interfere with the City's land use plans, specifically residential zoning to the north and east. THEREFORE LAND USE IMPACTS WILL BE POTENTIALLY SIGNIFICANT AND MUST BE ANALYZED*

#### **mitigations to be considered:**

- alternative location (no project i.e Fullerton HS or Yorba Linda HS)
- reduction in project size and/or use restriction agreement
- putting a dome over the project
- lowering the project below grade
- establishing a formal communication channel to resolve time/date specific complaints

#### **6.12 Noise**

#### **mitigation measures to consider should include**

- removing speakers and using innovative streaming to individual smart devices
- reduction in project size and/or use restriction agreement
- putting a dome over the project
- having all bleachers face AWAY from the homes
- lowering the project below grade

-establishing a formal communication channel to resolve time/date specific complaints including dB ongoing sound level monitoring technology possibly with the ability to volume up and down

#### **6.14 Public Services**

*Impacts will include noise complaint calls to the Fullerton Police Department and the FC Stadium Security Department.*

#### **6.16 Traffic**

*post-completion impacts will be potentially significant and must be analyzed including impacts on surrounding circulation systems and adjacent residential areas*



4/16/18

Dear Mr Williams,

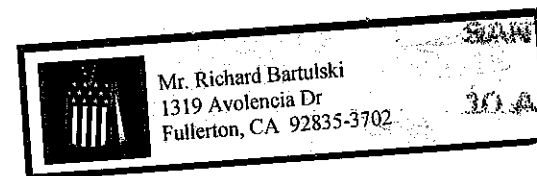
I've read the letter concerning  
"Sherlock Field Improvements  
Project." I don't know what the  
projects are but if they are  
minimal in money costs - I  
approve it.

But if it has anything  
to do with building a "New  
STADIUM" on the college campus,  
I am very much NOT IN FAVOR  
of this project.

Sincerely,

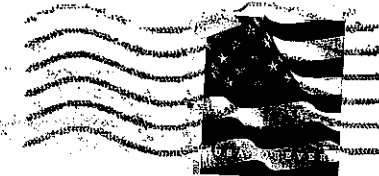
Richard Bartulski

714 525-4003



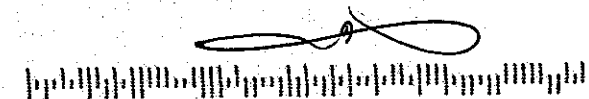
SANTA ANA CA 926

30 APR 2018 PM 3.1



North Orange Co. College District  
1830A West Romney Drive  
Anaheim, Calif.  
92801-1819

c/o Richard  
Williams



**From the desk of**      **Randolph W. Baxter**

224 Jacaranda Place  
Fullerton, CA 92832  
714-396-8858 [cell]  
714-525-0885 [home]  
[rbaxter@fullerton.edu](mailto:rbaxter@fullerton.edu)

Apr. 20, 2018

Mr. Richard Williams  
North Orange County Community College District  
1830-A West Romney Drive  
Anaheim, CA 92801-1819

re: opposition to Fullerton College field project

Dear Mr. Williams,

I am writing to express my opposition to the proposed Fullerton College Sherbeck Field Improvements Project, as outlined in the NOCCCD's letter to me dated April 9<sup>th</sup>. Though I have read the on-line descriptions of the project, I will be unable to attend the May 1<sup>st</sup> public-scoping meeting and open house.

I am a 19-year Fullerton resident who lives a few blocks from, and regularly drives the streets adjacent to Sherbeck Field. Given the concessions/warnings reported in the recent Draft EIR, I am very concerned that the Project would increase traffic, air quality, greenhouse gas emissions, and noise in the area. Rentals of the field to outside teams for competitive events, in particular, would dramatically increase traffic and noise well into evenings that do not currently suffer such intrusions.

I feel the current stadium situation is perfectly adequate for the needs of Fullerton College and area schools, so the proposed improvements to Sherbeck Field are unnecessary.

Thank you for receiving this reply, and for your efforts in responding to resident feedback on this issue. Please do not hesitate to contact me, should you have any further questions in this matter.

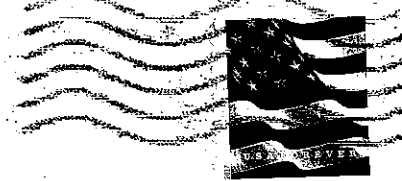
Sincerely,

A handwritten signature in black ink, appearing to read "Randolph Baxter", with a horizontal line extending to the right.

12.0412  
224 Jacaranda Pl.  
Fullerton, CA 92832-1433

SANTA ANA CA 926

25 APR 2018 PMS 1

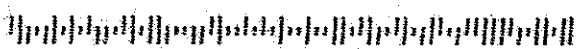


ANAHEIM CAMPUS  
FACILITIES HQ

2018 APR 30 AM 8:46

Mr. Richard Williams  
NOCCCD  
1830-A W. Romero Dr.  
Anaheim, CA 92801-1819

92801-182373



April 28, 2018

Dear Mr. Williams:

I'm writing as a neighbor to Fullerton College and I wanted to express my concerns about expanding the Fullerton College stadium project.

I have lived in my home for 18 years next to Fullerton College. I also attended Fullerton College as a youth. I value the college and the education and programs that it provides. However, I have some significant concerns about the potential project.

**Concerns:** A major issue that has come up over the years has been the way that **sound travels**. Whenever there is a construction project at FC, or a sporting event where music is played, the sound carries right into my home. It's amazing how it has actually seemed as though there is a boom box in my house when the sports teams are playing their music. When construction was taking place a few years back, it was waking me up in the morning. I walked over to the site to talk directly to the foreman and he was surprised that I could hear it so loudly at my home. It actually appeared to be louder in my neighborhood than it was at the actual site. I don't have an understanding of how sound carries, but I do know from experience that it does carry and that the sounds from the college are very loud in our neighborhood. I personally have sleep issues, and value quietness in the morning and evenings. I am concerned/and know that the sounds of the stadium events would be a huge intrusion on privacy and quiet. Actually it **WILL** be if the stadium is built.

Another concern is parking. With large events, **our street will be filled with parked cars**. With parked cars on each side, there is not enough room for two way traffic on my street (Princeton Circle W). This is a fact that I have experienced. In addition, there would be no room for **emergency vehicles** to pass through. **This is a huge safety concern.**

Also, again with cars parked on my street for events lasting until 10pm, I am concerned once again about **noise, lack of my sleep**, trash on the streets (we have already seen this with college students parking previously on our streets) and an increase in vandalism. Currently we have a quiet neighborhood and value this greatly. The stadium will change that forever. We have already in the past year had a higher incident of burglaries in our neighborhoods. (There are times when I go to bed early, but people on my street and next door at the stadium will forever prevent that....this is simply not right.)

**Safety** in pulling out of my driveway is a huge concern. With cars parked on the street, it **impacts visibility** when all of us are backing out of our driveways. As we have experienced in the past, college students and others speed up and down our streets.

In addition, the value of our homes will decrease. People will definitely reconsider purchasing a home in this neighborhood!

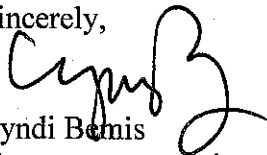
**Solution:**

It hurts my heart to know that there is a suitable space next door at Fullerton High to host events and that college has plowed forward despite residents' legitimate concerns. **I would ask the board and those in support of the project that if they were in our shoes, what would they want?** Would they still be supporting this even though they know it will impact their sleep, health and safety and that of their kids? That bright lights would be shining into their kids' bedrooms at 10pm and lots of noise outside? I only ask that you put yourself in our shoes. There are so many other things that the money could go towards: more education, other sports, etc. I imagine that the college has a long list of things they would love to spend money on.

I will admit, it's also very hard for me to see the college spend my and other's tax dollars on something that I don't support and also building or improvement projects that I could never afford for myself. I struggle to make ends meet personally and have to at times wait years to afford a single repair on my own home (My rain gutters are 68 years old and leak water, for example!). Yet, my tax dollars support FC building projects and they are state of the art. In this case, it really appears wasteful as there are other options such as Titan Stadium and FC stadium. It really strikes me as a **moral decision** when it comes to the decision of how to spend money that comes from others.

Thank you for your consideration.

Sincerely,



Cyndi Bemis

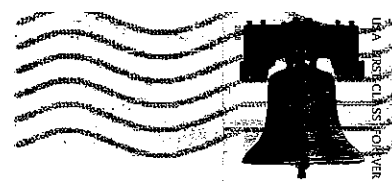
Homeowner on Princeton Cir West



Ms. Cyndi Bemis  
528 Princeton Cir West  
Fullerton, CA 92831

SANTA ANA CA 926

27 APR 2018 PM 9 L



ANAHEIM CAMPUS  
FACILITIES M.P.C.

2018 MAY -1 AM 8:50

Mr. Richard (Fred) Williams  
Director Facilities + Planning + Construction  
NOCCCD

1830 A W. Romneya Dr.

Anaheim CA 92801-1819

92801-182373

**WILLIAM H. CHAMBERS**

39178 NARCISSUS DRIVE

PALM DESERT, CA 92211

---

May 3 , 2018

North Orange County Community College District

ATT : Richard Williams

1830 W. Romney Drive

AnaHeim , California 92801

Dear Mr . Williams

I am writing to cast my 100% support to build a stadium on Sherbeck Field . This project is long over-due facility for the Fullerton College student athletes .


I was the F C Head Athletic Trainer for 38 years . I went through the trials and tribulations of having to take out student athletes off campus for football games . It was expensive for transportation and for rent, and our teams still managed to have success thanks to a great coaching staff and a desire to compete by these students .

We were always third in line at FUHS Stadium behind two high schools .

When we went to Cal State Fullerton we were always treated as outsiders and we had to go fully contained because their facility offered us very little . Now these student athletes are being bused to Yorba Linda High School for games which is not an ideal situation .

Sherbeck Field is a classroom for the football and track student athletes as well as for physical activities and a stadium on campus would be a wonderful addition to the Fullerton College Campus . A sound decision to take care of a long overdue project and provide a stadium should be made.

Sincerely



William H Chambers

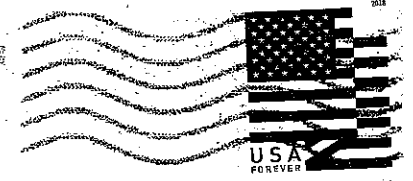
F C Certified Athletic Trainer , Retired



WILLIAM H. CHAMBERS  
39178 NARCISSUS DRIVE  
PALM DESERT, CA 92211

SN BERNARDINO CA 924

04 MAY 2018 PM 6 L



ANAHEIM CAMPUS  
FACILITIES M 06  
2018 MAY -8 AM 9:40

North Orange County Community  
College District  
ATT: Richard Wellian  
1830 W. Romney Drive  
Orange, CA 92801

5250 155555

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCE  
1830 A West Romneya Drive  
Anaheim

Martin and Maria Chavez  
625 Princeton Circle West  
Fullerton, CA 92831

RE: OPPOSITION TO SHERBECK FIELD IMPROVEMENT  
Comments for Inclusion in draft EIR

Dear Mr. Williams

My name is Martin Chavez and my wife Maria Chavez, both OPPOSE the Sherbeck Field Improvement Project for the following reasons.

**-Noise** [large crowds, cheering fans, PA announcements, horns and stomping on bleachers, extra traffic and parked vehicles behind residential homes.]

**-Light Pollution** and Negative effects of LED [the lights will reflect into the neighboring homes.]

**Generation of Trash and some Vandalism** within the surrounding community.

**Traffic and Crowd Control** from events would burden Fullerton police and the community.

To best understand how I have come to this decision, is to list some examples of each of my experiences. They would need to be mitigated and not just stated that nothing can be done to the current project as planned.

The proposed project is to install 4417 capacity permanent bleacher seats and 6 light towers with 12 loudspeaker PA. All this under the umbrella that the college can host football games, academic instruction, host competitive athletics and rental of the stadium.

First let me address the NOISE that would be generated from such proposal project. Currently we live near a stadium located on Lemon St and Berkley Ave; Fullerton High School Stadium. The crowd noise from football games during the season can be heard from Princeton Circle West and the neighboring community. And this is located about ¼ mile away from my house. I have walked my dog during the evening and can still hear the roar of the crowd up to Raymond Ave. Just recently, 30<sup>th</sup> of April 2018, there was a PA system check from FUHS Stadium which I noticed when I got home from work around 5pm. I could hear an individual just speaking, but it was not overly loud. But as the evening dragged on and when I took my dog for her walk around 7:30pm the individuals

voice was more noticeable. I figure since there was less noise pollution from vehicles and people that other noise was more profound. Currently the noise that is most produced is from the football practice that are held on the field. It is loud, but it is only the football team and coaches, practices are usually over by 6/6:30pm. Which is greatly appreciated by our family. But now the

FC campus wants to extend the hours of operation of the field use till 10pm and seven days a week, is not acceptable. So now the noise will be ongoing with no relief and knowing what to expect each day.

Just recently on the 18th of April at around 7:30pm I had some students that were parked on Berkley Ave, right behind my backyard. These two students sitting in their vehicle had the music loud. They were there for a while even after I photo flashed them, hoping to get their attention, but it seemed they were not discouraged. I decided to call FC Campus Security, so they could just bring some order to this situation. I was told they could not do anything, since it was off campus and to call the Fullerton Police Department. I did not want to do this, since this was a Fullerton College issue. I did call FPD, but was not happy in doing this, due to the fact manpower and resources were used to deal with this situation.

Secondly the TRASH left, that is the consequence of vehicles parked on Berkley Ave, right behind our homes. Currently cars parked along Berkley Ave are from those attending classes and/or events being held on Fullerton College Campus. It is well known that the trash left on Berkley is most likely from FC attendees. I myself have had to clean up some of this trash, which includes broken beer bottles.

As neighbors we had to petition the city to have parking permits. This was done after repeated complaints to FC; regarding trash, drinking alcohol, loitering and blocking driveways on neighboring streets close to FC campus.

Another issue would be the lighting considered to be installed and the hours of operation. As in any lighting there is spillage outside the controlled area. Using Fullerton High School Stadium as an example the new lighting has spillage on the outside perimeter. Due to light intensity to light the field, you have deflection of light, due to the hours of operation the FC proposed project wants to implement. Since the field is so close to homes, about 15 yards from the closest homes along Berkley Ave. it will affect many families; reflective light into homes, disrupting sleep for those that need to go to work early or school. I myself need to go to sleep by no later than 9pm and usually up by 3am to get ready for work. My daughters also get up early to go to school.

Traffic and Crowd Control needs to be addressed. Currently FC is not capable in dealing with the traffic and crowds that would be generated from such an upgrade of Sherbeck Field. The campus is not able to accommodate the vehicle parking needed on its campus and most would want to park along Berkley Ave near homes. Plus, Berkley Ave is only a two lane road and is usually busy, speeding, and dangerous road to be on.

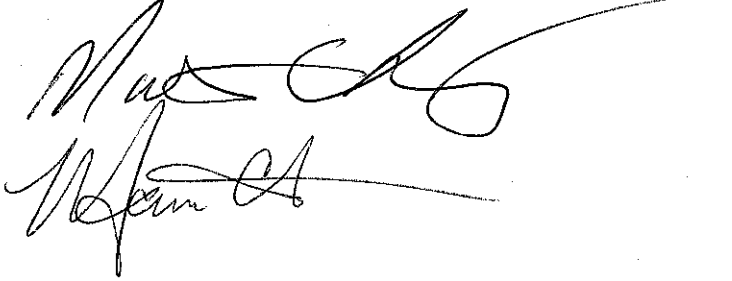
The best way to mitigate this "Stadium Proposal Upgrade" is to use alternatives that are already in place. Such as using Cal State Fullerton Stadium with a 10,000-seat capacity or Fullerton High School Stadium just renovated stadium.

If all those alternatives are exhausted than the Field Proposed Upgrade for FC should be downsized from the 4417 to maybe 1500 seat capacity. This would mitigate the noise, traffic and crowd control and the impact on the surrounding community. The initial argument for why a stadium was needed was for FC football home games. So I looked at what kind of attendance

of home games at their current Yorba Linda Stadium; it was 1200 spectators on Sept 2, 2017[[hornet.fullcoll.edu/hornets-football-kicks-off-the-season-with-ninety-fifth-key-to-the-](http://hornet.fullcoll.edu/hornets-football-kicks-off-the-season-with-ninety-fifth-key-to-the-)]. The hours of operation and rentals should also be limited to how late in the evening the field can be in operation and the times it is available on the weekends, especially on Sunday. I know firsthand that in the City of Fullerton, the Ranger Soccer Club do not start Sunday games till 12 noon and they must end by 4pm. These games are embedded into the community school fields and parks. So, it is a way for everyone to co-exist and be good neighbors.

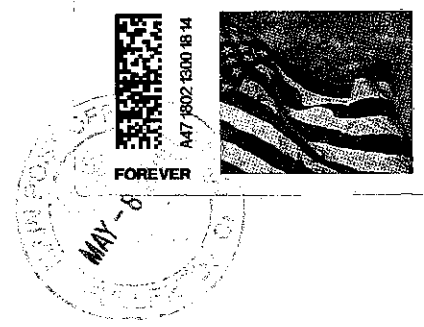
Sincerely,

Martin and Maria Chavez

The image shows two handwritten signatures in black ink. The top signature is a stylized, cursive 'M' followed by a long horizontal line that extends to the right. The bottom signature is a cursive 'M' followed by a horizontal line that also extends to the right, but is shorter than the one above it.

MARTIN & MARIA CHAVEZ  
625 PRINCETON Cir. W.  
FULLERTON, CA 92831

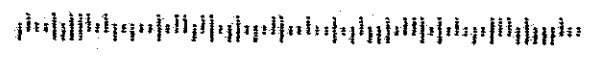
SANTA ANA  
CA 926  
08 MAY '18  
PM 7 L



ANAHEIM CAMPUS  
FACILITIES H20  
2018 MAY 11 AM 8:40

NORTH ORANGE COUNTY COMMUNITY  
COLLEGE DISTRICT  
ATTN: RICHARD WILLIAMS  
1830 W. ROMEROA DRIVE  
ANAHEIM, CA 92801

92801-183399



*Mr. Richard Williams*  
*Director, Facilities Planning and Construction*  
NOCCCD 1830 A West Romneya Drive  
Anaheim, CA. 92801

May 2, 2018  
Mr. & Mrs. T. Collier  
3301 Las Faldas Dr.  
Fullerton, CA. 92835  
RE: OPPOSITION TO SHERBECK FIELD

Dear Mr. Williams:

My name is Mr. and Mrs. Terrence Collier and we oppose the Sherbeck Field Improvements project due to:

Noise

Excess Traffic


Light Pollution and negative effects of LEDS

Generation of trash and vandalism

Crowd control

Our solution: use District Stadium at FUHS or Titan Stadium at CSUF.

Terrence and Mary Collier  
3301 Las Faldas Drive  
Fullerton, CA, 92835

A handwritten signature in cursive script that reads "Terrence & Mary Collier". The signature is written in dark ink and is positioned to the right of the typed names.



Mr. Terrence D. Collier  
3301 Las Faldas Dr.  
Fullerton, CA 92835-1737

SANTA ANA CA 926

03 MAY 2018 PM 10 L



ANAHIM CAMPUS  
FACILITIES M G  
2018 MAY -7 AM 8:55

Mr. Richard Williams  
Director, Facilities Planning  
NOCCCD  
1830 A. West Romneya  
Anaheim 92801





NORTH ORANGE COUNTY  
COMMUNITY COLLEGE DISTRICT

April 9, 2018

**To:** Distribution List

**From:** North Orange County Community College District  
1830A West Romney Drive  
Anaheim, California 92801-1819

**Subject: Notice of Preparation of a Draft Environmental Impact Report for the Fullerton College Sherbeck Field Improvements Project**

The North Orange County Community College District (District) will be the lead agency and will prepare an environmental impact report (EIR) for the proposed project identified below. The District is requesting your view regarding the scope and content of the environmental information to be included in the EIR. Responsible agencies are requested to indicate their statutory responsibilities in connection with the proposed project.

*neighbors' complaint*

The description, location, and the potential environmental effects resulting from the proposed project are contained in the initial study, which is available through the District's website (<http://www.nocccd.edu/>), Fullerton College's website ([www.fullcoll.edu/campusprojects](http://www.fullcoll.edu/campusprojects)) and at the Administrative Offices, North Orange County Community College District, Anaheim, campus located at the address above. The initial environmental review indicates that the proposed project may have potentially significant effects on the environment in the following categories: aesthetics, air quality, greenhouse gas emissions, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, tribal cultural resources, and mandatory findings of significance. The EIR will include an analysis of these impact areas, as well as feasible mitigation measures and alternatives to avoid or reduce potential impacts.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but no later than 30 days after receipt of this notice. A public scoping meeting will be held on Tuesday, May 1, 2018, beginning with a Project Presentation at 6:00 p.m. in the Fullerton College Campus Theatre (Building 1300) located at 321 E. Chapman Avenue, Fullerton, CA 92832, followed by an Informational Open House in the Fullerton College Center (Building 200), Rooms 224, 226, and 228.

Please send your response to Mr. Richard Williams at the address shown above. Please provide the name of a contact person in your agency.

## Notice of Preparation

**Project Title:** Fullerton College Sherbeck Field Improvements Project

**Project Location:** Sherbeck Field (northeastern portion of the Fullerton College campus). Fullerton College is generally bounded by North Berkeley Avenue to the north and east, North Lemon Street to the west, and East Chapman Avenue to the south.

**Proposed Project:** The College plans to install permanent prefabricated aluminum bleachers, six field lighting stanchions, a new sound system, press box, and storage building at the existing Sherbeck Field. Sherbeck Field would continue to be used for academic instruction, competitive athletics, and rentals; however, Sherbeck Field is proposed to host competitive football games, which are currently held at other locations. The inclusion of field lighting as part of the project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more class options for students who may not be able to take physical education during the day. It is anticipated that these improvements would begin in spring 2019 and would last approximately 6 months.



Richard Williams

District Director, Facilities Planning and Construction

- ✓ Fullerton Union High School has served FC for years. Do we NEED our own?
- ✓ neighbors will oppose traffic, parking, light, noise, etc.
- ✓ How do they meet P.E. classes now - and for years?
- ✓ I vote "No."

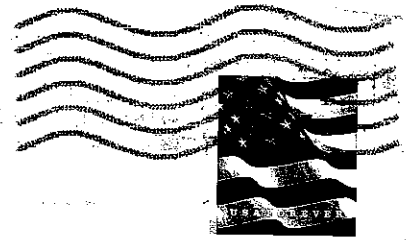
John E. Collins, Ed. D.

PS, my wife Eileen died in 2014. Please remove her name from your list. Thanks - John

265C-1964  
OHIO Dr. John E. Collins  
UNIVERSITY 1015 N Lemon St  
Fullerton, CA 92832

SANTA ANA CA 926

16 APR 2018 PM 5 L

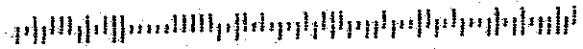


ANAHEIM CAMPUS  
FACILITIES DIV.

2018 APR 20 PM 3:34

North Orange County  
Community College District  
1830 West Romneya Drive  
Anaheim, CA 92801-1819

92801-183399



April 16, 2018

Mr. Richard Williams  
North Orange County Community College District  
1830 A West Homestead Drive  
Anaheim, CA 92801-1819

We definitely DO NOT APPROVE of the Fullerton  
College Sherburne Field Improvement Project.

We agree all the effects listed in your  
letter of April 9, 2018 is very bad for the  
environment.

We have a view lot and this would  
certainly be an impact on us.

Thank you.

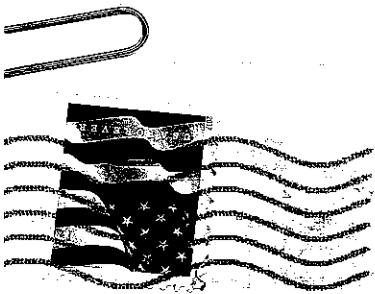
Wayne  
Alice A. Collins





92801-182373

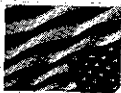
*MR. Richard Williams*  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, California 92801-1819



16 APR 2018 PM 4 L

SANTA ANA CA 926

Mr. Wayne Collins  
1000 Miramar Pl  
Fullerton, CA 92831



5/4/18

Dear Mr. Williams,

I would ask to have my voice heard regarding the proposed "Hal Sherbeck Stadium" project.

This is an unfortunate and frivolous disagreement, which could be quickly remedied. It seems to be brought on by a handful of residential neighbors in the proximity of the proposed site. Well, build the stadium, then if adjustments or concessions need to be worked-out, let everybody involved bend a little. Compromise. It looks like to me, the major compromise has already been reached -- lights out by 10:00 p.m. Problem solved. If that doesn't suffice, work it out.

It seems a shame that if Fullerton College would benefit and the city of Fullerton would benefit, and certainly neighboring businesses in the area would benefit... build it. The infrastructure alone makes this a more than worthwhile venture. An awful lot of food would be put on the table's of those who work on the construction of this stadium.

As an aside, I played at the Fullerton Stadium across the street, many years ago -- four years worth. Three years while I was at Troy High School and a season while attending Fullerton College. This was in the late seventies and early eighties. There were no problems to speak of. Game was over, people left. They went home. Sadly, a sour few in the neighborhood have created quite a sour situation. Much tah-doo about nothing. Build It.

When I played at Fullerton Community College, it was a true "community" gathering. North Orange County folks, pulling for a community team, while watching great football at the same time. That should never change. That community should be watching the games in a well-deserved stadium.

Coach Hal Sherbeck changed many a young man's life on the proposed site of this stadium. Men that would go on to coach, and relay his strong beliefs. Men that would go on to be successful in the world of life. Stand-up, meaningful, contributing men.

My Pop Warner coach, Pete Laborde, was a major influence in my youth. He played for Coach Sherbeck. In high school, I had countless coaches who played for Coach Sherbeck. Dennis Dixon, who taught me how to be a man, on and off the field. Craig Feola, who opened the weight room every day at 6:00 a.m., and worked-out with me, so I could attain a greater success on the field and in life. They played for Coach Sherbeck.

It seems ludicrous to me, that so few can raise a voice, all in protest over a few Saturday nights, or a few Friday nights here and there, because they (might) be slightly inconvenienced.

In the name of a legendary coach and man... let the legacy of Coach Hal Sherbeck live on. Build it!

Thank you for taking the time to consider my thoughts on this matter.

Sincerely,

Fred Crissinger III

Fullerton College Hornet, 1982



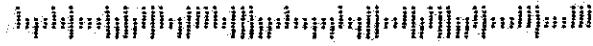
F. CRISSINGER  
2161 HAMER DR.  
PLACENTIA, CA 92870



ANAHEIM CAMPUS  
FACILITIES HQ  
2018 MAY -8 AM 9:40

NORTH ORANGE COMMUNITY  
COLLEGE DISTRICT  
ATTN: RICHARD WILLIAMS  
1830 W. ROMNEYA DRIVE  
ANAHEIM, CA 92801

9280181833 C023



Anna Dalin  
629 Princeton Circle East  
Fullerton, CA 92831

May 8, 2018

North Orange County Community College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, CA 92801

Dear Mr. Williams:

I am writing to express my opposition to the Sherbeck Field Improvements Project. I oppose it for several reasons:

- The light of the proposed improvements will disrupt the sleep of our neighborhood's children, older residents and that of adults like my husband who must get up at 5:00am every day to teach an early period as a teacher. For these three populations, sleep research has shown that it is not enough for the tall field lights to be turned off at 9:00pm. They must be turned off at least one half hour earlier to allow human eyes to start preparing for sleep in a dim environment.
- The sound of the events and speakers will also disrupt the sleep of our neighborhood's children, older residents and that of adults who must rise early. Per the Environmental Protection Agency (EPA), some of the results of noise pollution are: increased aggression, lack of sleep, decreased motivation, hypertension, fatigue and anxiety, increase in heart rate. **Especially in children, noise such as from large outside events causes many detrimental effects** including negatively affecting a child's acquisition of speech, language, and language-related skills, such as reading and listening; causing Noise Induced Hearing Loss (NIHL), which is especially caused by prolonged exposure to high levels of noise or by the sudden high level (impulse) noise which will often occur at college events; causing tinnitus, causing elevated blood pressure and other cardiovascular ailments
- I am saddened that the College is not considering the fact that while this stadium will bring in revenues to the College, it will decrease the value of all neighborhood homes significantly. This is insult upon injury, and not very "community"-minded for a community college. Why should we be financially affected by the College's plans?
- I am not looking forward to the trash, parking and traffic safety issues that will be caused by increased use of the field.

- Architecturally and from an urban planning perspective, it is silly and also unattractive for two stadiums to be located so close together. You already have a beautiful stadium that you can use at Fullerton High School.
- The big stadium of a four-year college should be a goal for athletes to look forward to, and is unnecessary for a junior college. Community college funds should be reserved for programs which help all students prepare to successfully transfer to four-year colleges and/or prepare for fulfilling career futures.

Thank you for your time.

Sincerely,

Anna Dalin



[annawynne@hotmail.com](mailto:annawynne@hotmail.com)

ANAHEIM CAMPOS  
FACILITIES MED

2018 MAY 11 AM 8:40

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romero Drive  
Anaheim, CA 92801

Anna Delia  
629 Princeton  
Fullerton, CA 92831

SANTA ANA  
CA 926  
08 MAY '18  
PM 9 L



Wayne Dalin  
629 Princeton Circle East  
Fullerton, Ca 92831  
May 6, 2018

Mr. Richard Williams, District Director, Facilities Planning & Construction  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Dear Mr. Williams:

I'm writing regarding the Pre-EIR and the college's proposed expansion. Some of the issue I would like to see addressed are as follows:

- There is a potential for parking problems. If the stadium is used in its full capacity there is a potential for overflow in the neighborhood. Even if parking is free, some people prefer to park far away and walk to not have to deal with the hassle of getting out of a sporting event. Some questions:
  - Will there be any mechanism in place to monitor parking after the stadium is built? Could a citizen's group be created to monitor parking in the stadium's infancy? This body could count cars to notify the school if there is a problem with people parking in neighborhoods so the college could take some action. Could the college hire an agency to do this in the first year of the stadium?
- Living by the college, trash is regular problem on Berkeley. After sporting events, attendees often litter in the area close to their car.
  - Will the college identify what trash looks like at other similar sized stadiums? Can they put in place a system to ensure that detritus from a sporting event doesn't spill over to the neighborhoods close by?
- Light pollution will be an inevitable consequence of the stadium. Musco, the company currently bidding for the lighting contract, argues that there will be no light pollution. They have shown mock-ups that present a stadium with no light pollution. However, I believe these mock ups are nothing more than photoshopped pictures, and that the low-level lighting they promise is not possible. When I spoke with a Musco representative I was instructed to visit the stadium at Chapman College during a football game. I was told that the lights at this stadium were representative of the technology that would be utilized at Sherbeck Field. However, I was disappointed when I walked further than 100 feet (the closest home are only 80 feet from the proposed lights) from the stadium and was able to read a book in the glare.
  - Will the college go to Chapman stadium and evaluate the real-world lighting conditions created by the lighting stanchions? If the college only takes the data provided from Musco, then they are not actively engaged in discovering the real

world effects of Musco's lights. The college's "research" must go beyond using the data provided by Musco. Looking at similar sized stanchions of the same make and size seems essential to identify the light pollution generated by the stanchions.

- Will the college put into place an oversight committee, either community controlled, or one run by the Facilities department of the college to evaluate the light pollution once the lights are actually up? It is possible the lighting projections provided by Musco, or even predicted by the college, might not match the real effects of the lighting. A monitoring body needs to be in place to evaluate and possibly make changes if the glare is far beyond that predicted by Musco or Fullerton College. If the EIR calculates a certain amount of light pollution, and the trustees vote on those effects, but the effects turn out to be great than supposed, than this process is not fair, but rather disingenuous.
- Noise pollution will probably be the biggest factor ruining the lives of the neighbors. Some homes are 80 feet away. The college should take into consideration the following:
  - Ground vibration caused by students pounding on the bleachers. The college should take several measurements:
    - Stadium with average capacity at football games
    - Stadium with projected playoff capacity at football games
    - Stadium with all seats filled, for a possible concert or sporting event
  - An acceptable answer is NOT:
    - The college will forbid this behavior, because this answer does not take into account the possible usage scenarios. The college has the potential for rentals throughout the entire year. Board members have written to me (emails can be provided) indicating that at some time they suspect the stadium will be rented out by outside groups. When the stadium is currently being used by outside groups there are NO NOISE CONTROLS. NO ONE FROM THE COLLEGE IS PRESENT DURING RENTALS TO MONITOR NOISE. Hence, if this policy is continued, there will be no one present to stop a game facilitator from encouraging the people in the stadium to pound on the bleachers. Therefore
      - The college could consider having a specialist dedicated to monitoring noise at all events hosted by outside groups to ensure that these groups fall into the noise compliance goals set in place by the EIR
    - Ground vibrations are worse than noise. Unlike noise, where doors and windows can be shut, there is no way to stop the effects of ground vibration. There are long lasting effects of ground vibration. There have been several studies linking increased heart rate and adverse affects on sleep due to ground vibrations caused by railroad cars. Some homes with young children are 80 feet away from the stadium and have bed times between 7-8 pm. The college must find a way to stop the bleachers from being stomped on lest the sleep of young children be interrupted. I suspect

aluminum bleachers might be even worse because of the loud noise generated by aluminum.

- A recent study published in the Noise & Health Journal indicated that there is a link between night time noise exposure and cardiovascular disease. This study also concluded that low-level noises can impact health due to sleep disturbances. The college might argue that the noise generated by sports events is sporadic, and not continuous, therefore no noise mitigation needs to occur. However, the study in the Noise and Health Journal and other studies have concluded that these sporadic noises can interrupt regular sleep rhythms. In particular, children exposed to loud, episodic sounds, especially those above 80 decibels will most likely experience disturbances in their sleep cycles. To me, this behavior seems criminal. To mitigate these loud sounds, the following options exist:
  - Enter into a contractual agreement with the residents limiting rental use. Every instance of field use with sizable crowds will most likely result in the loss of sleep for the young children that live close to the stadium. Limiting the use of the field is one key way of mitigating this problem.
  - Build a sound wall. While a sound wall will most likely limit some of the aesthetic features of the stadium that the College would like to have, the benefits to nearby residents are sizable. A sound wall, if well-designed, might lessen the noise (in terms of decibels) of large crowds. Landscaping could be utilized to enhance the aesthetics of such a wall.
- A shared use agreement with the Fullerton Joint Union High School District (FJUHSD) to use the stadium at Fullerton High School is the best way to mitigate the noise generated by games. The college makes some claims which need to be addressed:
  - The college claims that a shared use agreement is impossible based on California Community College Athletic Association Regulations. The two issues of concern are goal post sizes and hash marks.
    - Aaesports.com, sportsfieldspecialties.com, and wizardsports.com, are three of many possible companies that sell goal posts which are adjustable and can be utilized by both the high school and college. The adjustability allows them to be compliant for both high school and college level football rules. FJUHSD has shown themselves to be very open to this possibility.
    - Because the field is astroturf as opposed to natural grass, it can be repainted as needed, thus allowing the wider hash marks to be painted for college level games.
- The college claims that lighting and bleachers are needed at Sherbeck field for their athletic programs and fitness classes that they hope to offer. The community is not against lighting for the field so it can be used for fitness classes and a reasonable amount of bleachers. However, stadium lighting, and the addition of 4,417 seats will change the fundamental nature of the community that the college resides in. Minor modifications should be made to Sherbeck Field to allow for greater evening use for fitness classes and track and field. However, the disruptive, loud nature of college football games (in



addition to whatever rentals the college deems fit in which the citizens have no say), with noise spikes that will interfere with the sleep of residents and small children, should be prohibited. A shared use agreement for college football games with FJUHSD, who are extremely supportive of such an agreement, seems like the best use of resources for Fullerton College.

- Finally, if the college does wish to be a “good neighbor,” they need to create a body with which residents can make noise complaints if the stadium is built. Several times during the year the current field is used by groups who often bring their own sound system. These groups are either unaware of the nearby residents, or simply don’t care, but they blare their music and make announcements, and because the school is public grounds that are not under regular noise restrictions, the only recourse of citizens is to approach the event organizers. Sometimes, the organizers are accommodating, and sometimes they simply shrug their shoulders and say they have rented the facility and to go away. If the college desires to act like a “good neighbor” then they need a representative on site at all times, especially when the facilities are used by outside groups, to ensure they stay within the noise parameters set by the college. If the college refuses to do this then the EIR is disingenuous because every group that rents out the stadium has the ability to create noise that is a nuisance to the neighborhood. If the college chooses to let other groups utilize their facilities then they need to be accountable to the citizens as “hosts” of these events. To simply let an outside group use Fullerton’s facilities and not give the citizens a way to stop noise nuisance as it occurs, is not being responsible, nor is it being a good neighbor.
- If the college plans on continuing with this inane idea, the cost of maintenance of the stadium needs to be identified and where the ongoing funds for this must be identified since bond construction fund can’t be used for regular maintenance.

I am 100% opposed to the stadium and believe the college does NOT NEED it to fulfill it’s educational mission. Its educational mission has been fulfilled for decades without a stadium. To argue that this stadium is a need is ridiculous.

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Dalin". The signature is fluid and cursive, with a long horizontal stroke at the end.

Wayne Dalin

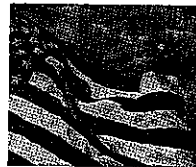


Mr. Wayne Dalin  
629 Princeton Cir. E  
Fullerton, CA 92831-2727

ANAHEIM CAMPUS  
FACILITIES MFG

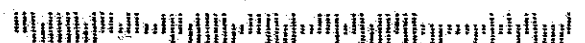
2018 MAY 11 AM 8:41

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Attn: Mr. Richard Williams  
North Orange County Community  
College District  
1830A West Romnaya Drive  
Anaheim, CA 92801-1819

92801-182373



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## RE: Sherbeck Field Improvements Project

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4/21/18

447, E. Amerige Ave  
Fullerton, CA 92832

Dear Mr. Williams:

I have resided in Fullerton since 1986 and have owned the property listed above for 20 years.

I have witnessed an increased amount of development in this city, especially in the last five years...most of which has been negative.

This correspondence is to notify you of my strong dis-approval of the Sherbeck Field Improvements Project.

This project will have many negative impacts to my neighborhood including increased traffic & greenhouse gas emissions, increased noise, increased light pollution, increased foot traffic, increased littering and loss of valuable parking spaces.

I am not able to attend the public scoping meeting scheduled for 5/1/18.

This correspondence will serve as my formal disapproval and condemnation of this proposed project.

Sincerely,

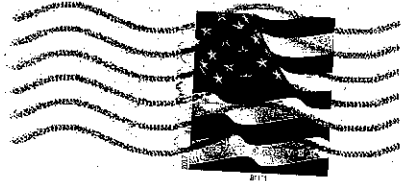


Ruth Davies

 **Ruth Davies**  
447 E Amerige Ave.  
Fullerton, CA 92832-2005

SANTA ANA, CA 926

25 APR 2018 PM 7 L



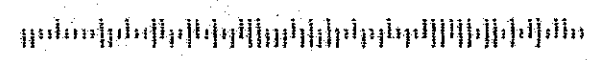
ANAHEIM CAMPOS  
FACILITIES HQ

2018 APR 30 AM 8:46

North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Attn: Mr. Richard Williams

92801-182373



North Orange County Community College District  
1830A West Romney Drive  
Anaheim, Calif. 92801-1819

Ronald J. Dymek  
524 Princeton Circle West  
Fullerton, Calif. 92831

Attn: Mr. Richard Williams

Dear Mr. Williams,

My wife and I are long time Fullerton residents. Our home is one block east of Berkeley and just south of Brookdale Avenue. We are a few hundred yards from the Sherbeck Field and the proposed project.

We strongly object to the proposed improvements, especially the 4500 seat bleachers, the six field lighting stanchions, a new (and very loud) sound system and all the additional noise, traffic congestion, pollution and trash it will create. The EIR initial review mentioned in your letter date April 9, 2018 brings up very good points as it states "The initial environmental review INDICATES that the proposed project may have **potentially significant** effects on the environment in the following categories: aesthetics (causing decreased property values) air quality (health issues) green house gas emissions (more health issues) hazard and hazardous materials, noise (decreased property values and quality of life) public services, recreation, transportation and traffic, tribal cultural resources.....

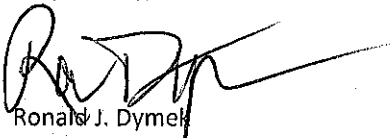
Berkeley Avenue is riddled with trash daily from the students parking who will not pay for on site parking. Does anyone really think that allowing a stadium that can seat up to 4500 people will not impact our lifestyle, our quality of life and our quiet neighborhood? We have a significant number of senior citizens (including me) who have worked hard to enjoy a quality of life that includes peace and quiet.

We petitioned the City of Fullerton for permit parking due to the traffic congestion on our streets resulting from the trash, drug paraphernalia, condoms and the safety issue parking in our neighborhood created. Most of the events you are suggesting will last long past the 7 PM restriction our permits have now. There is no parking restriction on weekends or when school is not in session, meaning our neighborhood will become the parking for these events.

We currently have noise pollution from the softball field that is just adjacent to Sherbeck Field during games. Apparently loud, amplified music has become a normal part and apparently necessary addition to playing or practicing for soft ball games. While some of us work from home, others study and have young children trying to nap during the days. The sound has become unbearable and has caused some neighbors to confront the team manager and athletic director. We can only imagine the sound and light pollution from the new proposed stadium. We feel this proposed stadium is an unnecessary waste of financial resources and other options and locations are available for you proposed activities.

Our quality of life and property values will be significantly and permanently changed in a very negative way and we adamantly object to this proposed stadium improvements.

Respectfully,



Ronald J. Dymek

ANAHEIM CALIFORNIA  
FACILITIES INC.

2018 MAY -3 AM 8:54



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Mr. Richard Williams  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA

92801-1819

92801-182373



North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, Calif. 92801-1819

Ronald J. Dymek  
524 Princeton Circle West  
Fullerton, Calif. 92831

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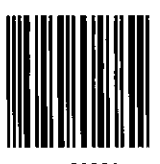
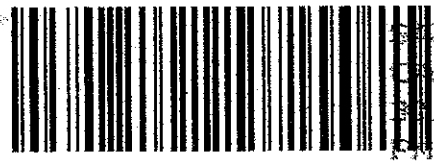
Respectfully,



Ronald J. Dymek



2 Dynek  
524 Princeton Cir W  
Fullerton CA 92831



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APR 30, 18  
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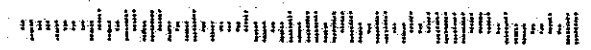
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92801

NOCCCD / Mr. Richard Williams  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

attn: Mr Williams

92801-182373



ANAHEIM CA  
FACILITIES  
2018 MAY -3 AM 8:54

Dear Mr. Williams,

I respectfully request that you consider my thoughts on the proposed Fullerton College stadium.

We bought our house in 1983 because we love this college town and wanted our children to grow up in this small town. We love this area so much that in 2006, we decided that instead of moving, we would tear down our house and rebuild it! We consider ourselves good neighbors and we have a "tight" neighborhood. We have July 4th block parties and we are the neighborhood that hangs the lighted Christmas balls each year. We have organized block events too!

The top four reasons I oppose the building of this stadium are as follows:

1. Safety.
2. Noise.
3. Property value.
4. Future impact.

1. Our former Fullerton Police Chief and Councilman Mr. Pat McKinley recognized our neighborhood in 2010, as lacking wide enough streets to be able to accommodate parked vehicles on both sides of our streets. Emergency vehicles need to be able to drive down our streets. Students parking in our neighborhood were creating a variety of problems, but safety was the most significant impact on us at the time. We were successful in getting resident parking only permits by petitioning the city council to allow the tax-paying homeowners to be able to live in a safe and quiet neighborhood and to be able to park in front of our own homes.

The possibility of up to 4500 sports fans in approximately 2000 cars arriving in our neighborhood at one time for an event, knowing they will park on our public streets rather than pay for college campus parking, will not allow ADEQUATE EMERGENCY ACCESS to the neighborhood!

Drive down Berkeley Avenue during a normal school day, when classes are in session, and you will see that the parking situation continues and will continue to get worse as time has proven. I believe that this problem could be rectified by simply offering your students free parking in your structure(s).

2. My noise concern really is not a small one. My husband has a 24-hour emergency service business and has trouble hearing his business calls when the music is amplified. We have an adult child who became disabled while he was a FC student. He has sleeping problems, so he sleeps during the day at times which can be difficult on FC softball days. Even when he was a student at FC, he complained about the noise from the fields as he attempted to study.

For some reason, the noise resonates in my house, although we have double-pane windows and close all of them and our doors.

I can only imagine how loud the stadium noise will be. With the hours of operation being from 6 am to 10 pm and the coming and goings before and afterwards, you leave your neighbors sleeping hours of 11 pm to 6 am. This is not being a good neighbor.

3. Each homeowner losing upwards of \$100,000 in property value. This figure is based on what happened to the property values in Point Loma neighborhood when the stadium was built. I'm wondering if the neighbors who own nearby properties here realize the financial detriment the stadium would put us in. 500 neighbors signed our petition and at \$100K each, we stand to lose \$50M collectively!

4. I lack confidence that what you put in writing or promise us verbally will actually be carried through new administration and/or different chancellors. More specifically, if you promise us that you won't rent it out to anyone else than you currently do, that it most likely will not be true later on. I doubt that "It is being completed for student use," means that it will be used only for 7 FC football home games.

The Master Plan Program EIRs concluded that FC should avoid impacts on its neighbors. I feel that the building and use of this stadium will significantly impact my quality of lifestyle and also my neighbors'.

On your Fullerton College website, one of your many Core Values states: Community - We promote a sense of community that enhances the well-being of our campus and surrounding areas.

We are your surrounding area.

Please love thy neighbor.

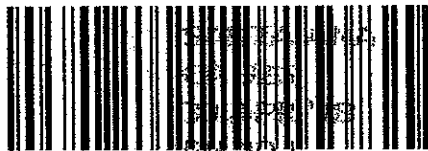
Please do not do this to your neighbors.

Again, I respectfully submit my request,

A handwritten signature in black ink, appearing to read "Shaun Dymek", with a long, sweeping horizontal line extending to the right.

Shaun Dymek

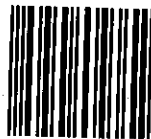
S Dynek  
524 Princeton Cir W  
Fullerton, CA 92831



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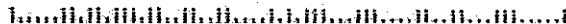
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MAILING SERVICE

2018 MAY -3 AM 8:54

Mr. Richard Williams  
District Director of Planning & Facilities  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801

00004 1 00000



April 28, 2018

701 Harmony Lane  
Fullerton, CA 92831

Attn: Mr. Williams

Re: Fullerton Junior College Stadium

Director, Facilities Planning & Construction

Dear Mr. Williams,

We write to express our opposition to the building of a stadium for Fullerton Junior College. We have two large stadiums within 5 minutes of our house and can't imagine why there is a need for another. Our understanding was the costs for the Fullerton High School stadium improvements were justified in part by the benefit it would provide in sharing it with the J.C.

The J.C. already creates a large increase of traffic and safety issues in our neighborhoods. We have students parking in front of our houses, "jay-walking" to get to/from their classes; imagine the increase in all these areas another stadium will bring. We can't safely ride our bikes with our kids in our neighborhood due to the traffic and lack of visibility caused by streets lined with cars. There will be more noise, traffic congestion, trash, vandalism, bright lights etc. It would increase the need for police patrols as well.

Our solution is for the J.C. to use the Fullerton High School Stadium and save the money for something that truly benefits the entire community.

Thank you for your consideration,

Todd & Petra Farquhar

Todd and Petra Farquhar

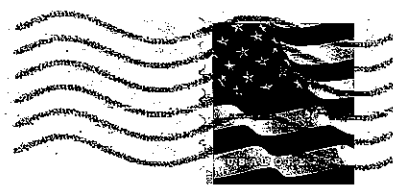
701 Harmony Lane  
Fullerton, CA  
92831

ANAHIM CAMPUS  
FACILITIES M E

2018 MAY 11 AM 8:41

SANTA ANA CA 926

08 MAY 2018 PM 9 L



Mr. Williams  
Director Facilities Planning  
and Construction  
NOCCCD  
1830 A West Romneya Dr.  
Anaheim, CA 92801-1819

92801-182373

## Rachel Struglia

---

**From:** Richard Williams <rwilliams@nocccd.edu>  
**Sent:** Tuesday, May 8, 2018 5:53 PM  
**To:** Rachel Struglia; Rod Garcia; Gregory Schulz; Oscar Saghie; Fred Williams  
**Cc:** Kimberly Kimble  
**Subject:** Fwd: Comments on IS Sherbeck Field

Please find message from Fullerton resident, Mary Gable regarding the initial study for Sherbeck Field.

---

From: Mary Gable <mfrangable@gmail.com>  
Sent: Tuesday, May 8, 2018 5:01 PM  
Subject: Comments on IS  
To: Richard Williams <rwilliams@nocccd.edu>

05/08/2018

Mr. Richard Williams, District Director, Facilities Planning & Construction  
North Orange County Community College District  
1830A West Romney Drive  
Anaheim, CA 92801-1819  
[RWilliams@nocccd.edu](mailto:RWilliams@nocccd.edu)

Dear Mr. Williams,

I am writing to address impacts from the proposed project located at Sherbeck Field. I offer the following comments and suggested mitigations in response to the Initial Study for Sherbeck Field Improvements dated April 2018.

### 3.1 Background and Project History

According to the IS, the field was originally constructed in 1956. The homes east of the field predate the construction of a field by a few years. Our home on Princeton Circle West was built in 1954. Previous attempts to build a stadium like the proposed project were rejected. ***The project should be rejected outright because of historical precedent of rejecting a stadium at the exact proposed location.*** It was removed from the Projects in 2016. It was cancelled in 2007 and in 1973, the location was judged to be altogether unacceptable for a stadium. In 1973, Fullerton Mayor Robert Root requested a study to be done by the chamber of commerce to find a location for a city stadium as reported on 11/27/1973 in the Fullerton News Tribune. This exact location was rejected because, *"the location is primarily residential; traffic and parking is historically a problem there; access is poor."*

Within this sentence is found the primary problems of this project. **The area is landlocked by residential houses.** The location is on **Berkeley Avenue**, a street that **was intended by Fullerton's Master Plan to 1) provide significant relief to downtown Fullerton's traffic congestion problems and 2) significantly speed up traffic flow from North to East Fullerton and vice versa**, doing so by providing a convenient route circumventing the downtown (Harbor Blvd.) area. **Access** to said stadium is indeed poor. Berkeley is a heavily travelled 90 foot wide street. **Parking** will also continue to present problems as people prefer street parking to structure parking, primarily because of access. Construction on the Centennial Parking Structure is not scheduled to begin until 2020.

### 3.2 Project Objectives

*My Comments: The Project Objectives are easily achieved without much of what has been proposed in the Initial Study.*

Under Section 3.2 Project Objectives the IS says,

The proposed project's main objectives are as follows:

Project Objective 1. Provide field lighting to allow for more evening class options for the physical education program to meet student demand.

*My comments: It may be fairly argued that the Project outlined in the IS is not a classroom and therefore must be subject to approval by the City of Fullerton. Calling this project a classroom does not make it so. It is unreasonable and disingenuous to call a facility with 4417 seats, 6 stadium field lighting stanchions, 2@60 feet, 2@ 100 feet and 2@ 125 feet, 12 arrays of speakers, a field house with locker rooms for home and visiting teams, a ticket booth, a press box that, "would house the Sport Information Director, statistician, announcer, score keeper, score clock operator, radio and television broadcasters, and local media and press." and a*



planned parking structure for 840 vehicles, a classroom. Stadiums are not considered classrooms under the legislative history of California Statutory Law and Cal. Gov. Code sec 53097 (b) gives cities jurisdiction over facilities for non-classroom use. If it is indeed a classroom, then low level replacement lighting should suffice as stadium lighting is unnecessary. Students i.e. football players, paying for the "class" held in this classroom are granted at most 2 hours of credit for practice which has in the past and can continue to take place during the day or under 60 foot replacement lights. This project is indeed a stadium and must comply with the city's General Plan and Zoning Regulations and be approved by the Fullerton City Council.

**Suggested Mitigation:** This could be accomplished by replacement of original 60 foot light standards that were previously on the field.

Project Objective 2. Provide a football field for the Fullerton College football program that meets the sizing requirements of the California Community College Athletic Association Regulations, Bylaw 4.2.6 A.

**My comments:** *Proposed action on project is unnecessary as the existing field is already compliant with CCCAA regulations. If this study is referring to a replacement of current playing field at YLHS, then this objective is only necessary for playoffs, two games at maximum. A suitable alternative for these games is already available.*

**Suggested Mitigation:** None.

Project Objective 3. Install permanent bleachers to reduce the costs associated with renting bleachers for the annual Fullerton College commencement ceremony.

**My comments:** *There is a suitable alternative next door at Fullerton High School.*

**Suitable alternative:** *Use FJUHS stadium. According to section 2.3 the college, Commencement Ceremony requires seating for approximately 7,200. Seating capacity of 4,417 is therefore not enough. FJUHS stadium has 6500 seats and therefore is a suitable alternative if students are seated on the field. In fact, it accommodated FC graduation until 2015.*

**Project Objectives Do Not Include Rentals:** Project Objectives listed in the IS are inconsistent with stated tables of availability of use for rental. No mention of rental is included in the Project Objectives.

**Suggested Mitigation:** No rentals of Sherbeck Field. Or a limited use agreement in perpetuity negotiated with neighbors and representatives of the Fullerton College Neighborhood Action Council.

### Initial Study Checklist

**My comments:** *Adding the stadium Project to previously approved projects in the prior EIR imposes **Cumulatively Considerable Negative Impacts on the neighborhood.***

Sherbeck Stadium has been incrementally planned and built over the course of 12 years. Paid for by Measure X in 2010, FC built a field house and box office at a cost of ~ \$4.3M, and installed artificial turf and a track, at a cost of ~ \$1M. The college also installed underground electric cables planning to later install stadium lighting which was not included in the EIR. Paid for by Measure J and approved 12/2017, FC plans to build an 840 space parking structure behind the field house, at a cost of ~ \$29M. In the current project, FC is planning bleachers to seat 4417, a sound system, lights and possibly a press box. This will cost ~ \$4M. The term field is disingenuous. Please analyze the cumulatively considerable negative impacts of all pieces of this stadium noted above in addition to projects funded with Measure X and Measure J.

### 6.1 Aesthetic Significance of Projects's Lighting

The IS incorrectly states that there would be a less than significant impact on a scenic vista. There are several neighboring homes located on Dorothy Drive, Sheppard Dr. and Cannon whose homes and yards have a scenic vista. Many have a view of Catalina Island. If the stadium were built, it would have a potentially significant impact on the views of these homes.

The IS is correct in saying, "The proposed project could have a substantial effect by degrading the existing visual quality of a site or creating a new source of substantial light or glare." Drawings of the project in the college's IS are disingenuous showing lighting only on Sherbeck Field, when in fact, the entire campus between Lemon and Berkeley, encompassing numerous athletic facilities and parking facilities and structure is lit until late at night. Social and economic changes may result from both the proposed lighting from the 6 stadium field lighting stanchions, 2@60 feet, 2@100 feet and 2@125 feet, and the proposed noise from the 12 arrays of speakers. The addition of these impacts to the surrounding environment constitutes a significant physical change to the surrounding area and should be mitigated.

**My comments:** *Neighborhood homes to the East are within 100 feet of the proposed playing field, while neighbors to the North are located on a hill, directly facing into the light. The project's proposed lights will create glow, spill and ambient light for several blocks as well as visual pollution in a city with building height restricted to 9 stories. Also the cumulative impact of the project's proposed 79.9kW total power load of the field lighting added to existing lighting on campus and lighting from the approved Centennial Parking Structure will impose considerable cumulative impact on neighboring houses. Neighbors are already subject to lights, including blue lights all night long at the Lemon parking structure. Substantial impacts that should be considered are listed below:*

**Please revise the IS to include analysis of the scientifically proven Negative Effects of Bright Light which include but are not limited to:**

**Nighttime light suppresses melatonin secretion in humans.** ("In 1980, researchers at the National Institute of Mental Health (NIMH) demonstrated that exposure to 2500 lux of bright white light at night strongly suppressed production of melatonin." from: Lewy AJ, Wehr TA, Goodwin FK, Newsome DA, Markey SP. Light suppresses melatonin secretion in humans. Science. 1980 Dec 12;210(4475):1267-9.)

**Negatively affects neighbor's normal daily pattern of life.** (Several teachers and others who go to sleep early expressed concern of how the lights would affect their sleeping patterns.)

**Damage to retinas, both human and animal.** (<http://www.brightfocus.org/macular/article/are-bright-lights-damaging-eye>) Bright Focus Foundation

**Lights with significant blue light have been proven to cause eye damage.** (T-24) (Gunnar Optics <http://www.gunnars.com/artificial-lighting-and-the-blue-light-hazard/>)

**Disruption of Circadian Rhythm.** ([DarkSky.org](http://darksky.org), issue #80, 2010 Find at: <http://darksky.org/wp-content/uploads/2015/06/NS80.pdf>)

**Numerous scholarly articles have concluded that human exposure to artificial lighting** such as lights used at CSUF's Intermural Field (Musco #228 LED at 5700 Kelvin with 65 cri) **is detrimental to human health in numerous ways especially causing retinal degeneration:**

"The photoreceptors in the retina . . . are susceptible to damage by light, particularly blue light. The damage can lead to cell death and diseases." Shaban H, Richter C. A2E and blue light in the retina: the paradigm of age-related macular degeneration. Biol Chem 2002 Mar-Apr;383(3-4):537-45.

"It is not too harsh to state that virtually all persons with vision problems should be removed from a light environment where the predominant light waves are a temperature above 3500K or a wavelength less than approximately 500 nm." Elaine Kitchel, [M.ED.VI](#). The effects of fluorescent light on the ocular health of persons with pre-existing eye pathologies. American Printing House for the Blind, 2000.

"Exposure to the eye to intense light, particularly blue light, can cause irreversible, oxygen-dependent damage to the retina. We have found that illumination of human retinal pigment epithelium cells induces significant uptake of oxygen that is both wavelength and age dependent...and contribute to the development of age-related maculopathy." Rozanowska M, et al. Blue light induced reactivity of retinal age pigment. Journal of Biological Chemistry 1995; 270(32):18825-18830.

" . . . high levels of exposure to blue or visible light may cause ocular damage, especially later in life, and may be related to the development of age-related macular degeneration." Taylor HR, West S, Munoz B, Rosenthal FS, Bressler SB, and Bressler NM. The Long Term Effects of Visible Light on the Eye. Archives of Ophthalmology 1992; 110:99-104.

"The effectiveness of light in inducing photodamage to the retina increases with decreasing wavelength from 500 to 400 nm." Andley UP, L.T. Chylack Jr LT. Recent Studies on Photodamage to the Eye with Special Reference to Clinical and Therapeutic Procedures. Photodermatology Photoimmunology and Photomedicine 1990; 7:98-105.

" . . . continuous exposure to blue light is potentially dangerous to vision." Koide R, Ueda TN, Dawson WW, Hope GM, Ellis A, Somuelsen D, Ueda T, Iwabuchi S, Fukuda S, Matsuishi M, Yasuhara H, Ozawa T, Armstrong D. Nippon. Retinal hazard from blue light emitting diode. Ganka Gakkai Zasshi. 2001 Oct;105(10):687-95.

"I think chronic blue light is probably damaging." Joshua Dunaief, MD, in Bethke W. Should We Block The Blue. Review of Ophthalmology Oct 15 2003; 10(10).

"Because sunlight and many high-intensity artificial light sources contain relatively high proportions of blue, and the retina as well as pigment epithelium contain several types of blue-absorbing molecules, the short-wavelength band of the visible spectrum may contribute to the pathogenesis of age-related macular degeneration and amplify some forms of inherited retinal degeneration." Remé CE, Wenzel A, Grimm G, Iseli HP. Mechanisms of Blue Light-Induced Retinal Degeneration and the Potential Relevance for Age-Related Macular Degeneration and Inherited Retinal Diseases SLTBR Annual Meetings Abstracts 2003.

" . . . the photon catch capacity of the retina is significantly augmented during blue-light illumination, which may explain the greater susceptibility of the retina to blue light than to green light. However, blue light can also affect function of several blue-light-absorbing enzymes that may lead to the induction of retinal damage." Grimm C, et al. Rhodopsin-Mediated Blue-Light Damage to the rat Retina: Effect of Photoreversal of Bleaching. Invest Ophthalmol Vis Sci 2001 Feb;42(2):497-505.

All quotes above are referenced in the following article are from: **Living Well With Low Vision, entitled, "Artificial Lighting and the Blue Light Hazard."** <http://lowvision.preventblindness.org/daily-living-2/artificial-lighting-and-the-blue-light-hazard/#blue>

**Suggested Mitigation:** Replace only the 60 foot tall practice lights used for classes after dark and hold football games and/or other events only during the day.

**Suggested Mitigation:** If Project is built as described, Fullerton College should pay for light blocking shutters for affected neighboring homes.

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Please conduct a study that would show the comparative impacts of Project lighting vs. replacing only the 60' lighting that was previously in place on Sherbeck Field.**

### **6.3 Air Quality**

*My comments: I agree with the IS's assessment that the both the short term and long term impacts would be potentially significant. As busses bring in athletes for competitions and rental events, air quality will suffer greater than significant and even negative impact.*

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

### **6.4 Biological Resources**

*My comments: I have observed all birds mentioned in the report in my backyard. The addition of the Project's proposed 6 stadium field lighting stanchions, 2@60 feet, 2@100 feet and 2@125 feet with 79.9kW total power load of the field lighting added to existing lighting on campus and lighting from the approved Centennial Parking Structure will impose considerable cumulative impact on the birds and wildlife in the area. Most wildlife depends upon circadian rhythm for sleep cycles and the Project's proposed use hours from 6am until*

10 pm Mondays throughout Saturdays and from 6am until 8pm on Sundays will negatively impact wildlife as well as animals living at FHS farm. I contest your findings from October of 2016 that there are no raptors within 200 yards of the project. On 5/6/2018 - 5/8/2018 as I have been writing this, I have had a red tailed hawk flying around my backyard. I have pictures and videos as proof.

**Suggested Mitigation:** Replace only the 60 foot tall practice lights used for classes after dark and play football games and/or other events only during the day.

**Suggested Mitigation:** Reduce seating capacity.

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Please conduct a new study that considers the raptors which frequent my yard. Please include expert bird-watchers who live in the area including Bob Singer.**

## **6.7 Greenhouse Gas Emissions**

*My comments: Greenhouse gasses are increased by added exhaust from increased vehicular traffic and sports lighting.*

**Please consider the following article and revise the IS to include analysis of increase in greenhouse gasses caused specifically from sports lighting.**

*The sports lighting would add to ozone levels in Fullerton.* An article from the American Chemical Society reports that, a brightly lit sports stadium provides, "enough light to drive certain chemical reactions in the atmosphere that would boost daytime levels of ozone, one of the most prevalent and difficult-to-control air pollutants in urban areas." (From: "Monitoring the Skies" Chemical and Engineering News, **American Chemical Society Magazine**, Feb. 11, 2009 Press Pac)

**Suggested Mitigation:** Replace only the 60 foot tall practice lights used for classes after dark and play football games and/or other events only during the day.

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Please conduct a study that includes the cumulative impact of greenhouse gas emissions from additional vehicular traffic to area for sporting events in addition to the lights at proposed Project in addition to the lights at FJUHS stadium.**

## **6.12 Noise**

*My Comments: This is an area of significant concern to the neighborhood. The lay of the land is unique to our neighborhood as homes to the East are within 100 feet of the proposed playing field, while homes to the North are located on a hill, creating a natural amphitheater. Noise from Fullerton High School already carries east to Raymond Avenue. Noise from sports fields are already heard as far north as the peak of Luanne Ave and Skyline. The proposed project could have a substantial negative impact on residents by degrading the existing quality of life through a new source of noise pollution resulting from the array of 12 speakers. Social and economic changes may result from the proposed noise pollution from the 12 arrays of speakers. Many residents work from home, some have hearing sensitivity, one homeowner has a sound studio in his home. Neighbor's sleep schedules would be disrupted by speaker and crowd noise before dawn and after dark. The addition of these impacts to the surrounding environment constitutes a significant physical change to the surrounding area.*

**Please revise the Initial Study to Analyze the following Negative Effects of Noise from proposed project rental (available from 6 am until 10 pm, Mondays through Saturdays and 6 am until 8 pm on Sundays) and use of proposed array of 12 speakers which include but are not limited to:**

Prolonged exposure to moderate levels of noise involving irrelevant speech can effect performance, unlike the moderate intensity white noise of 55dBA noted as Fullerton's limit.

[A 2003 study reported in Noise and Health Journal entitled, "The effects of background noise on cognitive performance during a 70 hour simulation of conditions aboard the International Space Station."

There are three major factors that determine the effect of noise on cognitive performance: Intensity (loudness), type of noise, and duration. **Moderate levels of noise can affect performance**, depending on it's type and duration. For example, moderate intensity white noise (55 dB), has little or no effect on performance while **moderate intensity irrelevant speech can seriously disrupt performance** (LeCompte, 1994; Smith, 1999). The effect of duration has received little attention to date, however, Smith and Miles (1985) have demonstrated that **the longer the exposure the greater the decrement in performance.**

**Significant background noise may negatively affect performance in a number of ways** (see e.g. Smith, 1989. A review of the effects on noise on human performance. Scand. J. Psychol., 30: 185-206.). In some cases the **noise may directly affect one's ability to perform a task** but there are also many ways in which noise can disturb task performance indirectly. For instance **noise may disrupt sleep patterns, disturb normal social behavior or increase subjective feelings of stress all of which could ultimately lead to poor performance in cognitive tasks.**

**Loud background noise (above 90 dBA) typically reduces the quality of performance. A number of studies have demonstrated that noise hinders performance on cognitive tasks involving vigilance, decision-making, and memory** (see Broadbent, D. E. (1971). Decision and stress. New York: Academic Press.; Smith, A.P. (1989). A review of the effects on noise on human performance. Scand. J. Psychol., 30: 185-206; Salas, E., Driskell, and Hughes, S. (1996). Introduction: The study of stress and human performance. In Stress and Human Performance. Driskell, J. E. and Salas, E. eds. Lawrence Erlbaum, New Jersey, pp 1-45; Banbury, S. P., Macken, W. J., Tremblay, S., Jones, D. M. (2001) Auditory distraction and short-term memory: Phenomena and practical implications. Hum. Factors, 43: 12-29). According to Broadbent's, now classic, theoretical treatment of the effects of noise on performance, loud noise leads to over-arousal, which narrows attention, restricting ones focus to a limited range of cues. This inability to attend to less salient cues ultimately **leads to deterioration of performance.**

The negative effects of noise are not limited to cognitive performance. **Recent work has demonstrated that noise disrupts both social behavior and indices of subjective stress** (Salas, E., Driskell, and Hughes, S. (1996). Introduction: The study of stress and human performance. In Stress and Human Performance. Driskell, J. E. and Salas, E. eds. Lawrence Erlbaum, New Jersey, pp 1-45. ). From: Noise and Health, A Bi-Monthly Interdisciplinary Journal. <http://www.noiseandhealth.org/article.asp?issn=1463-1741;year=2003;volume=6;issue=21;page=3;epage=16;aualast=Smith>

**Suggested Mitigation:** If Project is completed as described, college should pay for triple paned windows and light blocking shutters for affected neighboring homes.

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Suggested Mitigation:** Use streaming media instead of speakers.

**Suggested Mitigation:** Direct all sound towards the south, as neighboring homes are much further away towards the south.

**Please conduct a new noise study as prior study, if used as a baseline, was misleading.** (Noise data for the IS was gathered on 12/15/2017 when college classes had virtually ended for the break, no activity was occurring on Sherbeck Field and sound was only gathered across the street to the east of Sherbeck Field, not up the hill which forms a natural amphitheater. Gathering data on a Friday, the 2nd to the last day of classes is totally disingenuous.) **Collection of Misleading Noise Data MUST BE REMEDIED during collection of data for EIR.** A fair assessment of noise must be taken and should be gathered on days when the college is in session and field use is heaviest. This would more accurately reflect the impact of greater amount of noise brought on by the Project.

#### **6.15 Recreation**

*My comments: The Initial Study adequately describes areas to be analyzed. The Project Objectives as stated in 3.2 should constitute the only use of the Project because the negative impacts on the neighborhood outweigh any positive benefits of future community use.*

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Please conduct a new study of alternative venues that meet the needs of Project Objectives. See requests under Alternatives Analysis\* on page 11.**

#### **6.16 Transportation and Traffic**

*My comments: Regarding traffic impacts and safety hazards:*

*Purpose of Berkeley was to be an alternate route for Fullerton residents going up Harbor to avoid traffic. Project size and stadium use will bring in hundreds or thousands of vehicles causing traffic difficulty for residents and may eventually necessitate the installation of 2 new traffic signals making a total of 4 traffic signals over 0.9 miles of Berkeley between Chapman and Lemon and 5 between Chapman and Harbor. This is too much traffic for a two lane avenue.*

*This will also negatively impact Wilshire and overburden the corner of Chapman and Berkeley.*

*Crossing Berkeley is already dangerous for pedestrians, extra traffic from a new parking structure will exacerbate this problem.*

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Please conduct a new traffic study as prior study, if used as a baseline, was misleading. Collection of Misleading Traffic Data MUST BE REMEDIED during collection of data for EIR** A fair assessment of traffic must be taken and should be gathered on days when the college is in session and field use is heaviest. This would more accurately reflect the impact of greater amount of traffic brought on by the Project.

*Last time the college studied the traffic on Berkeley, they did so on days when traffic is lightest. The first day data was collected was on Friday, 11/03/2017. I believe the data collection stayed up for five days which included Saturday, Sunday, Monday and Tuesday. Two of those days were weekends and hardly any classes meet on Fridays. The Monday and Tuesday were during the week that ended on November 10th, Veteran's Day. Often during weeks that end on holidays, classes are cancelled or attendance is just lighter.*

*Additional comment: As I was completing this letter, at approximately 3:08 pm, there was an accident on Berkeley right behind my house. (I took a picture in case you don't believe me.) Thankfully, the persons involved do not seem to be injured, and are currently exchanging information. But in times past, I have had to call the police when severe injuries were involved. I can not imagine how much worse this would be if more sports events, many involving children, took place at Sherbeck Field.*

#### **6.19 Mandatory Findings of Significance (b)**

*My comments: The neighborhood homes east of the college were built in 1954 and predate the existence of a practice field on Sherbeck. If I were to put my home on the market right now, I would be required by law to disclose to any potential buyer that there may be a stadium built behind my property. It is clear from this fact that a stadium located next door to a home is considered by law to result in negative social and economic circumstances.*

**Please revise the Initial Study to Analyze the Negative Social and Economic Effects suffered by homeowners living next to the Project, including, but not limited to the following:**

**Stadium Creates a Public Nuisance and Safety Hazard on numerous levels:**

*No limit on use creates 7 days/week traffic, light & noise problems.*

*Impact would be unlike anywhere else in the area. Area is right next to an often heavily populated downtown and an established, historic residential neighborhood.*

*Numerous similar situations across the US testify to the negative impacts on neighbors.*

*Decrease in property value and increase in neighboring houses being turned into rentals.*

**Suggested Mitigation: Fullerton College makes payments to homeowners who are adversely affected in lieu of devaluation of housing values and disruption of quality of life.**

#### **6.19 Mandatory Findings of Significance (c)**

*My comments: The proposed Project will have environmental effects which will cause substantial adverse effects on human beings, directly and indirectly. The Project added to prior projects since 2009 will indeed have impacts that are cumulatively considerable.*

*When completed, the Project will consist of a venue with 4417 seats, 6 stadium field lighting stanchions, 2@60 feet, 2@ 100 feet and 2@ 125 feet, 12 arrays of speakers, a field house with locker rooms for home and visiting teams, a ticket booth, a press box that according to the IS, "would house the Sport Information Director, statistician, announcer, score keeper, score clock operator, radio and television broadcasters, and local media and press." and a planned parking structure for 840 vehicles. The cumulative effects of*

allowed use as noted in the IS from 6am until 10 pm Mondays through Saturdays and from 6am until 8pm on Sundays will present an extremely negatively impact on neighboring homes.

**Proposed Stadium Is Unnecessary:**

Proposed stadium is located right next to a renovated stadium FC has used for years.

Participation in intercollegiate football does not require a stadium, merely a field.

Only 1 PE credit is necessary for an AA degree.

Only 1 PR credit is accepted in transfer to a CSU and no PE credits are accepted to a UC school.

As it exists, Sherbeck Field is acceptable for intercollegiate play.

**Suggested Mitigation:** Limit size and use of Project so that it achieves only project objectives for evening classes, a football field for the Fullerton College football program, and annual commencement ceremony.

**Suggested Mitigation:** Compensatory remuneration to owners of neighboring homes affected by the Project.

**\*Alternatives Analysis**

For some reason, your Initial Study has not included any alternative options to the Project. I encourage a robust analysis of project alternatives in order to mitigate, or eliminate, impacts of the proposed Sherbeck Field Improvements Project. In the EIR, ***please include a side-by-side cost analysis that includes all costs associated with use and maintenance and compares cost of Project with cost of options. At a minimum, please include the following alternatives:***

**Alternative Location of Stadium:** The IS has not included any analysis of opportunities for joint use of comparable stadium facilities within the area. ***Please include an analysis of opportunities for joint use of comparable stadium facilities within the area, such as those found at California State University Fullerton and, with adjustments, FJUHS stadium, as well as identifying all other potential existing locations and analyzing the feasibility and costs associated with such use. In addition, include an analysis of the ability to construct a new stadium at the Cypress College campus. Please also include a comparative analysis of environmental impacts between proposed Project and use of other alternatives.***

**Suggested alternative of a shared use agreement with FJUHS Stadium:** A suitable alternative, located a few hundred yards away, shared use of the publicly funded Fullerton Joint Union High School Stadium is an obvious and viable option. With few easily accommodated changes, modifications could be made to field markings and goal posts to make the venue acceptable for regulation play for FC playoff games. Adjustable goal posts are available. Turf markings can be swapped out. A joint use agreement would be a **better use of public funds**. Cooperation between these two public entities could enhance one stadium that **would eliminate numerous negative impacts noted in the IS, provide a more environmentally friendly, better and safer option.** ***Please include analysis of costs of a joint use agreement between the FJUHS and the college that defines upgrades and accommodations the college deems necessary for football play at the high school and costs of commencement ceremonies.***

**Reduction of Improvements to Sherbeck Field:** ***Please include an analysis of a reduced-scope stadium improvements.***

I have many concerns about the college's plans to finish its stadium Project on Sherbeck Field at Fullerton College. It is my conclusion that after taking into consideration the above significant impacts on the neighbors, Fullerton College should abide by the precedent under which it has operated for 95 years and use other facilities for its football games, and not install a stadium on Sherbeck Field. The IS notes that on many counts there will be potentially significant impact on the neighborhood. For many neighbors, negative social and economic changes will result from the Project. Compensatory remuneration to owners of neighboring homes must be awarded to neighbors who are affected by the Project. Project Objectives can be simply met without numerous proposals in the Initial Study. As a neighbor and representative of the 500+ signatories of the petition against the construction of a stadium on Sherbeck Field, I propose that the EIR incorporate the specific mitigation measures provided above into the design and operation of the project. As representative of the Fullerton College Neighborhood Action Council, I expect to be notified of any and all newly mitigated revisions.

Thank you for receiving my concerns.

Sincerely,

Mary Frances Gable

Mary Frances Gable, Resident  
637 Princeton Circle West  
Fullerton, CA 92831-2731

P.S. I also submitted my comments in writing through certified mail.



NORTH ORANGE COUNTY  
COMMUNITY COLLEGE DISTRICT

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[NOCCCD Email](#)



Mrs WILLIAMS

5-2-2018

(FULLERTON COLLEGE STADIUM)

BEFORE STADIUM IS COMPLETE  
THINGS THAT SHOULD BE DONE

- ① PARKING STRUCTURE
- ② NO STREET PARKING ON BERKELEY  
DURING ANY EVENT
- ③ (SAFETY FIRST) TO MANY STUDENTS  
CROSS BERKELEY TO PARK  
THEIR CARS SOMEONE IS GOING  
TO GET HIT BY A CAR (SOMEDAY)
- ④ HAVE ENOUGH PARKING ON CAMPUS  
DONT SELL PARKING PASSES, UNLESS  
YOU HAVE ROOM OR SPACES  
AVAILABLE
- ⑤ SCHOOL SHOULD PICK-UP ALL TRASH  
ON A DAILY BASIS DONT LEAVE  
IT TO THE CITY.
- ⑥ NO NEIGHBORHOOD PARKING AT  
ANYTIME



THANK YOU. GARY

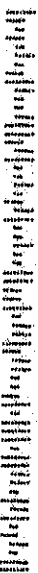
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GOODE FERN DR  
FULLERTON, CA

92831

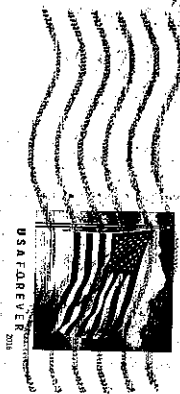
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2018 MAY -7 AM 8:55

92801-182373



Mr. Richard Williams  
NCCED  
1830 A WEST Pomeroy Drive  
Anaheim, CA 92801-1819

SANTA ANA CA 926  
DE MAY 2018 PM 2 L



May 4, 2018

Richard Williams  
District Director, Facilities Planning and Construction  
NOCCCD  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Subject: Fullerton College Sherbeck Field Project

I object to the project and demand that it be denied.

The college has more than adequate sports facilities; better scheduling will accommodate additional needs.

This project will over burden the surrounding community. It will create pollution of all kinds, including sound, light, congestion, and trash. The demand for more parking will further encroach on city streets and create safety hazards.

There are numerous sports facilities nearby that can be scheduled and used. The college and the city does not need this vanity project; one that has not proven to be financially viable.

Submitted by:

A handwritten signature in black ink, appearing to read 'Kathleen Goodno', written in a cursive style.

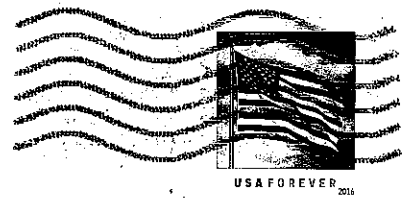
Kathleen Goodno  
806 Harmony Lane  
Fullerton, CA 92831-1908

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Ms. Kathleen E. Goodno  
806 Harmony Ln.  
Fullerton, CA 92831-1908

SANTA ANA CA 926

05 MAY 2018 PM 5 L

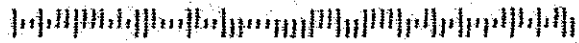


Richard Williams, District Director  
Facilities Planning & Construction  
NOCCCD  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

ANAHEIM CAMPO  
FACILITIES HQ

2018 MAY -8 AM 9:38

92801-182373



Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

April 30, 2018

Jonathan Gottlieb  
600 E Glenwood Avenue  
Fullerton, CA 92831

Dear Mr. Williams,

Please take the time to reconsider and oppose the construction of a new stadium at Fullerton College. I have lived across the street from the college for almost 20 years. During this time, a new stadium has been proposed and rejected. If a new stadium is needed, please consider using the Fullerton High School's newly refurbished stadium. It will cost less and also have access to closer parking without overflowing into the accompanying neighborhoods with visitors as the proposed stadium off of Berkeley.

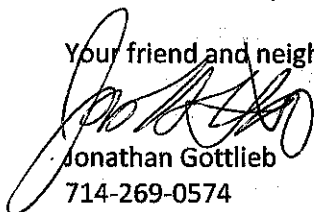
Here are the main reasons for my opposition:

1. Generation of trash of all kinds and types.
2. Noise-of additional cars, trucks, street racing, car security alarms and people/fans.
3. Vandalism of private and commercial property including graffiti, theft and general mischief.
4. Drunkenness-this includes liquor, trash, vomit and other human waste.
5. Illegal parking plus parking for profit.
6. Lighting on from 6 pm to 10 pm. (80,000 watts of sleep disturbing LED Light)
7. Traffic congestion before and after events
8. Lewd conduct
9. Illegal and unlicensed street vendors, whether they are selling food or paraphernalia
10. Increased overtime for Fullerton Police Department
11. Outside rental 7-days/nights per week from 6am to 10pm

I offer solutions: as I mention Fullerton High School is the perfect solution or the use of Titan Stadium at CSUJ Fullerton. Remember, UCLA and USC do not use on campus stadiums and they are major football colleges. I deem using one of our local schools as an answer to an amicable and quick solution to your stadium needs. Please be a good neighbor and consider this solution.

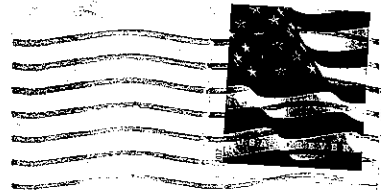
I look forward to participating in this process.

Your friend and neighbor,



Jonathan Gottlieb  
714-269-0574

Jonathan H Gottlieb  
600 E GLENWOOD AVE  
Fullerton, CA 92831

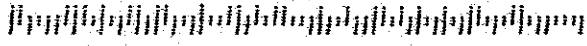


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FACILITIES MFG

2018 MAY -3 AM 8:54

MR. RICHARD WILLIAMS  
DIRECTOR, FACILITIES PLANNING & CONSTRUCTION  
NOCED  
1830 A WEST ROMNEYA DRIVE  
ANAHEIM, CA 92801-1819

92801-1819 0023



## Rachel Struglia

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**From:** Rob Grantham <robgrantham@aol.com>  
**Sent:** Tuesday, May 1, 2018 3:02 PM  
**To:** Richard Williams  
**Subject:** FC Sherbeck Field Improvements Project

As a longtime homeowner in the lower Raymond Hills area, I am, of course, concerned about the affect the proposed project will have on the local neighborhood. The houses to the north and east of the field would be the most directly affected, and these are homes that are part of the originally tracts in the area, built in the 1950's and earlier, with many families being long-term neighbors of the college.

While many in the neighborhood are strong supporters of the college, and understand the need to improve the college facilities in order to continue to provide a quality education to our local students, no one project will have such a far-reaching affect on the entire neighborhood, in terms of light and sound pollution. If a stadium did not already exist, located right next door to the college, no less, then the need for the college to construct one of their own would hold more validity. However, when Fullerton High School has just spent millions of dollars to renovate the stadium directly across the street from the college, with new lighting and sound systems, the need for the college to, effectively, build their own right next door, seems unwarranted.

Those who live to the north of the FUHS stadium already have to deal with increased light and sound pollution from this renovated stadium, so for them to then have to also deal with the same from a second stadium directly next door does not seem either fair or justified. Parking is also of great concern to the neighborhood, as, although there is a parking structure on Lemon which serves the college, the location of the proposed stadium is not close enough to the structure for the game attendees to realistically utilize. This will, of course, mean that they will be parking along Berkeley and further into the neighborhood, as evening events will be outside of regular college hours, for the most part.

I urge the college to reach an agreement with the high school for renewed joint usage of the newly-renovated stadium, and if the college feels that additional improvements need to be made, then perhaps some of the Sherbeck Field Improvement Project funds could be redirected there instead.

The city of Fullerton has always been a "college town," and is somewhat unique in the way in which its downtown includes a mix of businesses, homes, schools, college -- living together in a rather unique symbiosis. It is my hope that this project does not tip the balance so far in one direction that this will be forever irreparably damaged.

Thank you for taking the time to read my thoughts and concerns regarding this project.

4-28-18

Robert & Susan Harmston  
1000 N. Yale Ave.,  
Fullerton, CA 92831  
714-879-4716

Mr. Richard Williams,

We are writing in regards to the proposed stadium at Fullerton College. We see no need for such a stadium in our neighborhood. We have lived in our home near the college for 42 years now and we fear for our peace and quiet along with the noise and light pollution. Along with this stadium would come more traffic in our neighborhood, congestion, loitering, and trash that we already deal with from student parkers on our streets!

There is a suitable field right next door as well as one at CSUF that can be rented by the college. That would save the college and city from having to hire more police officers to have increased overtime policing these events. And we all know well that it wont be just used for a few football games. We've researched other cities that have faced this same dilemma and they have horror stories to tell about the fields being rented out 6-7 days a week and the vandalism, graffiti, thefts, etc. that come with it! We already get the noise in the distance from the games at FUHS and that is tolerable, but if you let them build close to our homes, well then, we will have lighting on all hours of the day and night that will disturb sleep and noise levels that would prevent any neighbors from having any family events! We already get enough traffic in the daytime when school is in session! Please don't add to our headaches!

We are totally opposed to this project moving forward for the above reasons. We look forward to participating in this process.

Thank you,  
Bob & Sue Harmston



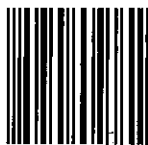


ROBERT A HARMSTON  
1000 N YALE AVE  
FULLERTON CA 92831-2743

ANAHEIM CAMPUS  
FACILITIES & E & O



1000



92801

U.S. POSTAGE  
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FULLERTON, CA  
92834  
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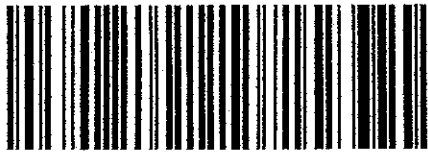
R2305K140778-03

2018 MAY -3 AM 8:54

7017 3040 0000 5805 4961

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT  
OF THE RETURN ADDRESS. FOLD AT DOTTED LINE

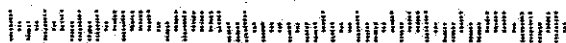
**CERTIFIED MAIL®**



7017 3040 0000 5805 4961

*Mr. Rickson*  
*Director, Facilities Planning & Construction*  
*NOCCLD*  
*1830 A West Romneya Dr.*  
*Anaheim, CA 92801-1819*

92801-182373



Mr Richard Williams  
Director, Facility Planning and Construction  
NOCCCD  
1830 West Romneya Drive  
Anaheim CA 92801-1819

May 4, 2018

Dear Mr. Williams,

I writing to voice my opposition to the proposed improvements to Sherbeck Field. My primary concerns are stated below:

### **Trash Impacts**

The current use conditions of both the college and the existing athletic fields generates a large volume of trash along Berkeley Avenue and in the surrounding neighborhood due to overflow / on-street parking. Currently Fullerton is doing nothing to mitigate these impacts, instead relying on City services (routine street sweeping) and residents (such as myself) to remove the trash left by campus users. I personally remove trash from the front of my home on a daily basis while school is in session, and trash along Berkeley Avenue sits in the curb and gutter for days until street sweeping by the City removes it.

Fullerton College currently has no best management practices to mitigate its trash impact to the surrounding community. How does Fullerton College intend to mitigate the increased trash generated by the users of the proposed improved Sherbeck Field? Are these impacts identified in the EIR and how will they mitigated? Will Fullerton College provide additional funding to the City so that street sweeping can be performed multiple times during the week? Will Fullerton College have its maintenance staff perform daily manual litter removal on along both sides of Berkeley and the surrounding neighborhoods?

### **Traffic Impacts**

Fullerton College currently generates an increased traffic volume in the area while school is in session. Additionally, overflow parking from the campus entering the neighborhoods contributes to not only increased traffic on residential streets, but also the trash impacts discussed above. Often the evenings and weekends are the only reprieve residents have from these existing traffic impacts.

With the proposed improvement of Sherbeck Field, residents can expect the traffic impacts remain high into the evenings and weekends. How does Fullerton College intend to mitigate these impacts? Are these impacts identified and mitigated in the EIR? Will Fullerton College provide funding to the City for a traffic study and the costs associated with adjusting traffic signal timing in the area to account for increased traffic flows in the evening and on weekends?

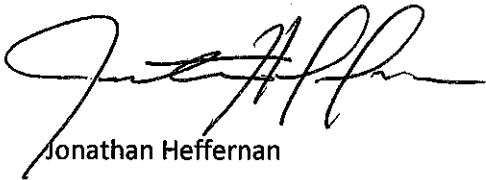
The only solution I can offer to the parking situation is that Fullerton College waive its parking permit requirement during the evenings, weekends, and during special events at Sherbeck Field. This would

encourage Sherbeck Field users to park their vehicles on campus, and keep them out of the neighborhoods.

When I moved into my home in 2010, I understood there would be some negative impacts from living so close to a community college and, although I do not like the current levels trash and traffic, I have (begrudgingly) come to accept them. However, an increase in these negative impacts is unacceptable, especially when the proposed use of Sherbeck Field includes renting it out to third parties. The neighborhood will have to live with the negative impacts while Fullerton College will reap the reward.

I appreciate you considering my concerns, and look forward to participating in the process.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jonathan Heffernan', written in a cursive style.

Jonathan Heffernan  
545 N Yale,  
Fullerton CA 92831

cc:

Mr. Eloy Oakley  
Chancellor  
California Community Colleges Chancellor's Office  
1102 Q Street, Suite 4400  
Sacramento, CA 95811

Heffernan  
545 N. Yale Ave  
Fullerton, CA 92831

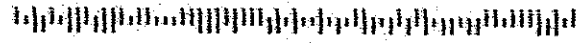
SANTA ANA  
CA 926  
05 MAY '18  
PM 11



ANAHEIM CAHNP  
FACILITIES MGT  
2018 MAY -8 AM 9:39

Mr. Richard Williams  
NOCCCD Facilities Planning + Construction  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



Mr. Richard Williams  
Northridge County Community College Dist  
1830 A West Harmony Dr.  
Granheim, Ca 92801-1819

April 16, 2018

RE: Fullerton College Sherwood Field Improvement Project

A line just north of the Field end  
are totally & completely against the  
proposal.

The noise & lighting from the  
field would greatly impact  
the pleasure & use of my home  
and yard.

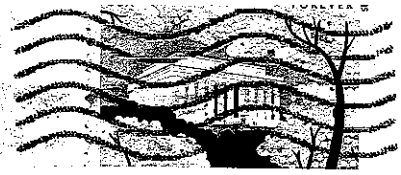
There are 3 stadiums nearby  
by that can be rented & used  
for competitive football and  
I believe the existing facilities  
are adequate for educational  
purposes.

Justin A. Hean  
180 Harmony Dr., Fullerton, Ca  
92831

3. Judith Hirou  
5 Harmony Ln  
Millerton, CA 92831

SANTA ANA CA 926

17 APR 2018 PM 10 L

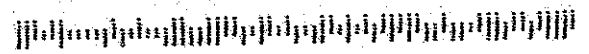


2018 APR 20 AM 8:42

Mr. Richard Williams  
Northridge Community College Dist  
1830 A. West Broadway  
Inglewood, Ca 92801-1819

College Sherbrook Field  
Improvement Project

92801-1833999



Barner: 651 E. Fern  
Fullerton  
CA 92831

\* I object to this  
project.

Re: Sherbeck Field Impr.  
Proj

Bishop J. Kenny

PO Box 924  
Dana Point  
CA 92629

SANTA ANA CA 926  
13 APR 2016 PM 11



Richard Williams  
No. OC College Distr.  
1830 A West Roneya Dr.  
Anaheim

CA 92800



Ellen Lentz  
413 Dorothy Drive  
Fullerton, CA 92831

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

RE: OPPOSITION TO SHERBECK FIELD IMPROVEMENTS: Comments for  
inclusion to draft EIR

Dear Mr. Williams,

As you can see from my address, I live right by Fullerton College on Dorothy Drive directly up from the college (not Dorothy Lane). I absolutely and vehemently OPPOSE this plan. We must already tolerate much from FC students and the school and this plan would magnify the effect of your college on our neighborhood. Our house is directly uphill from the proposed stadium.

1. The noise from games would be intolerable (we know this because we are affected by the speaker system and crowd noise from Fullerton High School which is not nearly as close). We were told that the "home" section would directly face our house. Would you like to live here? (We can hear every word spoken over the PA at the FUHS stadium.)

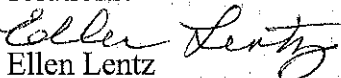
2. The lights from FC campus are already bright with the parking garage lights on all night. Add stadium lights five + nights a week and it would be as if we have lost part of the night, every night. **Light pollution is a very real and negative condition.** One I prefer not to experience.

3. The traffic is already unbearable during the school day. The college students seem to follow their own set of traffic laws and FREQUENTLY jeopardize other drivers' lives. Berkeley and Lemon have become almost impassable during the day and we find we must avoid it, which is very hard from our house. **If you add events in the evenings and on weekends you are impacting our quality of life to an even greater extent.** At the beginning of every semester our street is flooded with parked cars.

4. Home values will plunge. No one is eager to live next to not one but two stadiums. And that is most unsettling for people in retirement who are counting on the equity in their house for their later years.

We already have to deal with the noise from Fullerton High School; trash and unsafe drivers from the college; our street hijacked with sloppily parked cars, heavy traffic, and now you want to further destroy our neighborhood.

Would you want to live here? There are other, better, more neighborhood friendly solutions.

  
Ellen Lentz  
714 879-3024

Ellen Lutz  
413 Dorothy Dr  
Fullerton, CA  
92831

SANTA ANA CA 926

05 MAY 2018 PM 5 L



ANAHEIM CAMPUS  
FACILITIES M & B

2018 MAY -8 AM 9:39

Mr. Richard Williams  
Director Facilities Planning & Constr.  
NOCED  
1830 W. Romney Dr  
Anaheim, CA

92801-182373

92801-182373

May 2, 2018

Mr. Richard Williams  
Director, Facilities Planning & Y Construction  
NOCCCD  
1830 W. Romneya Dr.  
Anaheim, CA 92801

Fred Lentz  
413 Dorothy Drive  
Fullerton, CA 92831

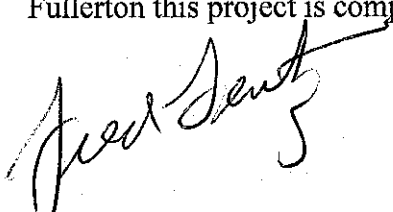
RE; OPPOSITION TO SHERBECK FIELD IMPROVEMENTS: Comments for  
Inclusion in draft EIR

Dear Mr. Williams:

Before attending last night's "scoping" meeting I was apprehensive about the proposed new stadium, euphemistically being called by NOCCCD a "field". After last night I came away completely opposed to it. I will give you some of my reasons:

1. The disruption to the neighborhood and beyond: The noise, traffic, trash, and careless, dangerous driving.
2. Home side: we are appalled that the home side of the "field" will be facing the neighborhood. The resultant enhanced crowd noise will be intolerable.
3. FC football draws only a few hundred people while you are proposing seating for almost 5,000. Do NOT call it a football field.
4. "Evening Classes": Are you kidding? There are plenty of facilities/areas on campus now for that. Calling them "classes" is a ruse. And having them end at 9:15 simply means more noise, squealing tires. The 1-unit PE requirement does not justify what you're calling evening "classes".
5. Renting out the field is, in my opinion, your main reason for building it. For what? Concerts? (Here comes the alcohol!) So, you using our tax money as a way for FC to make money. That is unethical and thoughtless.

You will be hearing, I'm certain, from many people who live in this area. We've lived here since 1972 (46 years), raised our children here and enjoyed the ambiance around us. Now with this proposed "field", that is all going to change. With two other stadiums in Fullerton this project is completely uncalled for. Shame on you for even proposing it.



Fred Lentz

TEAM  
USA

Mr. Fred Lentz  
413 Dorothy Dr.  
Fullerton, CA 92831-1802

SANTA ANA, CA 926

02 MAY 2018 PM 3 L

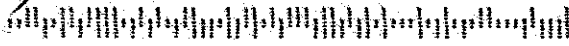


ANAHEIM CAMPUS  
FACILITIES H&G

2018 MAY -4 AM 9:08

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCED  
1830 W. Romneya Drive  
Anaheim, CA 92801

92801-182373



April 9, 2018

North Orange County Community College District  
Attn: Mr. Richard Williams  
1830A West Romneya Drive  
Anaheim, California 92801-1819

Mr. Richard Williams

We are responding to your letter dated April 9, 2018, we have been residents here on Nutwood since 1971, we are not an agency, just hard working Americans who pay our taxes take care of our families, serve our country and hope to live in a peaceful and safe neighborhood. Peaceful and safe was the reason we chose this neighborhood in 1971. Now you and your colleagues are bound and determined to insure that we have NO PEACE OR SAFETY IN OUR NEIGHBORHOOD. We are retired and believe we are entitled to a peaceful neighborhood. We worked and paid taxes MANY years, my wife, Reba was an accountant for Beckman Coulter and I was a tooling engineer at Rockwell (now Boeing).

We submitted a letter on January 24 that was taken with others to the State Chancellor office regarding this new stadium. Funny you do not refer to it as a stadium in your communication. Got news for you, WE ARE NOT STUPID!!

Do you and your colleagues pushing this project live in this neighborhood? Of course you DO NOT. What do you care? NOT AT ALL. You won't have to put up with more traffic, noise and whatever kinds of unsavory people that may come here as a result. SHAME ON YOU. HOW DARE YOU.

Please feel free to contact us, we may not be an agency, but we are American citizens who VOTE.

David and Reba Lewis

  
1025 Nutwood Ave  
Fullerton, CA 92831  
714-870-5357

Enclosure: Copy of our January 24 letter

JANUARY 24, 2018

NOCCC BOARD

TO WHOM IT MAY CONCERN:

We live on Nutwood just off of Raymond. We have been here since June of 1971. We bought here because the neighborhood is safe and tranquil. We are very upset and concerned about the possibility of another stadium at the Junior College. The noise generated from that stadium would be unbearable for the people living on Princeton Circle West and also unbearable for the rest of us living in the vicinity. People pushing for this stadium, of course do NOT live in the area. How dare they be so cruel and mean. They obviously do not care about us fellow human beings. We challenge them to live in our neighborhood and then push for this stadium. **OF COURSE THEY WILL NOT. MEAN MEAN MEAN**

REALLY, the high school stadium has been recently renovated, why do we need to waste more of our tax dollars on another stadium????????? Enough of our tax dollars was spent on that grand renovation. The junior college can use that one and the one at CSUF. You people do not have a right to use our tax dollars in a wasteful manner as this most certainly would be. How dare you to even propose another stadium so close to the one available. More waste of our tax dollars. Do you not know that most of us have to work for the money that you so flagrantly take for granted and want to use so wastefully. Well, do know that money does NOT fall from the trees. We work for it, pay our taxes and expect our elected officials to spend it wisely. **THIS CERTAINLY IS NOT A WISE EXPENDITURE.**

David and Reba Lewis

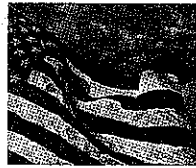
1025 Nutwood Ave



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CA 92705  
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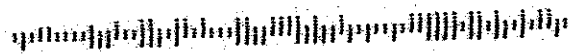
A47 180330 185522



FOREVER

**North Orange County Community College District**  
**Attn: Mr. Richard Williams**  
**1830A West Romneya Drive**  
**Anaheim, California 92801-1819**

102375





April 30, 2018

North Orange County Community College District

Attn: Mr. Richard Williams

1830A West Romney Drive

Anaheim, California 92801-1819

Mr. Richard Williams

We have been residents here on Nutwood since 1971, we are not an agency, just hard working Americans who pay our taxes take care of our families, serve our country and hope to live in a peaceful and safe neighborhood. Peaceful and safe was the reason we chose this neighborhood in 1971. Now you and your colleagues are bound and determined to insure that we have NO PEACE OR SAFETY IN OUR NEIGHBORHOOD. We are retired and believe we are entitled to a peaceful neighborhood. We worked and paid taxes MANY years, my wife, Reba was an accountant for Beckman Coulter and I was a tooling engineer at Rockwell (now Boeing).

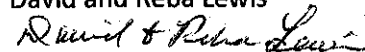
The following are all valid reasons why this Fullerton College Stadium project should never be completed.

- a. All kinds of trash would be left in our yards and street
- b. Noise of cars and trucks racing up and down our streets, alarms and people at the **STADIUM**
- c. Vandalism, unsavory people in area creating an unsafe area in our neighborhood.
- d. Drunkenness and the fifth resulting from the drunkenness.
- e. Lighting from the stadium, yes the STADIUM would be very intrusive to our peace in our home.
- f. Traffic congestion on our local streets would be horrible and NOT ACCEPTABLE.
- g. Lewd conduct would not be acceptable; we have a nice neighborhood and would like to keep it.
- h. Illegal or unlicensed street vendors no matter what they may be selling. NOT ACCEPTABLE
- i. Increased overtime for Fullerton Police
- j. Outside rentals 7 days/nights per week from 6 a.m. to 10 p.m.

Our tax dollars were used to renovate the High School stadium. It's a block away for God's sake they can use it or Cal State Fullerton. You people have no right to use our tax dollars so wastefully. We worked and paid taxes all these years and every right to reject such a wasteful use of our tax dollars.

**Do you and your colleagues pushing this project live in this neighborhood? Of course you DO NOT. What do you care? NOT AT ALL. You won't have to put up with more traffic, noise and whatever kinds of unsavory people that may come here as a result. SHAME ON YOU. HOW DARE YOU.**

David and Reba Lewis



1025 Nutwood Ave

Fullerton, CA 92831

714-870-5357

David And Reba Lewis  
1025 Nutwood Ave  
Fullerton CA 92831-3331

SANTA ANA  
CA 926  
30 APR '18  
PM 10 L



ANAHEIM CAMPU  
FACILITIES

2018 MAY -3 AM 9:24

**North Orange County Community College District**  
**Attn: Mr. Richard Williams**  
**1830A West Romneya Drive**  
**Anaheim, California 92801-1819**

92801

MAY 4, 2018

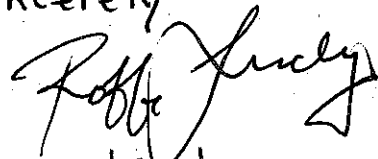
TO WHOM IT CONCERNS,

MY NAME IS ROBBE LINDSAY AND I ATTENDED FULLERTON COLLEGE IN 1983 to 1985, MY FATHER PLAYED FOOTBALL FOR COACH SHERBECK IN THE LATE 50'S FOR MISSOULA COUNTY HIGH SCHOOL. I TOOK MY FATHER'S ADVICE (FOR ONCE IN MY LIFE) AND SOUGHT OUT COACH SHERBECK AT FULLERTON. I WAS FORTUNATE ENOUGH TO WIN A NATIONAL CHAMPIONSHIP AND WALK AWAY WITH A COLLEGE SCHOLARSHIP.

IT WAS, FULLERTON COLLEGE, THAT IS, AND OL' COACH AND ALL THE OTHER HORNETS THAT MADE ME WHAT I AM TODAY, I LEFT A LOT ON THAT PRACTICE FIELD AND WOULD LIKE NOTHING MORE THAN TO SEE IT TURNED INTO A STADIUM. AS FAR AS I AM CONCERNED, THAT IS HALLOWED GROUND,

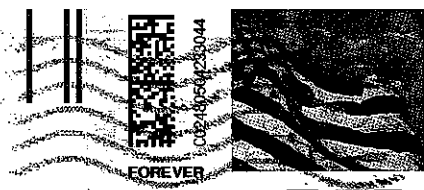
BUILD IT NOW AND IT WILL FOREVER DO GOOD, DAMN THE NEIGH SAYERS.

Sincerely

  
Robbe Lindsay

Robbe Lindsay  
6057 Haugan Drive  
Missoula, MT 59803

MISSOULA MT 59803  
01 MAY 2018 PM 1 L

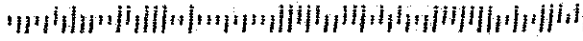


ANAHEIM CAMPUS  
FACILITIES H.E.G.

2018 MAY 10 AM 8:42

TO: North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, CA 92801

9280181833 C023



Laura Gallagher Lopez  
175 Hillcrest Lane  
Fullerton, CA 92832

April 30, 2018

Richard Williams  
NOCCCD  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Re: Sherbeck Field

Dear Mr. Williams:

I am writing in response to your letter dated April 9, 2018, requesting my view of the scope of the Sherbeck Field Improvements as a resident living in the surrounding neighborhood. I truly hope you take my opinion, as well as those of my neighbors, into serious consideration. First and foremost, I am not in support of the expansion of Sherbeck Field for competitive use and feel it is not necessary for the student population at Fullerton College. I believe the effort that would be made in the proposed expansion and improvements would result in an unnecessary and redundant sports field when the existing facility already supports the school population. It would seem to be wasted money that could be better spent elsewhere, especially in light of the fact that there are two other existing sports facility alternatives: Fullerton High School Stadium on Berkeley and Lemon, and CSUF Titan Stadium, nearby.

The proposed expansion for renting out the stadium for competitive use (for profit?) is asking too much of the surrounding neighborhood. I am concerned about the additional traffic and parking into the surrounding area. Morning weekday traffic is already so bad from Fullerton College students/staff that on many weekday mornings, it is backed up on Lemon, north of Berkeley, toward the crest of the hill at Hillcrest Park. It makes it very difficult to get out of my neighborhood at Hillcrest Drive. We requested a "do not block" on Lemon at Hillcrest Drive from the City of Fullerton and it still gets blocked. In addition, when making a left hand turn onto Lemon from Hillcrest Drive, there is zero visibility in either direction and it is very dangerous as you have to inch out until you're in the lane until you can see the traffic. This situation needs to be remedied and anything that adds to the already bad traffic situation (be it construction related or additional traffic from attendees) is of major concern from a safety and quality of life standpoint.

I am also concerned about the light pollution from the lighting proposed at Sherbeck field, and I am concerned about additional noise from the new sound system. I am concerned about the additional parking that will flood our neighborhoods and the trash that will be left behind. From a realistic standpoint, I don't think you will be able to mitigate those concerns as nothing seems to be done about them from other large events such as graduations. And I am concerned about all of the other disturbances that come with a large construction project such as this including additional congestion in an already congested area, pollution, dirt, noise, aesthetics, etc. It was not that long ago that you finished the improvements at the stadium on Lemon and Berkeley. All of these things affect the quality of life living in this area. Our neighborhoods need a break.

Sincerely,

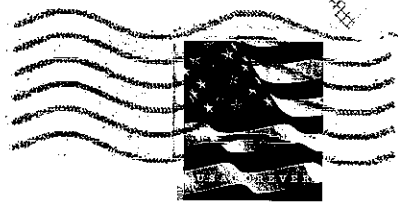
A handwritten signature in black ink that reads "Laura Gallagher Lopez". The signature is fluid and cursive, with the first name "Laura" being the most prominent.

Laura Gallagher Lopez

Laura Gallagher  
175 Hillcrest Ln.  
Fullerton, CA 92832

SANTA ANA CA 926

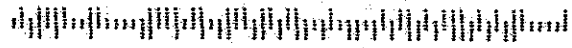
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2018 MAY -3 AM 8:54  
FACILITIES M & O

Richard Williams  
NOCCCD  
1830A W. Romneya Dr.  
Anaheim, CA 92801-1819

92801-182373



April 25, 2018

North Orange County Community College District  
Attn: Mr. Richard Williams  
Director, Facilities Planning & Construction  
1830A West Romney Drive  
Anaheim, California 92801-1819

Subject: Proposed New Stadium Development, Fullerton Community College

Dear Mr. Williams:

We are residents at 508 Princeton Circle West in Fullerton, living one street east of Berkeley Ave. across from the Fullerton Community College and the current athletic tract and physical education facilities along Berkeley Ave. We are opposed to the further development of this stadium complex for the following reasons.

The Fullerton High School Stadium was recently upgraded to near professional caliber facilities, if not at that level. Our tax dollars are at stake here and many hundreds of thousands, if not millions, of dollars were spent to create this quality stadium directly across the street from the college. I happen to know that the college can share this stadium during the regular season, with minor adjustments or improvements for post-season play if necessary. There is no reason to justify another similar upgraded stadium facility within such close proximity in our community.

Noise levels would rise to offensive levels to adjacent and other local residents across Berkeley Ave. and in the general neighborhood. Speaker systems project voice to a level that cannot be contained from the neighborhood. There are other sounds projected, from bands and other music, to say nothing of an excited stadium crowd.

Excessive light intensity also will pervade the adjacent neighborhood for extended periods of time. It is our understanding that environmental impact assessments are being conducted, with results being withheld from the general public and residents. Those impact assessments should be revealed to Fullerton residents in full. You should conduct an open and honest environmental assessment, with results published for the community to see and evaluate.

Finally, traffic congestion will increase significantly with the construction of a duplicate stadium. Current parking facilities are surely inadequate as they stand, with our anticipation of the college building more multi-level parking with its impact on Berkeley Ave. and the neighborhood.

Fullerton High School Stadium is satisfactorily isolated from the surrounding community by distance and elevation as well to the local residential areas in the elevated hillside. The stadium at Fullerton College is not, being isolated from residential areas by Berkeley Ave. alone.



Our concerns are justified and should be taken seriously by the North Orange County Community College District. We, not the district board members, are the ones who must live near this facility and deal with the complex issues that face nearby property owners, if this plan should proceed.

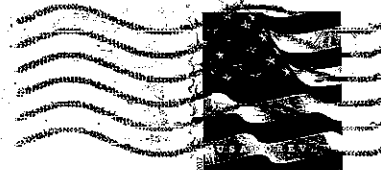
Please listen to your community and their concerns and make the right decision to save wasted taxpayer funds, prevent many issues that are sure to disrupt and agitate adjacent property owners, and to blatantly build a duplicate stadium facility in such close proximity to an existing one. It is not reasonable or prudent to proceed to build this facility in our neighborhood.

Steven D. & Patricia V. Lowry  
508 Princeton Circle West  
Fullerton, CA 92831  
(714) 879-7137  
lowrysd@earthlink.net

Steven D. & Patricia V. Lowry  
508 Princeton Circle West  
Fullerton, CA 92831

SANTA ANA CA 925

24 APR 2018 PM 9 1

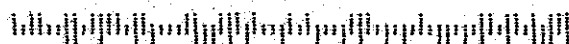


ANAHEIM CAMPUS  
FACILITIES M & B

2018 APR 27 AM 8:47

North Orange County Community College District  
Attn: Mr. Richard Williams  
Director, Facilities Planning & Construction  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



May 6, 2018

Mr. Richard Williams  
District Director, Facilities Planning and Construction  
NOCCCD  
1830 A W. Romneya Drive  
Anaheim, CA 92801

RE: Response to NOP of Draft EIR for Fullerton College Sherbeck Field Improvements.

Dear Mr. Williams:

As neighbors at Fullerton College, we have lived in harmony with the school and are willing to support the growth of Fullerton College's athletic department. We are in support of the Fullerton College National Championship football team playing all of their home games on an improved field, which could accommodate all of their 1,600 fans. We are in support of more P.E. classes, so that additional Fullerton College students can receive the education they need in a timely manner.

We have no problem supporting the football team and the physical education department, and we understand that this will require growth.

We are **opposed** to building a venue/stadium with 4,417 seats, which far exceeds the spectator needs of either Fullerton College's athletic department or the school's championship football team. Even with 4,400+ seats, the venue falls approximately 3,000 seats short of 7,200-- the number of seats needed for graduates, family and friends expected once a year at Commencement Ceremonies. The number of proposed seats argument does not stand up to any scrutiny and in fact, no one at the 'information stations' I spoke with at the scoping meeting could answer the 4,400+ seat question satisfactorily.

From the scoping presentation in the campus theatre on May 1st, and all the information gathered over the past years, the community has concluded that there is absolutely no need for more than 1,600 permanent seats. Nor is there a need for a permanent public address system that we have absolutely no way of controlling once it gets installed. P.A. systems should be *rented* for football games and commencement ceremony only. This will help alleviate many neighborhood concerns over stadium noise and sounds, which is our greatest concern and it has not been adequately addressed. How will you mitigate the noise from approximately 4,500 screaming fans?

We have been assured repeatedly that this new stadium will not be for more outside rentals other than who currently rents the field. If that is the case, what is the need for 4,400+ seats? The college has said that the increased number of seats is needed for annual commencement ceremonies, but that argument makes no sense. Graduation is only one day out of the year and requires 7,000+ seats and a P.A. system. Bleacher rentals will still be required regardless, so why not simply rent a suitable venue with the appropriate amount of seats? FUHS for example. I urge you strongly to consider using Fullerton District Stadium at FUHS one block away from Fullerton College, which the school had done until 2016 with no issues. What changed? Why did the college stop using the district stadium? Why has Fullerton College chosen to spend \$67,000 per year (for 3 years straight) on bleacher rentals when they can rent the District Stadium at FUHS one block away for approximately \$5,000-\$7,000? (figures are educated guesses) Cost savings is a primary reason for the Sherbeck Field Improvements project, so please explain the economics behind such decisions.

Permanent seating- We would welcome 1,600 permanent bleacher seats which more than covers any known record of spectator fans ever to attend a game at Fullerton College. Having a limited number of seats that is appropriate for the number of fans would profoundly decrease the negative impacts to the neighborhood and the city in EVERY WAY... That said, 1,600 people descending into a residential neighborhood will still require a sophisticated insulating sound absorbing wall which will buffer the loud noises the venue will still create. We ask that sound insulating walls be priced out, investigated and included as part of the mitigation measures.

If the college truly wants to improve their athletic department, and provide a nice place for their home teams to play home games- we would happily support those efforts, so long as it is put in a permanent and binding contract, that this field will never be used as a profit-making rental facility.

We have heard that multiple high schools are already interested in renting the facility and we can only imagine what other outside groups such as concerts, musicians, festivals, and sporting clubs will also certainly be interested. There is nothing wrong with such events, but they should take place in an open area downtown, or a district that is suitable for such events and is not located in the heart of a residential neighborhood. Sound from the project is the greatest concern for residents followed by excess traffic, light pollution and safety (crime, drunkenness, and proper street access for emergency vehicles)

We understand that certain community groups currently rent the stadium and we are willing to see a limited number of community groups continue renting the facility, but all of that would need to be in writing and all without the use of a permanent public address system. How many days per year will the stadium be

in use by the college? How many days by outside renters and until what time? How many of both the college and outside renters will require a PA sound system or lights? We need these questions answered in detail please.

We would be fine with 12-15 days per year with use of P.A., and absolutely no more. This amount of use is very reasonable. There is absolutely no need for a permanent sound system blasting music and a game announcer for 400-500 fans of a Fullerton College football game. And for goodness sakes- a Press Box? If the only use is in fact for the home team to play home games for the PE Department to have PE classes how is a Press Box needed for any of this?

We feel that the college is being disingenuous by continuing to say that this is only for the use of the school's athletic programs and a few current renters. Anyone with half a brain can see that the college is hoping to make this a steady income stream via rentals and that is not appropriate, nor is it sustainable for a residential community and it is not something that the community or the city itself will support.

**We Will Support:**

**\*Alternate Venues** (FUHS, CSUF) being thoroughly discussed and looked at in detail before any building commences at Sherbeck Field. We feel that there are viable NO BUILD alternatives to a stadium that are both fiscally and environmentally more responsible and should be considered first for the needs of the college.

**\*Smaller Project:** Seating for no more than 1600 spectators with no permanent public address system and fewer lights with a very limited and strict field use policy. Grandfather in who rents the stadium now. No new renters.

I look forward to reading the Draft EIR and participating more in this process.

Sincerely,

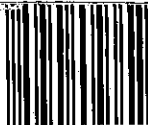
A handwritten signature in black ink that reads "Tanya McCrory". The signature is fluid and cursive, with the first name "Tanya" written in a larger, more prominent script than the last name "McCrory".

Tanya McCrory  
501 Princeton Circle W  
Fullerton, CA 92831  
310-406-4455

D. Planchon  
501 Princeton Cir W.  
Fullerton CA, 92831



1000



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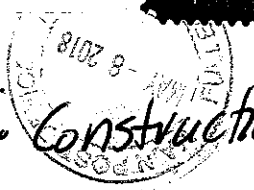
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OF THE RETURN ADDRESS. FOLD AT DOTTED LINE

**CERTIFIED MAIL®**



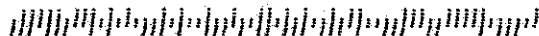
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Mr. Richard Williams  
District Director, Facilities Planning: Construction  
NOCCLD  
1830 W. Romneya Drive Suite #A  
Anaheim, CA 92801



MAY 14 AM 8:53  
FACILITIES MGR

92801\$1823 C023



May 6, 2018

Mr. Richard Williams  
Director, Facilities Planning and Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801

Dear Sir,

As long time residents of Fullerton we have seen first hand how the recent expansions at Fullerton College have negatively impacted surrounding neighborhoods. We oppose the construction of the proposed stadium at Sherbeck Field for the following reasons.

1. Current use of athletic facilities by school and outside entities cause parking, trash, noise and pedestrian problems. These problems extend several blocks into residential streets. The proposed stadium will worsen these problems and extend the hours of the intrusion.
2. Fullerton College's stated reasons for needing the stadium are invalid. FC athletic programs have been successful with current facilities. They have not developed a fan base to warrant a 5,000 seat stadium for any athletic event. Viable alternative sites exist nearby, (one is ¼ mile away and newly renovated).
3. Physical Education classes have been on the schedule for decades, making use of the 2 gyms, dance studios, pool and tennis courts. A stadium would simply not provide students with any essential opportunities.
4. Property values in surrounding neighborhoods are predicted to decrease by ten to fifteen percent due to the negative impact of the stadium. This is a minimum loss of \$65,000 on the resale value of our home. This impact comes in the form of noise pollution, the eyesore and light pollution from light towers, as well as increased traffic and trash.
5. This stadium will by Fullerton College's own admission be rented to outside entities. In addition to the above stated environmental impact, this stadium will be constructed using bond money not intended for this purpose, granted by residents that oppose the project.

For these reasons and several others we oppose the construction of the proposed stadium at Sherbeck Field. It is not necessary, will have a negative environmental impact, and is an undue burden on the surrounding residents.

Sincerely,

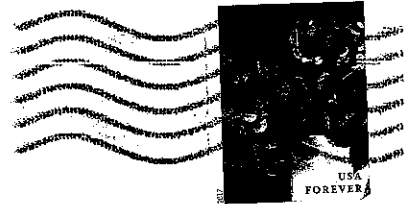
William and Elaine Miller  
512 Princeton Circle East  
Fullerton, CA 92831  
(714) 879-2877



Miller  
512 Princeton Cir East  
Fullerton, CA. 92831

SANTA ANA, CA 926

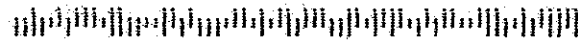
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ANAHEIM CAMPUS  
FACILITIES MFG CO  
2018 MAY 10 AM 8:41

Mr. Richard Williams  
Director, Facilities Planning and Construction  
NOCED  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



May 2, 2018

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romney Drive  
Anaheim, CA 92801-1819

Mr. Williams,

We are opposed to the building of the Fullerton College Stadium. There are already two stadiums in Fullerton and the one being considered for building is just around the corner from the Fullerton High School's stadium. Why can't the college use FHS stadium? It was just renovated.

Our home is approximately a half mile from the Fullerton College track and field and if that is to be made into a stadium we feel that would put undue strain on this neighborhood. Lights, loudspeakers, noise and trash, vandalism, security and more traffic. Raymond Elementary is in this community so there are a lot of children in this track of homes next to your planned stadium. The extra traffic in this area could put them at risk.

We urge you to use the Fullerton High School or The CSU Fullerton College Stadiums and not build a third unnecessary stadium.

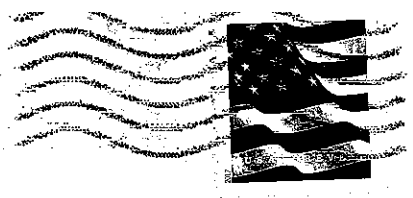


Kelsey Mori  
542 Stanford Ave.  
Fullerton, CA 92831

1012xy  
42 Stanford Ave  
Fullerton, CA 92831

SANTA ANA CA 926

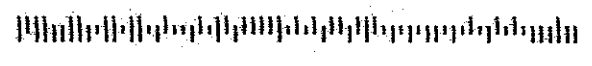
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ANAHEIM CAMPUS  
FACILITIES M&O  
2018 MAY -7 AM 8:55

Mr. Richard Williams  
Director, Facilities Planning &  
Construction, NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



May 2, 2018

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romney Drive  
Anaheim, CA 92801-1819

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We urge you to use the Fullerton High School or The CSU Fullerton College Stadiums and not build a third unnecessary stadium.



Sherrie Mori  
542 Stanford Ave.  
Fullerton, CA 92831

Sherrie Mori  
542 Stanford Ave  
Fullerton CA 92831

ANALYSIS CAMPUS  
FACILITIES H & O

2018 MAY -4 AM 9:08

SANTA ANA CA 926

02 MAY 2018 PM 10 L



Mr. Richard Williams  
Director, Facilities Planning &  
Construction, NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



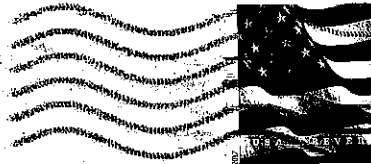
Michael Mori  
542 Stanford Ave  
Fullerton CA 92831

ANALYSIS CAMPUS  
FACILITIES H & O

2018 MAY -4 AM 9:08

SANTA ANA CA 926

02 MAY 2018 PM 7 L



Mr. Richard Williams  
Director, Facilities Planning &  
Construction, NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

May 2, 2018

Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

Mr. Williams,

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We urge you to use the Fullerton High School or The CSU Fullerton College Stadiums and not build a third unnecessary stadium.

A handwritten signature in black ink, appearing to read "Michael Mori", written in a cursive style.

Michael Mori  
542 Stanford Ave.  
Fullerton, CA 92831

May 6, 2018

Dear Mr. Williams,

I am writing to you in order to voice my opposition to the proposed developments at Sherbeck field. I am opposed to the project for many reasons; including noise and light pollution, traffic congestion, trash and the proximity to a residential area.

Of great concern to me is the inclusion of a sound system and press box. From my residence at 601 North Yale Avenue, I am able to hear noise from the farmers market in downtown Fullerton. Also, the new sound system at the high school disturbs me while I am in my yard. Because of this, I am well aware that a sound system so much closer to my house will be nothing short of loud. I would like to know:

1. How are you going to measure the sound's impact on the residence? (are you measuring the sound at different times during the year/day to account for busier times of year/day)?
2. How do you propose to include the sound of bands, cars and the loud speaker cumulatively?
3. How are you going to account for sound coming from both the college and the high school at the same time ( they will undoubtedly have games that overlap)?
4. Are you taking into account that the homes close to the stadium are older homes that do not have insulation, double pane windows or air conditioners. ( I do not have an air conditioner and open my windows)?
5. Are you considering the affect of sound on people when they are outside in their yards?

Increased traffic will also create a negative impact on the surrounding areas. Berkeley Avenue is a cut through from Harbor to Chapman and is already highly used. Also, Dorothy is a cut through from St. College to Berkeley. During school, these streets get a lot of use. I would like to know:

1. How are you going to measure the proposed increase in traffic ?( I was told that Yorba Linda High School is being used as a data collection site. I do not agree that this is a fair comparison as Y.L. high school does not sit on a cut through street like Berkeley and is not in close proximity to other schools that also impact traffic such as Troy, St. Julianas, Fullerton high school )
2. How are you going to address the issue of traffic flow. Turning left onto Brookdale going south on Berkeley, drivers already compete for the center lane with drivers turning into the school going north on Berkeley?
3. How will multiple new lights on Lemon NOT create gridlock? Everyday I drive to the La Puente are on Fullerton Road where there is heavy traffic and multiple lights? Traffic doesn't move smoothly! There are too many cars and nowhere to go.
4. How are going to keep more cars out of our neighborhoods where children play?
5. How are you going to keep increased car pollution from affecting me? I don't want to live with a constant stream of cars passing my house on the way to a game?
6. Pollution experts state that you should live a certain distance from a freeway in order not to be adversely affected by pollution. Are you measuring the increase in pollution? And how?



The light used to illuminate the field shouldn't be near a residential area. I feel strongly that bright lights have a negative human health impact. There are studies coming out about the increased risk of diabetes, impact on melatonin...

\*Are these lights going to be LED lights?

\* If so, how are you going to address the health issues coming to light about this type of lighting

*A study from Harvard found a greater risk of breast cancer in women who live in neighborhoods that have higher levels of outdoor light during the night. The higher the light level, the higher the risk.*

*"There's a lot of potential breast cancer," Benal said.*

Trash is an ever- increasing problem in our cities. Currently, the trash left behind by students that park along Berkeley is disturbing. The trash left behind in the stadium by athletes is disturbing. The fact that the school does not have a recycling system in 2018 is appalling. I know because I pick up trash when I walk there. There aren't any dedicated areas for recyclables or any kind of a system that I can see. The school should be a leader and innovator in this area. In my opinion, recycling is a moral obligation to our planet (and ourselves) and not a revenue generator so my conclusion is that it is not important to the school. Therefore, I can only conclude that the school will not take the trash issue seriously. I would like to know however

\*How will the increase in trash be addressed?

\*How will it be different from what is currently being done?

\*Will you have a recycling system?

\*Who is going to take responsibility for the trash left in my yard, on my fence and even thrown into my backyard?

I am opposed to the development for the reasons stated and feel strongly that the 2 years that an athlete is at the college does not compare to the lifetime that residents are in their homes. There are options for the games ( using the new field at the high school ). The athletes have shown that not having a stadium does not impact their ability to win games. **However this stadium will decrease my home's value and my quality of life.** I am in opposition to the stadium at Sherbeck Field.

Regards,

Suzanne Muhaidly

Fullerton Resident

Suzanne Muhaidly  
601 N. Yale Ave.  
Fullerton, CA 92831

SANTA ANA  
CA 926  
07 MAY '18  
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FOREVER

ANAHEIM CAMPUS  
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2018 MAY 10 AM 8:42

Mr. Richard Williams

Director, Facilities Planning & Construction

NOCCCD

1830 A West Romneya Drive

Anaheim, CA

92801-1819

92801-182373



**Anne S. Murphy**  
**505 Princeton Circle West**  
**Fullerton, CA 92831**  
**Anne.murphy@asmnet.com**  
**Tel. 714-270-7379**

April 11, 2018

Mr. Richard Williams  
District Director, Facilities Planning & Construction  
North Orange County Community College District  
1830A West Romney Drive  
Anaheim, CA 92801-1819

Mr. Williams,

This letter is in response to your 'Notice of Preparation of a Draft of Environmental Impact Report for the Fullerton College Sherbeck Field Improvements Project'.

**I am OPPOSED to this project moving forward.**

How are you going to mitigate the following issues?

1. Generation of trash of all kinds and types
2. Noise abatement – cars, trucks, street racing, car security alarms, and people
3. Vandalism of private (and commercial) property including graffiti, theft and general mischief
4. Drunkenness – this includes liquor trash and vomit
5. Illegal Parking
6. Parking for Profit
7. Lighting
8. Traffic congestion before and after the events
9. Lewd conduct
10. Illegal or unlicensed street vendors, whether they are selling food or paraphernalia
11. Animal defecation
12. Increased overtime for Fullerton Police Department

The effect and consequences are well documented of a stadium as proposed would reduce the values of properties within a one mile radius of a stadium. I refer you to the following articles:

<https://news.stanford.edu/2015/07/30/stadium-economics-noll-073015/>

<https://research.stlouisfed.org/publications/page1-econ/2017-05-01/the-economics-of-subsidizing-sports-stadiums/>

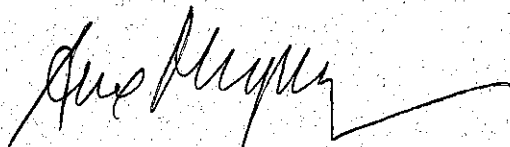
<https://www.brookings.edu/articles/sports-jobs-taxes-are-new-stadiums-worth-the-cost/>

<https://www.dailykos.com/story/2015/2/20/1365048/-Sports-Stadiums-Have-No-Impact-on-Municipal-Economies-So-Why-is-it-We-Still-Subsidize-the-NFL>

I offer a solution: the newly renovated Fullerton High School stadium, located adjacent to the Fullerton College campus.

I look forward to participating in this process.

Sincerely,  
Anne S. Murphy  
(Property Owner)

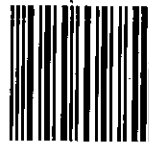


**anne murphy**  
505 PRINCETON CIRCLE W  
FULLERTON, CA  
92831

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CA 926  
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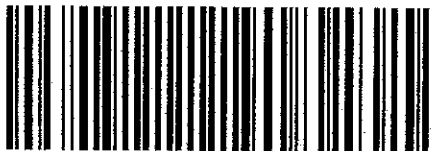


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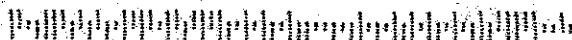
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Mr. Richard Williams  
District Director, Facilities Planning & Construction  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

92801-182373



Mr. Williams,

My views regarding the scope and content of the environmental information to be included in the EIR for the proposed Fullerton College Sherbeck Field Improvement project are as follows:

**A) Noise levels (Pages, 17 & 78)** - A proposed sound system includes 12 speaker arrays, 5 (36-foot high) on the north/visitors side and 7 (33-foot high) on the south/home side. The speakers are to be used for athletic events only (campus sponsored and rental) which are scheduled to occur at various lengths and times during the days and nights 7-days a week.

The EIR infers that the only standard that will be used to measure "excess" noise levels by the new sound system will be Interior and Exterior Noise Standards established by the City of Fullerton. If said standards were used for the new sound system in the Joint City Stadium at Fullerton High School approximately one-quarter of the a mile to west, then I say the proposed standards to be used at Sherbeck Field are not restrictive enough. This is said because the broadcasts from said stadium are loud enough to hear clearly approximately 0.25 to 0.5 miles away in predominately single family residential developments to the northeast/north/northwest. This is likely due in part to the upsloping hillside topography of the properties to the north across Berkeley. , i.e., sound travels up!

Given that this element applies to Sherbeck Field with additional single family residential tracks lying roughly 100-feet to the east a more than restrictive and/or excess noise standard measurement should be applied to Sherbeck Field's sound system when also coupled with the following attendee information. Soccer and track/field events are attracting and/or projected to have only a small number of attendees per competitive event (approximately 100 attracted/100 to 200 projected) with the Commencement Ceremony (1 time event each year - 7,200 attracted/7,200 projected) and college football games (7 possible games - 350 to 1,600 attracted/1,600 to 2,000 projected) having higher attendee numbers.

Therefore, after considering these two elements alone it would strongly appear as if the sound system as described in the initial study is excessive (over serving the number of attendees) and will easily bleed well into the neighboring single residential developments to the north and east.

As such, and noting some of the proposed competitive events could extend into the late afternoon/evening hours (Pages 17 and 18), **I propose that only the speaker standards on the north/visitor side of the field be built and that their sound arrays be specifically directed ground ward and face to the southwest. Given the highlighted elements said proposal would strongly appear to be more than sufficient to serve the attendees at each of each of the competitive events (Pages 18 and 19) while at the same time maximally retaining the stadium's internal noise to the campus where it belongs thereby limiting the detrimental impact to the appeal and values to the campuses adjacent properties. Addresses issues on Pages 78 and 79).**

B) **Lighting (Pages 16 and 17)** - other than possible use for the campuses football team lighting does not appear to be required. Hours of operation can be scaled back/limited to 5 PM for those scheduled beyond this time (as late as 8:00 P.M (7) days a week essentially to rental tenants [Page 19] as well as proposed Academic instruction (week days), appear are by their nature optional and can be easily eliminated, i.e., on a campus that is over used (high density use compared to other campuses in the district) more use even in the evenings and close other proximity of alternative negate the need to offer Academic beyond that already offered at the campus. **As such, by limiting the hours and stadium use to essentially day light hours appears reasonable and would greatly limit the negative affects to a significantly lesser number of days/nights.** Thereby, greatly diminishing the potential light pollution that would result from the proposed lighting plan in conjunction with the proposed Sherbeck Field schedule and programming. Given that the immediate area, particularly on the north side of Berkeley Avenue also contends with the light pollution resulting from the use of the Fullerton All city Stadium (another element to consider in the lighting use at the Sherbeck Field), would limit the potential significant negative affects to the appeal and values of the surrounding residential properties to the campus. **Addresses on Pages 41 and 42.**

C) **Bleacher size and Press Box (Pages 15 and 17)** - Proposed bleacher size and press box appears to be excessive and not repectively for the various competitive non-rental and rental events after considering the following. The College Football team which is only projected to have a maximum of 3,000 attendees viewing 2 possible playoff games and only a maximum of 1,000 attendees viewing 5 (five) regular season games. All others are projected to have only a maximum of 200 or less attendees for each of their individual events. Representing at best a projected occupancy rate of 68% to 23% for the College Football games (playoff and regular season, respectively) and at best 5% for all other events at the proposed permanent seating capacity. Given this information it would seem as if the proposed project's 4,417 permanent seating capacity could be easily scaled back to roughly 3,200 (70%) or 2,200 (50%) given that projected numbers are typically optimistic and rarely ever achieved and that the proposed press box facility is not cost effective at all (needed at best 7 times out of 365 days).

We recognize the College is proposing to continue to use the facility for Commencement Ceremonies which garnered 7,200 attendees in the most recent year with projections at 7,500 attendees in future years. However, the ceremonies occur only once a year for a little more than half a day in late May or early June on a Saturday. Because the preceding suggests sufficient flexibility in scheduling where an alternative site could be found, likely rented at a significantly lesser amount than the cost of installation of temporary seating, and Sherbeck Field is not "holy ground" where the ceremony has to take place at said facility. It is therefore suggested the college strongly pursue a one day rental of the Fullerton High School stadium facility. It is close by, has sufficient seating to accommodate the requirements of the College, and they would likely have one day available during the noted extended late May/early June time frame (Page 5). Information is not available to say that the commencement date has to be on a Saturday. Therefore, absent a concrete reason why, the college should show flexibility and think outside the box on this issue in-order to avoid the cost of installing temporary seating at Sherbeck Field.

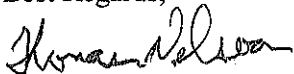
The preceding **addresses issues on Page 42** of the Initial Study for the Sherbeck Field Improvement project. Suggestions/solutions have been provided to support downsizing the scope/number of permanent seating at the proposed Sherbeck Field project which seem reasonable, more financially practical, and also result in less negative visual appeal/value to the adjacent residential properties to the east and north

across Berkeley Avenue. I hope the preceding will be reviewed and considered by the appropriate parties within the EIR.

The preceding are my primary concerns with my proposed solutions pertaining to the Proposed Fullerton College Sherbeck Field Improvement Project delineated within the initial EIR study, dated April 2018, and completed by Dudek. I hope the preceding will be reviewed and strongly considered for adoption by the appropriate agencies. The proposals I feel are not ideal solutions but recognize that some give and take must be part of the process from all parties including the College. Especially if the College want to be good neighbors and further noting that it is apparent that the EIR process is being completed because the neighboring property owners best solution is to use the recently renovated All City Stadium essentially across the street on the Fullerton High School Campus. As such, and because the adjacent property owners to the east and north are already dealing with noise, lighting, and traffic issues from other sporting events on the adjacent College and High School campus (girls soft ball field, boys high school baseball field, and the All City Stadium) through-out the extended daylight and some evening hours during each week, it is only right that the College accept a project of lesser scope than that represented by the present planned renovation improvement plan.

Due to the proposed development scope the neighboring residents have a great deal at stake given that the potential negative effects of the project would viewed as a compounding or a "piling-it-on" of all the less than desirable issues associated with the varied sport fields/activities in the immediate area. A such, and because property values of residences are generally found to be the owner's greatest investment/since of security **I ask that the EIR study not consider the various elements associated with the Sherbeck Field renovation in isolation but in total with the elements associated with the other aforementioned sporting activities at the College and adjacent high school.** Since said elements are common to each, a tempering of the conclusions relating to the proposed Sherbeck field's improvements should be considered, noted, and made within the EIR report. When taken as a whole it is our opinion that it becomes more evident that the proposed Sherbeck's Field improvements are aggressive and not appropriate nor are they physically or economically beneficial to the surrounding property uses. Therefore, they must be modified/down scaled.

Best Regards,

A handwritten signature in black ink, appearing to read "Thomas Nelson", written in a cursive style.

Thomas Nelson



92801-182373

ANAHIM CAIPUS  
FACILITIES & O

2018 APR 23 AM 8:50

Att. Richard Williams  
Anaheim, California 92801-1819  
18304 W. Romero Drive  
No. Orange County Community College District

19 APR 2018 PM 10 L

SANTA ANA, CA 92705

7. H. Johnson  
416 E. Dorothy Dr.  
Fullerton, CA 92831

## Rachel Struglia

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**From:** Richard Williams <rwilliams@nocccd.edu>  
**Sent:** Tuesday, May 8, 2018 5:55 PM  
**To:** Rachel Struglia; Gregory Schulz; Rod Garcia; Oscar Saghie; Fred Williams  
**Cc:** Kimberly Kimble  
**Subject:** Fwd: Response to NOP for Sherbeck Field Improvements-

Please find below email message from Fullerton resident, Damion Lloyd regarding the initial study for Sherbeck Field

---

From: Damion Lloyd <damion@damionlloyd.com>  
Sent: Tuesday, May 8, 2018 5:30 PM  
Subject: Response to NOP for Sherbeck Field Improvements-  
To: Richard Williams <rwilliams@nocccd.edu>

My wife and I both sent certified copies of our letters today in response to the NOP. They are postmarked with today's date, but I wanted you to have an additional copy of my letter.

May 6, 2018

Mr. Richard Williams

District Director, Facilities Planning and Construction

NOCCCD

1830 A W. Romneya Drive

Anaheim, CA 92801

### **RE: Response to NOP and OPPOSITON TO SHERBECK FIELD IMPROVEMENTS; Comments for Inclusion in Draft EIR**

Dear Mr. Williams:

My name is Damion Planchon, and I am OPPOSED to the Sherbeck Field Improvements project (current design) for numerous reasons. For these reasons, I feel very strongly that NO BUILD is the best option and will give the college the least amount of objection. It makes the most sense. If there wasn't another very viable stadium alternative 1,000' away from the college campus, we could better understand the need for the project.

As a neighbor of Fullerton College and homeowner of more than 12 years, I have always supported the school and have even had 3 interns from your photography program intern for my studio. Two of those interns became semi-permanent members of my studio and work with me to this very day. Additionally, it's my pleasure to serve on Fullerton College's Photography Department Advisory Committee, headed by Melody LaMontia. I care about the school and its students. I also care very much about my cherished and quiet neighborhood and would appreciate if you could thoroughly address the following concerns:

**Seating:** Please explain how 4,417 permanent bleacher seats will save the college money. Renting FUHS stadium (as the college had done until 2016) is *a fraction* of the cost of building a stadium at Sherbeck Field. Even if the college installs 4,400 seats, an additional 3,000 bleacher seats will still need to be rented for Commencement ceremonies every single year. Fullerton College football games draw anywhere from 350-1600 fans according to the IS. The number of bleacher seats proposed simply does not make sense for the college's use unless it is planning on renting to outside teams and entities which will draw a high number of spectators regularly. This is our main objection to the project- noise. How will you mitigate the noise from 4,500 screaming and cheering fans at an exciting sporting contest with a 12 loudspeaker Public Address system blaring at game volume? If the college is being truthful about their desires for a nice field just to play their home football games, we neighbors would support this project wholeheartedly. The problems begin when you look at the proposed rental schedule and see that the field is available for rent from 6 a.m. to 8 p.m. M-F and 8 a.m. to 8 p.m. Sat-Sun. Football season sees the field rented/used until 10 p.m. This is hardly a project only for the college. The high number of seats points toward maximizing attendance and renting the facility out as much as possible. This is clearly going to be a profit making endeavor for the college, and we have genuine concerns with the college's disregard for the neighbors legitimate worries over the problems a stadium will cause.

**Light Pollution:** How do you propose to mitigate the new source of substantial light and glare, which could adversely affect nighttime views in the area? I'm fully aware of the new focused and shielded LED technology used to minimize direct glare, but how will you mitigate the 80,000 watts of light (skyglow) that the lighted field itself will produce?

**Safety:** The streets are narrow in the neighborhood directly across Berkeley from the proposed stadium project. Due to long exit times leaving a parking structure after an event (even if allowed to park for free during games), students and fans will choose to instead park in the adjacent neighborhoods and walk to the field, as it is simply more convenient for egress after events. Our concern for safety cannot be ignored. If a full event is happening at Sherbeck Stadium (and God forbid simultaneous events at FUHS and FC) and fans' cars are parked on both sides of Princeton Circle, the street is even more narrow and becomes one-way only. Emergency vehicles (such as fire trucks and ambulances) would find it difficult, if not impossible to navigate the neighborhood this way and thus increase emergency response times unnecessarily. This issue *must* be adequately addressed in the Draft EIR.

**Noise:** Public Address System (permanent and outside rentals). The project proposes to install 12 loudspeaker arrays between 33'-36' in height. The college claims that the P.A. will only be used for home football games- approximately 5-7 times/year (we could handle this easily) and for athletic competition events only. This is grey area, and completely unknown. How much excessive noise will the neighbors and adjacent neighborhood be subjected to, and for how many hours per day? How many athletic competitions is the college planning on hosting? How many days per year will the sound system be employed? 20 events? 50 events? 100 events? Also, how will you mitigate the noise generated from 4,500 excited sports fans at a full event? How will the school monitor and control the volume from outside rental P.A. systems? Will the Draft EIR analyze the decibel level of the proposed permanent P.A. system and all proposed outside (rental) P.A. systems? Please be specific, as excessive and uncontrollable noise from the project is one of the primary objections we have. To date, we have not seen a single sound study performed for the lead agency NOCCCD. We have witnessed a sound engineer recording sound on Berkeley Ave on the last day of classes Friday, December 15, 2017 at approximately 11:15

a.m on a virtually empty street (we have photos with timestamps to prove this). Is this an appropriate time to be recording sound for such a project?

**Press Box:** The addition of a press box indicates that the field is geared toward outside rentals to large sporting contests drawing thousands of fans. Why would a community college football team with an average regular season attendance of approximately 400-500 spectators need a press box unless the college had big plans for outside rental? This field would indeed be very appealing for private high schools to rent out to play their football games. Please provide evidence on why a community college football team needs a press box.

**Lewd Conduct, Trash:** As much as the college wants to believe fans coming to events at Sherbeck Stadium obey the rules and are good citizens, we who live across the street from the school know how flawed that thinking is. Fullerton College students smoke marijuana and do other drugs, have sexual intercourse, leave fast food wrappers and other refuse on the street, and many just sit in their cars on their phones for long periods of time parked with their cars idling. Imagine 2,000 extra cars (bringing sports fans from all over the Orange County area and beyond) doing this every weekend in your neighborhood in front of your house. How will you mitigate this additional traffic and careless behavior? Please adequately address this in the Draft EIR.

**Student Demand:** Fullerton College currently offers over 100 P.E. courses between the hours of 6:15 a.m. to 7:15 p.m. For the majority of Fullerton College students, only one unit of P.E. is required to graduate with an AA degree or transfer to the CSU system. How does the current schedule of classes not meet this demand? Where is the student demand for more course offerings? Please provide proof of this student demand in the Draft EIR.

**Funding:** The funding for this project has never been clear. Even as early as 18 months ago, Measure J monies were earmarked for this project. Since the field was initially built with taxpayer bond money, please provide the history and timeline of funding and costs associated with what is currently Sherbeck Field (Field House, 400M track, and artificial turf field, professional fees) and the precise source of funding for the proposed improvements, and the project's exact cost.

**A smaller project:** (1,600-2,000 seats maximum) with a very limited (25+ year legally binding) and strict field use policy could help alleviate most of the neighbor concerns, and we'd welcome the opportunity to discuss such matters with a representative from the School District at any time.

Thank you for the opportunity to participate in this process. If you wish to discuss an appropriately sized smaller project, we would welcome those talks at any time.

Sincerely,

Damion Planchon

501 Princeton Circle W

Fullerton, CA 92831

714-873-5547

Damion Lloyd • Photographer

**Damion Lloyd Photography**

714.873.5547

[damion@damionlloyd.com](mailto:damion@damionlloyd.com)

[www.damionlloyd.com](http://www.damionlloyd.com)



NORTH ORANGE COUNTY  
COMMUNITY COLLEGE DISTRICT

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[NOCCCD Email](#)

Laura Richard-Barasch  
221 W. Brookdale Pl.  
Fullerton, CA 92832

May 6, 2018

Dear Mr. Williams

I am writing regarding my concerns about the renovation of Sherbeck Field. I am concerned about the impact of the changes to the field and the impact on the surrounding neighborhoods. The major impact will be a result of increased traffic, light pollution, sound pollution, and safety.

By increasing the capacity and type of uses that the field will have, there will be an increase of traffic. These are my concerns about increased traffic:

- Increased pollution in the area negatively impact the health of residents
- Increased noise due to traffic
- Parking problems. Students already park in the neighborhoods surrounding Fullerton College. This already has increased traffic into residential areas, especially Monday through Thursday. An increase of events/games/use of the stadium across all days of the week will lead to increased traffic and parking in these neighborhoods across all days of the week.
- There is already a problem with litter in the areas that the students park on campus, on Berkley and in the surrounding neighborhoods. More people using the field will lead to more litter.
- The likelihood that the traffic study may not be representative of what traffic would really be like when the field was in full use for the college and for rentals.
- One of the entrances/exits from the field is offset from the intersection of Brookdale and Berkley. Accidents already occur there. Increased traffic to and from the field will increase accidents.
- Using the number of people who attended games at Yorba Linda High School may not be representative of how many people would attend games if there was a stadium at Sherbeck Field. Because the stadium would be on campus, attendance would likely be increased.
- Students frequently jaywalk on Berkley between Hornet and Chapman. Increased traffic will increase the likelihood of accidents between cars and pedestrians.

Questions/considerations for traffic:

- If traffic is studied during the summer session, it will not be representative of what traffic is truly like during fall and spring semesters because of lower summer enrollment.
- If traffic is studied while Fullerton High school is out of session, it will not be representative of what traffic is like during the school year.
- How will they estimate traffic for when the stadium is being rented?

- How are they factoring in the traffic which will occur if FUHS stadium and Sherbeck Field were being used for concurrent events/games?
- What will be done to increase traffic safety along Berkley with increased coming and going from the field area?
- If estimated traffic to games is based on games held 30 minutes away from campus, this may be an underestimate. How is the likelihood of increased numbers of football game attendees because the stadium would be on campus making games easier to attend be factored into the traffic projections?
- How will overflow parking be kept out of the neighborhoods surrounding the college?
- How will pedestrians crossing Berkley between Hornet and Chapman be protected from increased traffic?
- What will be done about the litter left behind on the streets and in the surrounding neighborhoods?

I am concerned about the light pollution that will be caused by lighting on the field for the following reasons:

- Light can disrupt circadian rhythms. Having light at night that leaks into the surrounding neighborhoods would likely disrupt the circadian rhythms of the residents which in turn would lead to health problems and poor sleep. Poor sleep in turn increases the likelihood of traffic accidents and poor work performance.
- Aesthetically, the lights will be seen from residential neighborhoods and be unattractive.

Questions/considerations about lights:

- Will the lights be similar to the ones installed at the stadium at FUHS?
- What would be the combined impact on the surrounding neighborhoods when lights are on at FUHS and Sherbeck Field at the same time?
- How can lights that are as high as proposed not "leak" light into surrounding neighborhoods?
- How will the college keep the light from leaking into the surrounding neighborhoods?

I am concerned about the noise pollution caused by increased use of the field for the following reasons:

- Disruption to sleep caused by noise because of the extended hours of the field's use.
- Noise can already be heard in the surrounding neighborhoods from football games and events at FUHS, games on the baseball field at the college and events downtown, like music at market night. Adding more noise from more games and events at the field will compound the existing noise.
- Disruption to the peace and quiet currently experienced in the surrounding neighborhoods caused by increased noise from the field.
- The negative health impacts of experiencing constant/frequent noise.

Here are my questions/concerns regarding noise:

- How will the noise caused by increased usage of the field with games and rentals of the field that would be experienced by residents in the surrounding neighborhoods be measured inside and outside of their homes?
- What will the college do to dampen the noise?



- How will they measure noise from possible events through stadium rentals?
- Will noise be measured in the neighborhoods to determine the noise levels that would happen when events/games were happening at the same time at FUHS and on Sherbeck Field?

I am concerned about the safety in the the surrounding neighborhoods for the following reasons:

- Increased traffic will lead to the likelihood of more car accidents.
- Increased number of people using the stadium brings more people into the neighborhoods which in turn would increase the likelihood of crime.
- With more strangers in the neighborhood, it will be hard for residents to tell who is a potential threat to their property versus who is just parking to go the game.

Questions/Considerations regarding safety:

- How will the college and the city work together to decrease the likelihood of accidents caused by increased traffic?
- Would the college pay the city for increased police patrolling in the neighborhoods around the field to insure the safety of residents during events?

It is my sincerest hope that this stadium will not be built because of it's potential negative impact on the surrounding neighborhoods and residents. Please don't build it.

Sincerely,



Laura E. Richard-Barasch

Brockdale SANTA ANA  
on, CA 92803  
07 MAY '18  
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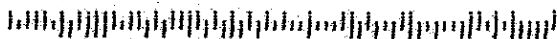
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NOCCCD FACILITIES INC

2018 MAY 10 AM 8:41

Mr. Richard Williams  
Director of Facilities  
NOCCCD  
1830 A West Romneya Dr  
Anaheim, CA 92801-1819



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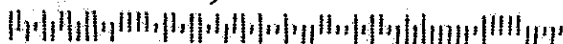
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NOCCCD FACILITIES INC

2018 MAY 10 AM 8:41

Mr. Richard Williams  
Director of Facilities  
NOCCCD  
1830 A West Romneya Dr.  
Anaheim, CA 92801-1819



Anne Richard  
605 N. Yale Ave  
Fullerton, CA 92831

May 6, 2018

Dear Mr. Williams :

This letter is regarding my objections to current plans for the renovation of Sherbeck Field, particularly the building of the stadium, the addition of the lights, and the loud speaker system. My family has owned our home on north Yale since it was built in 1951. The college and the surrounding neighborhoods have always coexisted as good neighbors. With these changes, the college is going to significantly negatively impact the quality of life for the residents who live around the school. I am deeply concerned about the impact of the changes to the field and the impact on the surrounding neighborhoods. The major impact will be a result of increased traffic, light pollution, sound pollution, and safety.

There will be increased traffic to and from the field due to its expanded use for the college and as a rental stadium. My concerns about increased traffic are as follows:

- Increased pollution in the area negatively impact the health of residents
- Increased noise due to traffic, which is also not good for the health of residents
- Parking problems. Students already park in the neighborhoods surrounding Fullerton College. Monday through Friday, my family and guests can not find parking in front of my home because students are parking there. When an emergency vehicle is needed in the neighborhood, they essentially have to double park to get to a residence. Greater use of the stadium will lead to greater parking problems in the neighborhood.
- There is already has increased traffic into residential areas, especially Monday through Thursday. An increase of events/games/use of the stadium across all days of the week will lead to increased traffic in these neighborhoods across all days of the week.
- People constantly use our neighborhood as a cut through from Berkley (Berkley to Brookdale to Yale to Nutwood to Raymond). This will only increase with increased use of Sherbeck Field.
- Litter is already a problem in the areas that the students park on campus, on Berkley and in the surrounding neighborhoods. More people using the field will lead to more litter.
- The traffic study may not be representative of what traffic would really be like when the field was in full use for the college and for rentals if traffic is studied during the summer when enrollment is low. During summer there will also be less traffic due to FUHS being out.
- One of the entrances/exits from the field is offset from the intersection of Brookdale and Berkley. Accidents happen there regularly. Increased traffic to and from the field

will increase the likelihood of accidents in this area. I can think of at least 2 or 3 fatal accidents in the stretch between Brookdale and Horner Way over the years.

- If projections of game attendees are based on the number of people who attended games at Yorba Linda High School, the projections may not be correct if there was a stadium at Sherbeck Field. Because the stadium would be on campus, attendance would likely be higher.
- Students frequently jaywalk on Berkley between Horner and Chapman. Increased traffic will increase the likelihood of accidents between cars and pedestrians.

I am concerned about the light pollution that will be caused by lighting on the field for the following reasons:

- Light will leak into the surrounding neighborhoods from the stadium lights
- Disruption to circadian rhythms due to exposure to the field lights at night. Having light at night that leaks into the surrounding neighborhoods would likely disrupt the circadian rhythms of the residents which in turn would lead to health problems and poor sleep.
- Aesthetically, the lights will be seen from residential neighborhoods and be unattractive.

I am concerned about the noise pollution caused by increased use of the field for the following reasons:

- Disruption to sleep caused by noise because of the extended hours of the field's use.
- From our neighborhood, I can already hear football games and events at FUHS, games on the baseball field at the college and events downtown, like music at market night. The addition of noise from events and games at Sherbeck would be too much.
- Noise from the increased use of the field will disrupt the peace and quiet currently experienced in the surrounding neighborhoods.
- There are negative health impacts from experiencing constant/frequent noise.

I am concerned about the safety in the the surrounding neighborhoods for the following reasons:

- Increased traffic will lead to the likelihood of more car accidents.
- More people using the stadium will bring more people into the neighborhoods which in turn would increase the likelihood of crime.
- Neighborhood Watch can no longer work because of the high number people of going and coming from the neighborhoods to reach the stadium. With more strangers in the neighborhood, it will be hard for residents to tell who belongs there and who does not belong there.

Please don't build the stadium on Sherbeck Field.

Sincerely,

*Anne E. Richard*

Anne Richard

Mr. Richard Williams

5/7/18

District Director, Facilities Planning & Construction

NOCCCD

1830A West Romneya Drive

Anaheim, CA 92801-1819

Dear Mr. Williams:

A lot has been written about the pros and cons of the proposed Fullerton College Stadium. As a nearby resident, my main concern is the impact that this stadium will have on the quality of life in our community. We will be impacted by noise and light pollution, increased traffic congestion and a reduction in property values that this stadium will have on our neighborhood.

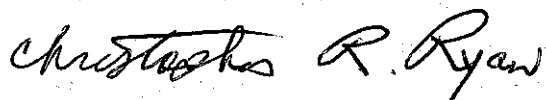
In addition to home football games in the fall, you state in your NOP that the field can be rented to outside parties Monday through Saturday from 6 am to 10 pm and on Sundays from 6 am to 8:30 pm. These hours of operation are unacceptable! As a resident, the quality of life for my family will be negatively impacted by this stadium. I welcome you to come to my house, stand in my front yard and explain to me (in full view of the proposed stadium) how this will improve my life. I am entitled to enjoy peace and quiet when I come home from work. If I want to hear the play by play I will go to the game. I don't want it broadcast through the walls of my house. When there are events at the high school stadium I can hear the public address announcements and it is approximately .25 miles away. Imagine how loud the public announcements will be now when it is across the street from our house.

Nowhere in the Environment Impact Report is there any discussion of the impact this stadium will have on area property values. This is a real life issue. Who wants their home value depreciated because of traffic congestion, noise and light pollution? What a parting gift as I approach retirement.

You have many other options at your disposal that won't impact the nearby residents such as the stadium at Cal State Fullerton. Also, I do not believe that this is the best way to spend \$4M for .005% of the student population. Stop by for a visit and put a name and face to your decision making process.

Thank you for your time and consideration.

Sincerely,



Christopher R. Ryan

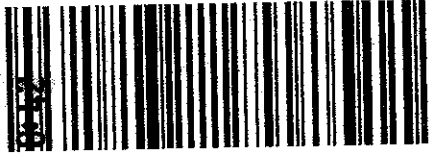
637 East Glenwood Ave.

Fullerton, Ca 92831

Cell: 209.518.4981

637 EAST GLENWOOD AVE  
FULLERTON, CA 92831

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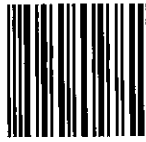
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Mr. Richard Williams  
District Director, Facilities  
Planning & Construction  
NOCCED  
1830A West Romneya Drive  
Anaheim, Ca 92801-1819

92801-182373



Mr. Richard Williams  
Director of Facilities Planning & Construction  
NOCCCD  
1830A West Romneya Dr.  
Anaheim, CA 92801-1819  
May 5, 2018

Frankie Smith  
110 Avalon Dr.  
Fullerton, CA 92835

**RE: OPPOSITION TO SHERBECK FIELD IMPROVEMENTS:** Comments for  
Inclusion in draft EIR

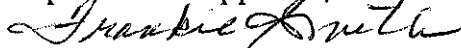
Dear Mr. Williams:

My name is Frankie Smith and I **OPPOSE** the improvement construction and planned use of Sherbeck Field. **Traffic** is already a major problem on the Lemon/Marion cross street on Brea Blvd. Southbound drivers even whip onto Marion and u-turn to the crosslight rather than wait in the gathering lineup to turn left to go up Lemon hill (another dangerous pathway). Residents on the Marion side "tremble" to enter that chaos! ANY new building project in this area is ridiculous! Renting the proposed stadium to music venues would be inviting disaster.

The creation of such a huge negative impact on the surrounding area when there are two other stadiums nearby brings one to question, "Who benefits?" In order to make money for the college at the **cost of \$5 million, reduced property values** for so many affected taxpayers, increased **crime control**, more **traffic accidents**, and general "**bad will**" from long time supportive Fullertonians just doesn't make sense to me.

Why not use that funding to alleviate the "wait list" for required courses and keep the "good will" of impacted property owners? When construction causes so much destruction of community well being where is the balance? Thank you for your consideration to change this proposed project.

In pursuit of happiness,



Frankie Smith  
110 Avalon Dr.  
Fullerton, CA 92835  
Email: fsmith28@att.net



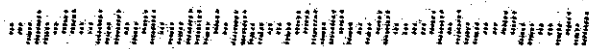
Frankie Smith  
110 Avalon Dr.  
Fullerton, CA 92835



ANAHEIM CAMPUS  
FACILITIES INC  
2018 MAY 10 AM 8:41

Mr. Richard Williams  
Director Facilities Planning  
NOCCCD  
1830 A West Romneya Dr.  
Anaheim, CA 92801-1819

9280181823 0023



## Rachel Struglia

---

**From:** Jonathan St. Amant <jonsaintamant@gmail.com>  
**Sent:** Tuesday, May 8, 2018 6:32 AM  
**To:** Richard Williams  
**Subject:** Comments on the Proposed Sherbeck Stadium

Dear Mr. Williams,

I am writing to you to express my concern for the idea of a stadium at Sherbeck Field. I think it would be an irresponsible and very inconsiderate addition to the quiet community that so many families love. In addition to the significant negative impacts the stadium would have on nighttime lighting, traffic and parking, littering, and reduction of home value, I would have to say my biggest concerns are the noise potential, number of seats, and proposed schedule of use.

I live with my wife and two kids at the house our neighborhood calls, "Ground Zero," which is directly across Berkeley at the eastern Sherbeck field goal post. We have had footballs bounce into our backyard from football practices. On some Fridays when Fullerton Union High School is hosting a game or event, we can easily hear the booming voices on the P.A. and the cheers of the crowd even with our windows closed. The idea of dealing with the noise of thousands of bleacher-stomping and screaming fans ninety feet from our backyard keeps us pretty stressed out. We put our boys (ages 5 and 8) to bed by 7:30pm each night (slightly later on weekends). We get to bed around 9pm and wake up at 4am each morning to chip away at our passion projects- writing and illustrating children's books- before heading to school (we are both teachers). I can't imagine enjoying the occasional movie or even getting a decent night's rest while an announcer's voice blasts a play-by-play, or people in the crowd stomp to the beat of a rally song. I understand that most of the time, the field will be used for practices and sports classes, which wouldn't be too noisy unless a whistle-happy coach were present. My concern comes from the potential of outside rentals. These outside organizations and schools could host playoff games, social events, concerts, etc. whose attendees would have little to no respect and/or understanding of the need for peace and quiet in the surrounding neighborhood. I read in the EIR that outside groups would need to provide their own sound equipment, but I have personally witnessed an outside football league bring massive subwoofers to Sherbeck Field to blast loud music in between a host's announcements. What can be done to reduce or eliminate the loud sounds?

I want to raise another point about the use of the stadium. Why are 4500 seats needed when no proposed event (including the college football playoffs) is expected to get audience numbers close to that level of attendance? I know that the college wants to host its own graduations, but can't extra seating be arranged and temporarily installed the one day per year it's needed? The overabundance of seating tells me the college is looking to rent that future stadium to much bigger events. If this is the case, the proposed use schedule is very misleading. Also, the proposed use schedule is only valid until the next president takes his/her seat. What's stopping a future college president from allowing programming to go right up until 10pm every night?

Lastly, I want to point out that about 500 households in the surrounding neighborhoods have signed a petition taking a stand against Sherbeck Field becoming a stadium. Does the college really want to draw the ire of that many people? Does the college even care about its community?

--

Jonathan St. Amant  
[my website](#)

Richard,

Thank you for your correspondence  
regarding a public scoping meeting on  
Tuesday, May 1st. I plan on attending.

George Stephens  
714 879 8367

Wans  
D. Cornell  
San Carlos

17 APR 2018 PM 10 L



147 N.O.C.C.N.

Richard,

**Re: Sherbeck Field Project**

5-4-18

I hope this correspondence finds you doing well.

There is concern on my part regarding the purposed Sherbeck Field project. While keeping an open mind, I have attended several meetings regarding the above mentioned project. Having been in Real Estate Lending for over 30 plus years, I have real world experience as to the adverse effect a well-lit stadium/field would bring to a community. As a corporate officer of one of the largest Savings Banks in the nation, the adverse effect caused by *traffic, noise, unwanted lighting* was always a concern to us. These adverse influences cause documented depreciation in property values.

Drawing from my years of experience in the lending industry, I would never choose to live in a home with *traffic, noise, unwanted lighting as adverse conditions*. Hence the reason my family choose not to live by Cal-State Fullerton, or in the hills by the Fullerton High School Stadium. However, now I'm being asked to accept these very adverse conditions that the renovated Sherbeck Field will bring.

Earlier I wrote of my real world experience. A few years back, El Dorado High School, in nearby Placentia, decided to bring in portable lighting to enable the football team to practice during the evening. Even though my rental property did not backed to the school, my tenant, as well as others, were upset with the infringement the lighting caused to their family's quality of life. This adverse condition must now must disclosed and effects the value and rents of the property. This has become a liability to the owners of such properties.

Before the renovation of Fullerton High Schools Stadium, my family rarely heard the noise of the P.A. system or had any issues with the lighting. After the renovation of Fullerton High School Stadium, my family can clearly hear the P.A. system and we receive some ambient light intrusion. Common sense tells us that the renovation of Sherbeck Filed will only exacerbate the lighting and noise issues. Again, a real world experience.

Your letter dated April 9, 2018 states that the above mentioned project "may have potentially significant effects" on our neighborhood environment. I submit to you that the areas touched upon by your letter "noise, aesthetics, transportation and traffic" **will** have a significant effects on the surrounding neighborhoods.

On the evening of May 1<sup>st</sup>, I had a nice exchange of ideas with a number of members of the Community College staff. I listened to their reasoning as to why the renovations to Sherbeck Field were needed.

I for one agreed with them, and do not believe there will be drunks roaming the neighborhood after games.

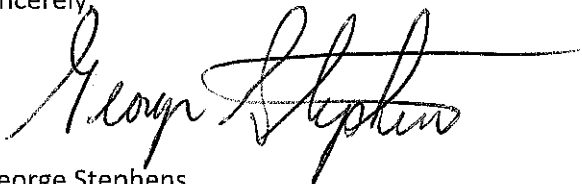
For financial reasons, it also seems like a good idea to have the football games and the commencement ceremonies at Sherbeck Field. However if the games will be played during the day and the commencement ceremonies are during the day, then there are no need for lights? Adding lights to the field to have a couple more athletic classes does not make sense to me. Also I'm confused as to why one would build a 4,000 seat stadium for commencement ceremonies when from what I was told approximately 7,000 attend these commencement ceremonies.

However, during our discussion a point came up that I had not thought of. That point was the renting of the field to non-Fullerton College groups. After doing some research, I discovered the incredibly high demand for a lighted practice field for youth sports. These fields are used throughout the week up until 10 pm. This would mean that Sherbeck Field could be used many nights of the week to fill this demand. There is an excellent likelihood of this happening. The Placentia District office informed me that use agreements can change, and that's why there are now practice lights at El Dorado. I would not want the same thing to happen at Sherbeck field.

There is obviously some give and take when living in the vicinity of a College. I understood that when choosing to move into the area. I know that during certain hours of the week day, there will be increased traffic and noise. I can accept that. However, during the evenings and weekends, when I wish to enjoy my neighborhood and home, having these and other addressed adverse issues is not acceptable to me.

Please keep this simple thought in mind when making your decision regarding Shebeck Field. Would you choose to live in an area with increased noise, aesthetics degradation, and traffic? My family and would not welcome those changes to our neighborhood.

Sincerely,

A handwritten signature in black ink, appearing to read "George Stephens". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

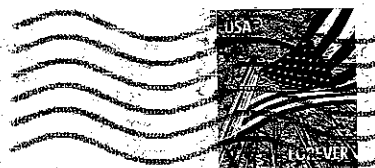
George Stephens  
556 N. Cornell Ave.  
Fullerton, Ca. 92831



Stephens  
556 N. Cornell Ave  
Fullerton Ca 92831

SANTA ANA CA 926

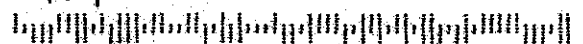
07 MAY 2016 PM 2 L



ANAHEIM CAMPUS  
FACILITIES M & G  
2018 MAY 10 AM 8:41

Richard Williams  
Director, Facilities Planning + Construction  
NOCCCO  
1830 A West Ramnaya Dr.  
Anaheim, CA 92801-1819

92801-182373



Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

Christina Tsai  
628 E Fern Dr  
Fullerton, CA 92831

**RE: OPPOSITION TO SHERBECK FIELD IMPROVEMENTS: Comments for Inclusion in draft EIR**

Dear Mr. Williams:

My name is Christina Tsai, and I OPPOSE the Sherbeck field Improvements Project for the following reasons.

How will the following issues be brought on by a stadium's construction and daily operation be mitigated?

- Noise:** large crowds, cheering from fans, noisemakers, horns and stomping on bleachers)
- Excess Traffic:** on a 2 lane street and loitering before and after events
- Light Pollution & Negative effects of LEDs :**even with advanced light shields, 80,000 watts produces intense skyglow
- Generation of Trash, Vandalism, and Crime:** of private and commercial properties
- Lewd Conduct and Crowd Control** would burden Fullerton police and neighbors
- Illegal and unlicensed street vendors** selling food or paraphernalia (this happened at graduation)

I offer a solution to building a 3<sup>rd</sup> stadium in Fullerton: use the newly renovated District Stadium at FUHS or Titan Stadium at CSUF

I look forward to participating in this process.

  
Christina Tsai

628 E Fern Dr  
Fullerton, CA 92831  
(714)686-3940

My statement,

I am a proud student Alumni of Fullerton College and a proud former Football team member that played for Coach Sherbeck, Obviously I am a supporter for the Field. I am not speaking for everyone that is FOR or AGAINST the Hal Sherbeck Field. I just want a solution found that is satisfactory for everyone and the community.

I do understand and recognize both sides FOR and AGAINST the Field being built.

When I was going to school and playing Football at Fullerton college I paid for all my school tuition, books, food and even paid for my own apartment. I worked 35 to 60 hours a week, Managed the most popular bar and night club in orange county and worked at a night club and 5 graveyard shifts at a gas station when I transferred to Sonoma State. I didn't receive any help from the state or any other source. I was not an elite athlete just a regular student like everyone else that wanted to get an education and fulfill a childhood dream of playing college football. So many women and men share the same dreams of getting an education participating in sports and are not elite athletes just living out a childhood dream.

I understand sacrifice, dedication, hard work and solutions.

I am unique because I lived in Fullerton at The Hill Crest apartments when I was going to Fullerton college, Berkeley was right outside my window. I heard the sounds from the stadium, I heard the traffic and the cars when there were no games and I didn't feel any inconvenience. Fullerton High School had the same issues with neighbors. I recall people watching games from the hills overlooking the stadium. I remember walking over to Fullerton High School for all our home game and guys spraining

their ankles on the way over from there cleats, so Fullerton High School didn't serve us all that well at least not like walking out of your own locker room.

Football is not the only sport that would benefit, women sports too.

What I learned from my Fullerton College Athletic experience was solutions and overcoming your short comings and keep your eye on what other due to succeed.

Change is always inevitable in our society. Fullerton College and the City of Fullerton will follow the trends of other High Schools, Colleges and communities as resources become limited or the schools might not be able to serve the students or the community of which it has vowed to do. Home owners, renters that move into a school zone know what they are moving into and it seems naive that change couldn't and wouldn't happen.

Fullerton College has had improvement in every decade as it will in years to come.

**Take a look at solutions through the eye of technology. When LAX was faced with a noise pollution problem, they found a solution, triple pain windows.**

**Triple pain and tinted windows would be a viable solution for local residents. If this was offered to the residents would this be a satisfactory.**

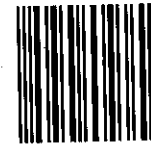
I know that Coach Sherbeck former players, Coaches and admirers would help in this cause.

What we need here is the next great community organizer that can find the solution for everyone. Ben Vega 83 84 85

From: Benjamin M. Vega.  
331 E Century Blvd  
Los Angeles CA 90003



1024



92801

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TO: North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY 18 AM 9:01

LOS ANGELES, CA 90003  
MAY 03, 2018

Larry Walker  
1322 Frances Ave.  
Fullerton, Ca 92831  
April 21, 2018

Mr. Richard Williams  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

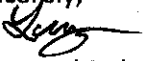
Subject: Sherbeck Field Improvements

Dear Mr. Williams:

We are totally against wasting tax payer money on this project when the little used beautiful high school stadium could be used.

We have lived just north of the college for 51 years and owned rentals south of the college for 42 years. Every year the congestion and parking become worse. Several times a week I drive on North Berkeley seeing little used athletic fields being watered and mowed while hoping I can find a parking space at my rentals. The athletic fields must be turned into parking lots.

Sincerely,

  
Larry and Judy Walker

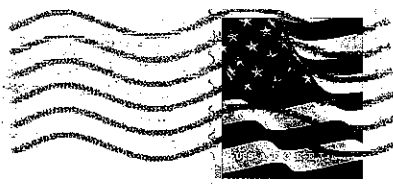


Judicial  
Watch  
Because no one  
is above the law

Mr. Larry B. Walker  
1322 Frances Ave.  
Fullerton, CA 92831

SANTA ANA CA 926

21 APR 2018 PM 2 1

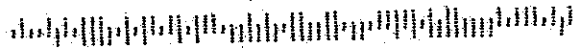


ANAHEIM CAMPS  
FACILITIES HQ

2018 APR 24 AM 8:55

MR. RICHARD WILLIAMS  
NORTH ORANGE CO. COMMUNITY COLLEGE DISTRICT  
1830A WEST ROMNEYA DRIVE  
ANAHEIM, CA 92801-1819

92801-182373



Richard Williams  
NOCCCD  
1830 A West Romneya Dr  
Anaheim CA  
92801-1819

APRIL 9, 2018

Dear Richard Williams,

I am writing regarding;

Fullerton College Sherbeck Field Improvements Project

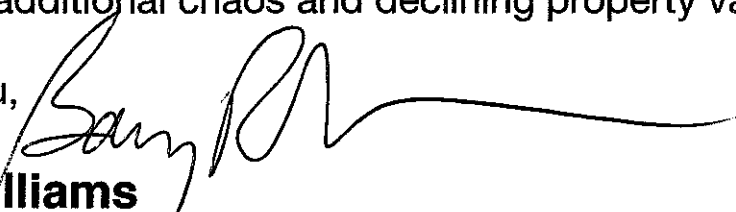
As a home owner in the neighborhood just west of Fullerton College, my family has seen increasing spillover effect of Fullerton College's inability to serve it's own student population and sporting event needs.

Parking continues to rudely infiltrate once peaceful neighborhoods  
Traffic has become dangerously dense and aggressive  
Irresponsible street crossing by scurrying students  
Trash  
Bright unnatural lights into the evening hours  
Noise levels

All of these should be contained and absorbed within Fullerton College itself, *not* the surrounding community.

Please use existing stadiums at Fullerton High School and Cal State Fullerton. A new stadium is an unnecessary waste of tax dollars and will bring additional chaos and declining property values.

Thank you,

  
**Gary Williams**  
ACCUFOOD / VICE PRESIDENT  
[gwilliams@accufood.com](mailto:gwilliams@accufood.com)  
714.812.2419



**AccuFood**

FOODSERVICE SALES

6459 Independence Avenue • Woodland Hills, CA 91367

GARY R WILLIAMS  
813 GLENHAVEN AVE  
FULLERTON CA 92832

SANTA ANA CA 926

10 APR 2018 PM 3 L



RICHARD WILLIAMS  
NOCCCD

1830 A WEST ROMNEYA DR  
ANAHEIM CA 92801-1819

92801-182373



Mr. Richard Williams  
Director, Facilities & Planning  
NOCCCD  
1830 A West Romneys Drive  
Anaheim, CA 92801-1819

**Resident Comment:**

Russell Williams  
609 N. Lincoln Ave.  
Fullerton, CA 92831

**RE: OPPOSITION TO SHERBECK FIELD IMPROVEMENTS: Comments For Inclusion in draft EIR**

Dear Mr. Williams,

I write to express my opposition to the proposed **Sherbeck Field Improvements**. The following are issues and related comments reflecting my opposition to the proposed project.

- a. Excess traffic in the surrounding areas due to FCU use and continuous rental use of the proposed facilities
- b. Transient unlicensed vendors for the continuous rental use of the proposed facilities.
- c. Crowd control, loitering, drunkenness, vandalism in residential areas including illegal parking in residential areas
- d. Anticipated yearly, taxation consequences to Fullerton resident requiring tax underwriting for increasing costs to the City of Fullerton to provide needed yearly city services due to the ongoing (likely ever-increasing private Paid Rental/Special Event Use) use of Fullerton College's Sherbeck Field.

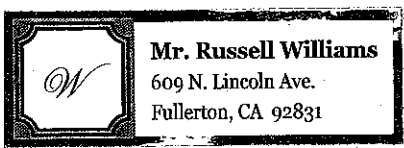
**Commentary:** As residents, my wife and I moved to this particular area to experience the community experience that Fullerton offers. We think the impact of this proposal will unfavorably altar the dynamic of contiguous residential areas surrounding the college. Ongoing, ever-increasing demands on the City of Fullerton requiring resources to address anticipated, ever-changing agreements between the city and the College regarding uses of a new facility for private, commercial events and the \$ impact to the city will, with time, become costs passed on to Fullerton taxpayers. That is the way government manages its costs. The tax payer pays the bill.

Clearly, there are community alternatives to this proposed project. Namely Fullerton College should focus on its primary need... long-term use agreements with **Fullerton Union HS or Titan Stadium at Cal State Fullerton** for specific, limited, *large event* programming needs (excluding PE) requiring **large seating capacity**.

The *multi focus mission* of the existing **Sherbeck Field Improvement Project** Proposal underscores the college's primary goal: **\$ financial revenue generating for Fullerton College**. The NOCCD project proposal will impact the surrounding community requiring additional taxpayer underwriting to mitigate city costs for multi-private events throughout the year. *Ultimately, the tax payer will pay annually into the future for this project while the college becomes the financial beneficiary annually into the future.*

Sincerely,

  
Russell Williams



SANTA ANA  
CA 926  
07 MAY '18  
PM 2 L



ANAHEIM CAMPUS  
FACILITIES H & O  
2018 MAY 10 AM 8:41

Mr. Richard Williams  
Director, Facilities  
NO CCCD  
1830 A. West Romneys Drive  
Anaheim, CA 92801-1819

92801-182373

Mr. Richard Williams

May 9, 2018

North Orange County Community College District

1830 A West Romneya Drive

Anaheim, California 92801-1819

Dear Sir,

I have been a resident of Fullerton since the fifties, attended Fullerton Junior College '50 to '52. Our kids are all grads of FJC. I know the College and the City well and the College is such an asset to our community. One Stadium has always been adequate all of these years, sure the enrollment has increased exponentially however there are still eleven players on a team. As you I'm sure, already know both schools were one district for many years so the policy of one stadium for FUHS and FJC is not new and has worked pretty well for many, many years.

My concern is not environmental but fiscal, Fullerton High just put a ton of dollars into a completely remodeled stadium with artificial turf to alleviate the wear and tare which is always present with natural grass.

I'm sure the scheduling can be worked out for those using the field. Other district are able to solve this problem without simply building a redundant stadium.

If there are funds for one more stadium why not put those dollars into a parking structure that could be used every day of the week for many events as well as student parking. A structure would give FJC's neighbors some relief from all of the street parking.

Regards

John Wolfe

105 Elsa Dr

Fullerton, CA 9283

714 525-5567

John Wolfe  
105 EISA DR  
Fullerton, CA  
92835

SANTA ANA CA 925

13 APR 2019 PM 6 L



Mr. Richard Williams  
North Orange Co. Community College  
1836 A WEST Romney A Dr  
Anaheim, CA 92801-183399

**DEPARTMENT OF TRANSPORTATION**

DISTRICT 12

1750 EAST FOURTH STREET, SUITE 100

SANTA ANA, CA 92705

PHONE (657) 328-6368

FAX (657) 328-6510

TTY 711

[www.dot.ca.gov](http://www.dot.ca.gov)*Making Conservation  
a California Way of Life.*

May 1, 2018

Richard Williams  
North Orange County  
Community College District  
1830 W. Romneya Drive  
Anaheim, CA 92634

File: IGR/CEQA  
SCH: #2018041025  
12-ORA-2018-00859  
SR 91; PM 21.933  
SR 57; PM 17.42

Dear Mr. Williams,

Thank you for including the California Department of Transportation (Caltrans) in the review of the Draft Initial Study (IS) for the proposed Fullerton College Sherbeck Field Improvements Project which is within 2 miles of both State Route 57 (SR 57) and State Route 91 (SR 91). The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

The proposed project's main objectives are to:

- Provide field lighting to allow for more evening class options for the physical education program to meet student demand.
- Provide a football field for the Fullerton College football program that meets the sizing requirements of the California Community College Athletic Association Regulations, Bylaw 4.2.6 A.
- Install permanent bleachers to reduce the costs associated with renting bleachers for the annual Fullerton College commencement ceremony.

Sherbeck Field is located in the northeastern portion of the Fullerton College campus. Fullerton College is located at 321 East Chapman Avenue in the City of Fullerton and occupies an approximately 70-acre site in northern Orange County. The project site is located 2.1 miles west of SR 57, and is 1.6 miles north of SR 91. Both SR 57 and SR 91 are overseen by Caltrans. Caltrans is the responsible agency and has the following comments:

**Traffic Operations Comments:**

1. The Traffic Impact Analysis will need to be submitted to Caltrans for review and comment.

2. In Section 6.16 (b), "Transportation and Traffic", the Draft Initial Study report states "A Traffic Impact Analysis will be conducted and the results will be included in the EIR". In regards to the preparation of the EIR, if the project will impact State right-of-way, the North Orange County Community College District will need to follow the "Guide for the Preparation of Traffic Impact Studies" in order to meet Caltrans standards. Guidance can be found at: [http://www.dot.ca.gov/hq/tpp/offices/ocp/igr\\_ceqa\\_files/tisguide.pdf](http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf). Current concerns that will also need to be addressed in the EIR include: added traffic generation, distribution and assignment to the State facilities both during and after construction, and the addition of construction trucks on freeway facilities during peak traffic periods.
3. The North Orange County Community College District will need to use the latest version of the Highway Capacity Manual (HCM) methodologies when analyzing traffic impacts on State Transportation Facilities. The following topics will need to be addressed in the traffic impact analysis as well as in the EIR:
  - a. Merge/Diverge at On/Off Ramps if applicable.
  - b. Queuing and its effects at Off Ramps if applicable.

System Planning Comments

4. According to the City of Fullerton Bicycle Master Plan (2012), there is currently an existing Class II bicycle lane located on Berkeley Avenue. Because traffic volumes may increase, appropriate measures need to be implemented to ensure the safety of bicyclists and pedestrians.

Please continue to coordinate with Caltrans for any future developments that could potentially impact State transportation facilities. If you have any questions, please do not hesitate to contact Julie Lugaro at 657-328-6368 or [Julie.lugaro@dot.ca.gov](mailto:Julie.lugaro@dot.ca.gov).

Sincerely,



MARLON REGISFORD  
Branch Chief, Regional-IGR-Transit Planning  
District 12



## CITY OF FULLERTON

Community Development Department

May 8, 2018

Mr. Richard Williams, District Director, Facilities Planning and Construction  
North Orange County Community College District  
1830A West Romney Drive  
Anaheim, CA 92801-1819

Subject: Response to Notice of Preparation of a Draft Environmental Impact Report for the  
Fullerton College Sherbeck Field Improvements Project

Dear Mr. Williams,

Thank you for the opportunity to review the Fullerton College Sherbeck Field Initial Study (IS). The City's main concerns with the project are with potential impacts on the surrounding neighborhoods due to noise, lighting and increased traffic. We are pleased that the IS acknowledges the potential for significant impacts and will analyze these topics in the EIR. The City requests that the analyses address the associated issues described below, and that the EIR include effective and enforceable mitigation measures that will protect the surrounding residential areas from light, noise and traffic intrusion.

Project Objectives:

There are various references in Chapters 2 and 3 of the IS regarding rental of Sherbeck Field to other schools and organizations. If one of the project objectives is to increase the opportunities for field rentals, this should be identified in Section 3.2.

Project Description:

Sherbeck field activities for 2016-2017 school year are included in the project description. Please discuss any changes in programming that are anticipated with the improvements to the field.

Aesthetics:

The City has concerns that project lighting may adversely affect the surrounding residential neighborhood, particularly residents to the east and north. The IS indicates that lighting impacts will be analyzed, and the City requests that the following are addressed in the analysis:

- Relative elevation of light fixtures to neighborhoods north of campus, where homes are on higher ground than Sherbeck Field
- Type of lighting fixtures to be used
- Effectiveness of proposed mitigation measures
- Enforcement of lighting curfews

Noise:

Noise is also an area of significant concern to the City, and the Initial Study describes areas to be analyzed. On page 17 of the IS, it is noted that the sound system would not be used for rentals, but also states that outside organizations could bring their own sound system. Please

**THE EDUCATION COMMUNITY**

303 West Commonwealth Avenue, Fullerton, California 92832-1775  
(714) 738-6547 • Fax (714) 738-3110 • Web Site: [www.ci.fullerton.ca.us](http://www.ci.fullerton.ca.us)





address the impacts and mitigation related to use of the proposed sound system, and also for different types of sound systems that are expected to be used by other entities who rent the field.

Traffic:

As noted in the IS, the project may increase traffic on streets in the vicinity of the proposed project. With increased traffic for sporting events, traffic peaks can be expected during the periods before and after events. We request that the traffic analysis address impacts to street infrastructure and to the following traffic conditions:

- Bypass traffic through local neighborhoods
- Offset condition of the Parking Lot 6 driveway and Brookdale Place, on Berkeley Avenue.
- "Worst case" situation where Fullerton High School and Fullerton College host games or activities simultaneously.

Please note also that any traffic control measures or construction that will affect public right of way must be coordinated with and approved by the City Traffic Engineer. Any work in public street right of way will require approval of the Director of Public Works, and that permits will need to be obtained from the City's Public Works Department.

Tribal Cultural Resources

On page 88 of the IS there are references to City responsibility for Tribal Cultural Resources. Please modify to identify that the District, as lead agency, would be responsible for those actions.

Utilities and Service Systems:

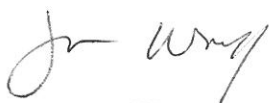
Please evaluate the impact to public infrastructure, utilizing anticipated quantities of discharge into storm drains and sewers and anticipated water use.

Alternatives Analysis:

- No project alternative
- Reduction in Size of Improvements to Sherbeck Field – Please include an analysis of a reduced-scope of stadium improvements.
- Alternative Location of Stadium – Please include an analysis of opportunities for joint use of comparable stadium facilities within the area, such as those found at Fullerton High School or California State University, Fullerton, and identify all other potential existing locations and analyzing the feasibility of such use. In addition, we ask that you include an analysis of the ability to construct a new stadium at the Cypress College campus.

The City of Fullerton appreciates the opportunity to review and comment on the Initial Study. If you have any questions on any of our comments, please feel free to contact me at (714) 738-6837 or [joanw@ci.fullerton.ca.us](mailto:joanw@ci.fullerton.ca.us), and I will put you in touch with the appropriate department.

Sincerely,



Joan Wolff, AICP  
Senior Planner



**Matthew Rodriguez**  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

Barbara A. Lee, Director  
5796 Corporate Avenue  
Cypress, California 90630



**Edmund G. Brown Jr.**  
Governor

May 3, 2018

Mr. Richard Williams  
District Director  
Facilities Planning and Construction  
North Orange County Community College District  
1830A West Romney Drive  
Anaheim, California 92801  
[Rwilliams@noccdd.edu](mailto:Rwilliams@noccdd.edu)

NOTICE OF PREPARATION (NOP) OF AN ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, 321 EAST CHAPMAN AVENUE, FULLERTON, ORANGE COUNTY (LOCATED IN THE NORTHEASTERN PORTION OF THE FULLERTON COLLEGE CAMPUS (SCH# 2018041025))

Dear Mr. Williams:

The Department of Toxic Substances Control (DTSC) has reviewed the subject NOP. The following project description is stated in the NOP: "The College plans to install permanent prefabricated aluminum bleachers, six field lighting stanchions, a new sound system, press box, and storage building at the existing Sherbeck Field. Sherbeck Field would continue to be used for academic instruction, competitive athletics, and rentals; however, Sherbeck Field is proposed to host competitive football games, which are currently held at other locations. The inclusion of field lighting as part of the project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more class options for students who may not be able to take physical education during the day. It is anticipated that these improvements would begin in spring 2019 and would last approximately 6 months."

Based on the review of the submitted document, DTSC has the following comments:

1. The EIR should identify and determine whether current or historic uses at the project site may have resulted in any release of hazardous wastes/substances. A Phase I Environmental Site Assessment may be appropriate to identify any recognized environmental conditions.

2. If there are any recognized environmental conditions in the project area, then proper investigation, sampling and remedial actions overseen by the appropriate regulatory agencies should be conducted prior to the new development or any construction.
3. If the project plans include discharging wastewater to a storm drain, you may be required to obtain an NPDES permit from the overseeing Regional Water Quality Control Board (RWQCB).
4. If planned activities include building modifications/demolitions, lead-based paints or products, mercury, and asbestos containing materials (ACMs) should be investigated and mitigated/disposed of in accordance with all applicable and relevant laws and regulations. In addition, evaluate whether polychlorinated biphenyls (PCBs) containing materials is present in onsite buildings and address as necessary to protect human health and the environment.
5. If the site was used for agricultural or related activities, residual pesticides may be present in onsite soil. DTSC recommends investigation and mitigation, as necessary, to address potential impact to human health and environment from residual pesticides.
6. DTSC recommends evaluation, proper investigation and mitigation, if necessary, of onsite areas with current or historic PCB-containing transformers.
7. The Initial Study states, "According to the documents received, the USTs were associated with a boiler plant and have been removed or abandoned in place (Fullerton Fire Department n.d.)." It further states, "However, release cases can be closed with residual contamination in place in soils, and there may be locations on campus with previously unidentified contamination. Therefore, impacts are potentially significant."
  - a. Identify the name(s) of the regulatory agency(ies) approved the closure of the contaminated site cleanups/underground storage tank (UST) sites.
  - b. DTSC is unable to evaluate whether vapor sampling and/or potential vapor intrusion risk was adequately addressed due to lack of relevant detailed information in the Initial Study.
  - c. DTSC recommends soil gas sampling and vapor intrusion risk evaluation on sites with releases of volatile organic compounds (VOCs) or total petroleum hydrocarbons (TPH). DTSC recommends soil gas sampling after to confirm no residual VOC/TPH contamination remain onsite and/or risk is acceptable based on applicable and relevant state guidelines.



Mr. Richard Williams  
May 3, 2018  
Page 3

8. If soil contamination is suspected or observed in the project area, then excavated soil should be sampled prior to export/disposal. If the soil is contaminated, it should be disposed of properly in accordance with all applicable and relevant laws and regulations. In addition, if the project proposes to import soil to backfill the excavated areas, proper evaluation and/or sampling should be conducted to make sure that the imported soil is free of contamination.
9. If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the EIR should identify how any required investigation and/or remediation will be conducted and the appropriate government agency to provide regulatory oversight.

If you have any questions regarding this letter, please contact me at (714) 484-5380 or by email at [Johnson.Abraham@dtsc.ca.gov](mailto:Johnson.Abraham@dtsc.ca.gov).

Sincerely,



Johnson P. Abraham  
Project Manager  
Brownfields Restoration and School Evaluation Branch  
Site Mitigation and Restoration Program – Cypress

kl/sh/ja

cc: See next page.

Mr. Richard Williams  
May 3, 2018  
Page 4

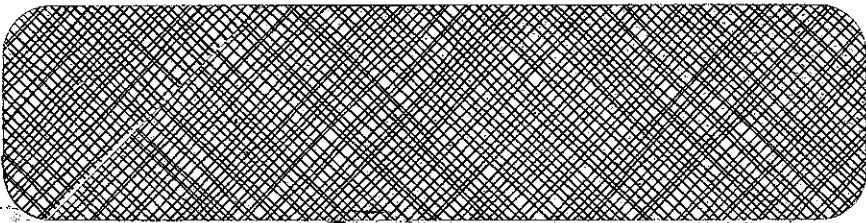
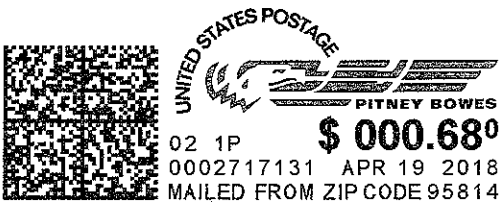
cc: Governor's Office of Planning and Research (via e-mail)  
State Clearinghouse  
P.O. Box 3044  
Sacramento, California 95812-3044  
[State.clearinghouse@opr.ca.gov](mailto:State.clearinghouse@opr.ca.gov)

Mr. Dave Kereazis (via e-mail)  
Office of Planning & Environmental Analysis  
Department of Toxic Substances Control  
[Dave.Kereazis@dtsc.ca.gov](mailto:Dave.Kereazis@dtsc.ca.gov)

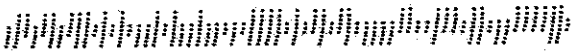
Mr. Shahir Haddad, Chief (via e-mail)  
Brownfields Restoration and School Evaluation Branch  
Site Mitigation and Restoration Program - Cypress  
[Shahir.Haddad@dtsc.ca.gov](mailto:Shahir.Haddad@dtsc.ca.gov)

CEQA# 2018041025

State of California  
Native American Heritage Commission  
1550 Harbor Blvd., Ste. 100  
West Sacramento, CA 95691



9280131823 CD23



## NATIVE AMERICAN HERITAGE COMMISSION

Cultural and Environmental Department  
1550 Harbor Blvd., Suite 100  
West Sacramento, CA 95691  
Phone (916) 373-3710



April 19, 2018

Richard Williams  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801

RE: SCH# 2018041025; Fullerton College Sherbeck Field Improvements Project, City of Fullerton; Orange County, California

Dear Mr. Williams:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for Draft Environmental Impact Report for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit. 14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd. (a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

**CEQA was amended significantly in 2014.** Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code § 21084.2). Please reference California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

## AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
  - a. A brief description of the project.
  - b. The lead agency contact information.
  - c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
  - d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).
2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
  - a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).
3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
  - a. Alternatives to the project.
  - b. Recommended mitigation measures.
  - c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).
4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
  - a. Type of environmental review necessary.
  - b. Significance of the tribal cultural resources.
  - c. Significance of the project's impacts on tribal cultural resources.
  - d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).
5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).
6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
  - a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
  - b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).



7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
- The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
  - A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).
8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).
9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).
10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
- Avoidance and preservation of the resources in place, including, but not limited to:
    - Planning and construction to avoid the resources and protect the cultural and natural context.
    - Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
  - Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    - Protecting the cultural character and integrity of the resource.
    - Protecting the traditional use of the resource.
    - Protecting the confidentiality of the resource.
  - Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
  - Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
  - Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
  - Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).
11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
- The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
  - The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
  - The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).
- This process should be documented in the Cultural Resources section of your environmental document.*

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: [http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation\\_CalEPAPDF.pdf](http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf)

- b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.
- 3. Contact the NAHC for:
  - a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
  - b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
- 4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
  - a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
  - b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
  - c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at [gayle.totton@nahc.ca.gov](mailto:gayle.totton@nahc.ca.gov).

Sincerely,

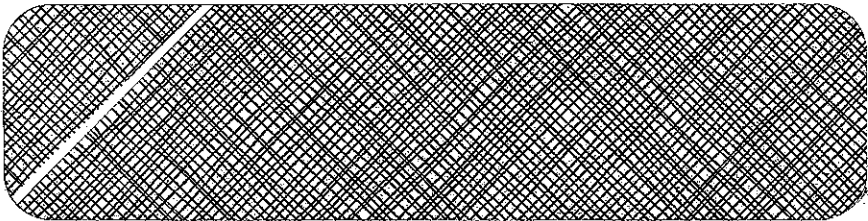
*Gayle Totton*

Gayle Totton, M.A., PhD.  
Associate Governmental Program Analyst  
(916) 373-3714

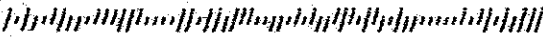
cc: State Clearinghouse

State of California  
Governor's Office of Planning and Research  
State Clearinghouse  
P.O. Box 3044  
1400 Tenth Street  
Sacramento, California 95812-3044

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EDMUND G. BROWN JR.  
GOVERNOR

STATE OF CALIFORNIA  
GOVERNOR'S OFFICE of PLANNING AND RESEARCH  
STATE CLEARINGHOUSE AND PLANNING UNIT



KEN ALEX  
DIRECTOR

**Notice of Preparation**

April 9, 2018

To: Reviewing Agencies  
Re: Fullerton College Sherbeck Field Improvements Project  
SCH# 2018041025

Attached for your review and comment is the Notice of Preparation (NOP) for the Fullerton College Sherbeck Field Improvements Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

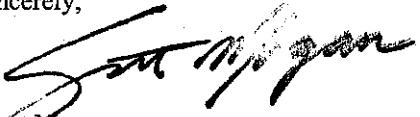
Please direct your comments to:

**Richard Williams**  
North Orange County Community College District  
1830A West Romneya Drive  
Anaheim, CA 92801

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

  
Scott Morgan  
Director, State Clearinghouse

Attachments  
cc: Lead Agency

**Document Details Report  
State Clearinghouse Data Base**

**SCH#** 2018041025  
**Project Title** Fullerton College Sherbeck Field Improvements Project  
**Lead Agency** North Orange County Community College District

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**Type** NOP Notice of Preparation  
**Description** Fullerton College plans to install permanent prefabricated aluminum bleachers, six field lighting stanchions, a new sound system, press box, and storage building at the existing Sherbeck Field. Sherbeck Field would continue to be used for academic instruction, competitive athletics, and rentals; however, Sherbeck Field is proposed to host competitive football games, which are currently held at other locations. The inclusion of field lighting as part of the project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more options for students who may not be able to take physical education during the day. It is anticipated that these improvements would begin in Spring 2019 and would last approx. 6 months.

---

**Lead Agency Contact**

**Name** Richard Williams  
**Agency** North Orange County Community College District  
**Phone** 714-808-4893 **Fax**  
**email**  
**Address** 1830A West Romneya Drive  
**City** Anaheim **State** CA **Zip** 92801

---

**Project Location**

**County** Orange  
**City** Fullerton  
**Region**  
**Cross Streets** North Berkeley Ave., North Lemon Street, East Chapman Avenue  
**Lat / Long** 33° 52' 39.6" N / 117° 54' 55.5" W  
**Parcel No.**  
**Township** 3S **Range** 10W **Section** 27,34 **Base** LaHabra

---

**Proximity to:**

**Highways** SR 57, 91  
**Airports**  
**Railways** BNSF Railway  
**Waterways** Brea Creek, Fullerton Creek  
**Schools** Fullerton Union HS  
**Land Use** General Plan: School, Zoning: P-L Public Land

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**Project Issues** Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects

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**Reviewing Agencies** Resources Agency; Cal Fire; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 5; California Department of Education; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 12; State Water Resources Control Board, Division of Drinking Water; Department of Toxic Substances Control; San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy

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**Date Received** 04/09/2018 **Start of Review** 04/09/2018 **End of Review** 05/08/2018

**Notice of Completion & Environmental Document Transmittal**

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613

For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

201 004 102 5  
SCH #**Project Title:** Fullerton College Sherbeck Field Improvements Project

Lead Agency: North Orange County Community College District

Contact Person: Richard Williams

Mailing Address: 1830A West Romneya Drive

Phone: 714.808.4893

City: Anaheim, California

Zip: 92801

County: Orange

**Project Location:** County: Orange

City/Nearest Community: Fullerton

Cross Streets: North Berkeley Avenue, North Lemon Street, East Chapman Avenue

Zip Code: 92832

Longitude/Latitude (degrees, minutes and seconds): 33 ° 52 ' 39.6 " N / 117 ° 54 ' 55.5 " W Total Acres: 4.36

Assessor's Parcel No.: N/A

Section: 27,34

Twp.: 3S

Range: 10W

Base: La Habra

Within 2 Miles: State Hwy #: SR-57, SR-91

Waterways: Brea Creek, Fullerton Creek

Airports: N/A

Railways: BNSF Railway

Schools: Fullerton Union H.S.

**Document Type:**CEQA: ☒ NOP☐ Draft EIRNEPA: ☐ NOIOther: ☐ Joint Document☐ Early Cons☐ Supplement/Subsequent EIR☐ Final Document☐ Neg Dec

(Prior SCH No.)

☐ Draft EIS☐ Other:☐ Mit Neg Dec

Other:

APR 09 2018

FONSI

**Local Action Type:**☐ General Plan Update☐ Specific Plan☐ Rezone☐ Annexation☐ General Plan Amendment☐ Master Plan☐ Prezone☐ Redevelopment☐ General Plan Element☐ Planned Unit Development☐ Use Permit☐ Coastal Permit☐ Community Plan☐ Site Plan☐ Land Division (Subdivision, etc.)☒ Other: Improvements**Development Type:**☐ Residential: Units \_\_\_\_\_ Acres \_\_\_\_\_☐ Office: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☐ Commercial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☐ Industrial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_☒ Educational: Field Improvements☐ Recreational:☐ Water Facilities: Type \_\_\_\_\_ MGD \_\_\_\_\_☐ Transportation: Type \_\_\_\_\_☐ Mining: Mineral \_\_\_\_\_☐ Power: Type \_\_\_\_\_ MW \_\_\_\_\_☐ Waste Treatment: Type \_\_\_\_\_ MGD \_\_\_\_\_☐ Hazardous Waste: Type \_\_\_\_\_☐ Other: \_\_\_\_\_**Project Issues Discussed in Document:**☒ Aesthetic/Visual☐ Fiscal☒ Recreation/Parks☒ Vegetation☒ Agricultural Land☒ Flood Plain/Flooding☒ Schools/Universities☒ Water Quality☒ Air Quality☒ Forest Land/Fire Hazard☒ Septic Systems☒ Water Supply/Groundwater☒ Archeological/Historical☒ Geologic/Seismic☒ Sewer Capacity☒ Wetland/Riparian☒ Biological Resources☒ Minerals☒ Soil Erosion/Compaction/Grading☒ Growth Inducement☐ Coastal Zone☒ Noise☒ Solid Waste☒ Land Use☒ Drainage/Absorption☒ Population/Housing Balance☒ Toxic/Hazardous☒ Cumulative Effects☐ Economic/Jobs☒ Public Services/Facilities☒ Traffic/Circulation☐ Other: \_\_\_\_\_**Present Land Use/Zoning/General Plan Designation:**

General Plan: School, Zoning: P-L Public Land

**Project Description:** (please use a separate page if necessary)

Fullerton College plans to install permanent prefabricated aluminum bleachers, six field lighting stanchions, a new sound system, press box, and storage building at the existing Sherbeck Field. Sherbeck Field would continue to be used for academic instruction, competitive athletics, and rentals; however, Sherbeck Field is proposed to host competitive football games, which are currently held at other locations. The inclusion of field lighting as part of the project would allow Fullerton College to add more evening classes, to offer a balanced schedule, and provide more options for students who may not be able to take physical education during the day. It is anticipated that these improvements would begin in spring 2019 and would last approximately 6 months.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

# NOP Distribution List

County: ORANGE *OK*

SCH# 201 8041025

## Resources Agency

- ☒ **Resources Agency**  
Nadell Gayou
- ☐ **Dept. of Boating & Waterways**  
Denise Peterson
- ☐ **California Coastal Commission**  
Allyson Hitt
- ☐ **Colorado River Board**  
Lisa Johansen
- ☐ **Dept. of Conservation**  
Crina Chan
- ☒ **Cal Fire**  
Dan Foster
- ☐ **Central Valley Flood Protection Board**  
James Herota
- ☐ **Office of Historic Preservation**  
Ron Parsons
- ☒ **Dept of Parks & Recreation**  
Environmental Stewardship Section
- ☐ **S.F. Bay Conservation & Dev't. Comm.**  
Steve Goldbeck
- ☒ **Dept. of Water Resources**  
Resources Agency  
Nadell Gayou

## Fish and Game

- ☐ **Dept. of Fish & Wildlife**  
Scott Flint  
Environmental Services Division
- ☐ **Fish & Wildlife Region 1**  
Curt Babcock
- ☐ **Fish & Wildlife Region 1E**  
Laurie Harnsberger
- ☐ **Fish & Wildlife Region 2**  
Jeff Drongesen
- ☐ **Fish & Wildlife Region 3**  
Craig Weightman

- ☐ **Fish & Wildlife Region 4**  
Julie Vance
- ☒ **Fish & Wildlife Region 5**  
Leslie Newton-Reed  
Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6**  
Tiffany Ellis  
Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6 I/M**  
Heidi Calvert  
Inyo/Mono, Habitat Conservation Program
- ☐ **Dept. of Fish & Wildlife M**  
William Paznokas  
Marine Region

## Other Departments

- ☒ **California Department of Education**  
Lesley Taylor
- ☐ **OES (Office of Emergency Services)**  
Monique Wilber
- ☐ **Food & Agriculture**  
Sandra Schubert  
Dept. of Food and Agriculture
- ☐ **Dept. of General Services**  
Cathy Buck  
Environmental Services Section
- ☐ **Housing & Comm. Dev.**  
CEQA Coordinator  
Housing Policy Division

## Independent Commissions, Boards

- ☐ **Delta Protection Commission**  
Erik Vink
- ☐ **Delta Stewardship Council**  
Anthony Navasero
- ☐ **California Energy Commission**  
Eric Knight

## Cal State Transportation Agency CalSTA

- ☐ **Caltrans - Division of Aeronautics**  
Philip Crimmins
- ☐ **Caltrans - Planning**  
HQ LD-IGR  
Christian Bushong
- ☒ **California Highway Patrol**  
Suzann Ikeuchi  
Office of Special Projects

## Dept. of Transportation

- ☐ **Caltrans, District 1**  
Rex Jackman
- ☐ **Caltrans, District 2**  
Marcelino Gonzalez
- ☐ **Caltrans, District 3**  
Susan Zanchi - North
- ☐ **Caltrans, District 4**  
Patricia Maurice
- ☐ **Caltrans, District 5**  
Larry Newland
- ☐ **Caltrans, District 6**  
Michael Navarro
- ☐ **Caltrans, District 7**  
Dianna Watson
- ☐ **Caltrans, District 8**  
Mark Roberts

- ☒ **Native American Heritage Comm.**  
Debbie Treadway
- ☒ **Public Utilities Commission**  
Supervisor
- ☐ **Santa Monica Bay Restoration**  
Guangyu Wang
- ☐ **State Lands Commission**  
Jennifer Deleong
- ☐ **Tahoe Regional Planning Agency (TRPA)**  
Cherry Jacques

## Cal EPA

### Air Resources Board

- ☐ **Airport & Freight**  
Jack Wursten
- ☐ **Transportation Projects**  
Nesamani Kalandiyur
- ☐ **Industrial/Energy Projects**  
Mike Tollstrup
- ☐ **California Department of Resources, Recycling & Recovery**  
Sue O'Leary
- ☐ **State Water Resources Control Board**  
Regional Programs Unit  
Division of Financial Assistance
- ☒ **State Water Resources Control Board**  
Cindy Forbes - Asst Deputy  
Division of Drinking Water
- ☐ **State Water Resources Control Board**  
Div. Drinking Water # \_\_\_\_\_
- ☐ **State Water Resources Control Board**  
Student Intern, 401 Water Quality Certification Unit  
Division of Water Quality
- ☐ **State Water Resources Control Board**  
Phil Crader  
Division of Water Rights
- ☒ **Dept. of Toxic Substances Control Reg. # \_\_\_\_\_**  
CEQA Tracking Center
- ☐ **Department of Pesticide Regulation**  
CEQA Coordinator

## Regional Water Quality Control Board (RWQCB)

- ☐ **RWQCB 1**  
Cathleen Hudson  
North Coast Region (1)
- ☐ **RWQCB 2**  
Environmental Document Coordinator  
San Francisco Bay Region (2)
- ☐ **RWQCB 3**  
Central Coast Region (3)
- ☐ **RWQCB 4**  
Teresa Rodgers  
Los Angeles Region (4)
- ☐ **RWQCB 5S**  
Central Valley Region (5)
- ☐ **RWQCB 5F**  
Central Valley Region (Fresno Branch Office)
- ☐ **RWQCB 5R**  
Central Valley Region (Redding Branch Office)
- ☐ **RWQCB 6**  
Lahontan Region (6)
- ☐ **RWQCB 6V**  
Lahontan Region (6)  
Victorville Branch Office
- ☐ **RWQCB 7**  
Colorado River Basin Region
- ☐ **RWQCB 8**  
Santa Ana Region (8)
- ☐ **RWQCB 9**  
San Diego Region (9)

☐ **Other** \_\_\_\_\_

☒ **San Gabriel & Lower**  
Conservancy



# South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178  
(909) 396-2000 • [www.aqmd.gov](http://www.aqmd.gov)

SENT VIA USPS AND E-MAIL:

May 1, 2018

[rwilliams@nocccd.edu](mailto:rwilliams@nocccd.edu)

Richard Williams

North Orange County Community College District

1830A West Romneya Drive

Anaheim, California 92801-1819

## **Notice of Preparation of a Draft Environmental Impact Report for the Fullerton College Sherbeck Field Improvements Project**

The South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the above-mentioned document. SCAQMD staff's comments are recommendations regarding the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Environmental Impact Report (EIR). Please send SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address shown in the letterhead. **In addition, please send with the Draft EIR all appendices or technical documents related to the air quality, health risk, and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files<sup>1</sup>. These include emission calculation spreadsheets and modeling input and output files (not PDF files). Without all files and supporting documentation, SCAQMD staff will be unable to complete our review of the air quality analyses in a timely manner. Any delays in providing all supporting documentation will require additional time for review beyond the end of the comment period.**

### **Air Quality Analysis**

SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from SCAQMD's Subscription Services Department by calling (909) 396-3720. More guidance developed since this Handbook is also available on SCAQMD's website at: [http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-\(1993\)](http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993)). SCAQMD staff also recommends that the Lead Agency use the CalEEMod land use emissions software. This software has recently been updated to incorporate up-to-date state and locally approved emission factors and methodologies for estimating pollutant emissions from typical land use development. CalEEMod is the only software model maintained by the California Air Pollution Control Officers Association (CAPCOA) and replaces the now outdated URBEMIS. This model is available free of charge at: [www.caleemod.com](http://www.caleemod.com).

SCAQMD has also developed both regional and localized significance thresholds. SCAQMD staff requests that the Lead Agency quantify criteria pollutant emissions and compare the results to SCAQMD's CEQA regional pollutant emissions significance thresholds to determine air quality impacts.

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<sup>1</sup> Pursuant to the CEQA Guidelines Section 15174, the information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public. Placement of highly technical and specialized analysis and data in the body of an EIR should be avoided through inclusion of supporting information and analyses as appendices to the main body of the EIR. Appendices to the EIR may be prepared in volumes separate from the basic EIR document, but shall be readily available for public examination and shall be submitted to all clearinghouses which assist in public review.



SCAQMD's CEQA regional pollutant emissions significance thresholds can be found here: <http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf>. In addition to analyzing regional air quality impacts, SCAQMD staff recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LSTs can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the Proposed Project, it is recommended that the Lead Agency perform a localized analysis by either using the LSTs developed by SCAQMD staff or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at: <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds>.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis.

In the event that the Proposed Project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the Lead Agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("*Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*") can be found at: <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis>. An analysis of all toxic air contaminant impacts due to the use of equipment potentially generating such air pollutants should also be included.

In addition, guidance on siting incompatible land uses (such as placing homes near freeways) can be found in the California Air Resources Board's *Air Quality and Land Use Handbook: A Community Health Perspective*, which can be found at: <http://www.arb.ca.gov/ch/handbook.pdf>. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Guidance<sup>2</sup> on strategies to reduce air pollution exposure near high-volume roadways can be found at: [https://www.arb.ca.gov/ch/rd\\_technical\\_advisory\\_final.PDF](https://www.arb.ca.gov/ch/rd_technical_advisory_final.PDF).

### **Mitigation Measures**

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize these impacts. Pursuant to CEQA Guidelines Section 15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed. Several resources are available to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project, including:

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<sup>2</sup> In April 2017, CARB published a technical advisory, *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory*, to supplement CARB's *Air Quality and Land Use Handbook: A Community Health Perspective*. This technical advisory is intended to provide information on strategies to reduce exposures to traffic emissions near high-volume roadways to assist land use planning and decision-making in order to protect public health and promote equity and environmental justice. The technical advisory is available at: <https://www.arb.ca.gov/ch/landuse.htm>.

- Chapter 11 of SCAQMD's CEQA Air Quality Handbook
- SCAQMD's CEQA web pages available here: <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies>
- SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook for controlling construction-related emissions and Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities
- SCAQMD's Mitigation Monitoring and Reporting Plan (MMRP) for the 2016 Air Quality Management Plan (2016 AQMP) available here (starting on page 86): <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-mar3-035.pdf>
- CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* available here: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>

### **Alternatives**

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires the consideration and discussion of alternatives to the project or its location which are capable of avoiding or substantially lessening any of the significant effects of the project. The discussion of a reasonable range of potentially feasible alternatives, including a “no project” alternative, is intended to foster informed decision-making and public participation. Pursuant to CEQA Guidelines Section 15126.6(d), the Draft EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project.

### **Permits**

In the event that the Proposed Project requires a permit from SCAQMD, SCAQMD should be identified as Responsible Agency for the Proposed Project. For more information on permits, please visit SCAQMD webpage at: <http://www.aqmd.gov/home/permits>. Questions on permits can be directed to SCAQMD's Engineering and Permitting staff at (909) 396-3385.

### **Data Sources**

SCAQMD rules and relevant air quality reports and data are available by calling SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available at SCAQMD's webpage at: <http://www.aqmd.gov>.

SCAQMD staff is available to work with the Lead Agency to ensure that project air quality impacts are accurately evaluated and any significant impacts are mitigated where feasible. If you have any questions regarding this letter, please contact me at [lsun@aqmd.gov](mailto:lsun@aqmd.gov) or call me at (909) 396-3308.

Sincerely,

*Lijin Sun*

Lijin Sun, J.D.

Program Supervisor, CEQA IGR

Planning, Rule Development & Area Sources

LS

ORC180410-15

Control Number



A Professional Law Corporation

1901 FIRST AVENUE, SUITE 219  
SAN DIEGO, CA 92101

TELEPHONE  
(619) 702-7892

FACSIMILE  
(619) 702-9291

May 8, 2018

***Via Email, Followed by U.S. Mail***  
[rwilliams@nocccd.edu](mailto:rwilliams@nocccd.edu)

Richard Williams,  
District Director, Facilities Planning and Construction  
North Orange County Community College District  
1830A West Romney Drive  
Anaheim, California 92801-1819

Re: *Comments on Notice of Preparation of a Draft Environmental  
Impact Report for the Fullerton College Sherbeck Field  
Improvements Project*

Dear Mr. Williams:

This office represents the nonprofit public interest group, Fullerton College Neighborhood Action Council ("Neighborhood Council"), a grassroots project and coalition of residents of the North Orange County Community College District ("District") dedicated to the protection of the neighborhoods, communities, and environmental resources within the District.

I note that the Notice of Preparation ("NOP") describes only *categories* of projects:

The initial environmental review indicates that the proposed project may have potentially significant effects on the environment in the following categories: aesthetics, air quality, greenhouse gas emissions, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, tribal cultural resources, and mandatory findings of significance. The EIR will include an analysis of these impact areas, as well as feasible mitigation measures and alternatives to avoid or reduce potential impacts.

(NOP at p. 1.)

My office requests that District supplement its NOP to identify "with sufficient information describing the project and the potential environmental effects to enable the responsible agencies to make a meaningful response." (*See* CEQA Guidelines § 15082, subd. (a)(1) & subd. (a)(1)(C) [minimum requirements for NOP].) The above list of categories is not sufficient for meaningful responses and comments. Please supplement accordingly.

Additionally, the NOP fails to meet other basic requirements pursuant to CEQA Guidelines § 15082, subd. (a)(1)(B) – namely: "Location of the project (either by street address and cross street, for a project in an urbanized area, or by attaching a specific map, preferably a copy of a U.S.G.S. 15' or 7-1/2' topographical map identified by quadrangle name). . ." (*Id.*) Please further supplement accordingly.

Page Two  
May 8, 2018  
North Orange County Community College District  
NOP Comments – Stadium Project

I do note that the NOP states such information is available elsewhere through certain websites and at District's office. (NOP at p. 1.) However, that is not compliance with CEQA Guidelines, section 15082 and there is no go gather the information "elsewhere" or "go see our website" exception.

In response to the April 9, 2018 NOP for the Fullerton College Sherbeck Field Improvements Project ("Stadium Project"), my client requests, in addition to all legally required EIR issues and topics, and those matters raised by other persons and responsible agencies, that the following issues and matters be addressed in one or more appropriate sections in the proposed EIR, including but not limited to:

1. Evaluate and address projected sports programming of Fullerton College should the Stadium Project be approved and built.
2. Evaluate and address projected rentals, during weekdays and each weekend day, of the Stadium Project, should it be approved and built.
3. Evaluate and address all actually anticipated and potential cumulative impacts arising from the instant development Stadium Project, and its use and implementation.
4. Evaluate and address all vegetation and environmental resource losses arising from not only the planned development of structures and hardscape, but also fire management zones, and other use areas and edge effects that may potentially arise from development and use of the Stadium Project.
5. Evaluate and address all field use and rental agreement proposals and policies that will be put in place for the Stadium Project as controls, mitigation measures, or otherwise.
6. Evaluate and address how mitigation measures will be implemented and enforced for all third-party rentals.
7. Evaluate and address the locations and distances that the proposed Stadium Project's field lights, and PA loudspeaker system will have on the neighboring community.
8. Evaluate and address the locations and distances that the proposed Stadium Project's building and structures may be seen and have adverse impacts on scenic and other visual resources.
9. Evaluate, identify and address how the Stadium Project, including road/s, would affect the current natural wildlife movement corridors – north to south and east to west.

Page Three  
May 8, 2018  
North Orange County Community College District  
NOP Comments – Stadium Project

10. Evaluate and address the Stadium Project's increase in impermeable surface areas and materials constituting artificial fields for runoff and water pollution impacts (including storm-water analyses).

11. Evaluate and address the consistency and compliance with the city of Fullerton's ordinances and programs controlling grading and drainage.

12. Evaluate and address all issues regarding the Stadium Project's effect on traffic circulation, parking, and impacts to morning and evening commutes (and all cumulative effects thereof).

13. Evaluate and address all issues regarding the Stadium Project's direct, indirect, and cumulative effect of added greenhouse gases.

14. Evaluate and address whether a plan for the reduction of greenhouse gas emissions been adopted in the area covered by Stadium Project, and whether the Stadium Project is consistent.

15. Evaluate and address the baselines of all impacts currently found likely to be significant in the Initial Study, and evaluate whether the Stadium Project causes a cumulative impact for each.

#### Project Alternatives Analysis

Review and consider the following impact-reducing project alternatives that will fulfill one or more important goals and purposes of the project.

1. Alternative location at Fullerton High School or Yorba Linda High School
2. A reduction in Stadium Project size
3. A field policy for the number of events, and hours of events, along with a field use policy or use agreement for rentals or other third party use.
4. A reduction in planned rental use and rental caps.

Pursuant to CEQA and Public Resources Code § 21092.2, please provide my office (at the above address) written notice of any available documents, and any informational or decision-making meetings for, or relating to, the herein subject Stadium Project (whether preliminary or final)

Page Four  
May 8, 2018  
North Orange County Community College District  
NOP Comments – Stadium Project

Should you have any questions or desire any clarification about any of the above, please do not hesitate to call and ask.

Sincerely,



Craig A. Sherman

May 6, 2018

Kevin and Karen Arthur  
1205 Luanne Ave  
Fullerton, CA 92831

Mr. Richard Williams  
1830A West Romneya Drive  
Anaheim, CA 92801-1819

Re: Fullerton College Sherbeck Field Improvements Project

Dear Mr. Williams,

My wife and I do not support the "improvements" that Fullerton College proposes to make to Sherbeck Field.

In our opinion, they are excessive, unnecessary, a misuse of taxpayer monies, and most importantly will cause a significant detrimental effect on Fullerton College's neighboring community.

As a matter of fact, we are at a loss to understand exactly what Fullerton College is trying to accomplish with it's proposed slate of "improvements". Will the College become the premiere College of "Parking Lot Construction Practice" or something? Near as we can tell, by the time you are done covering every square foot of available space with massive monolithic parking structures, probably 25% of the campus footprint if not more will be dedicated solely to parking. This for a mostly part-time population of students who dwindle within a matter of weeks after the start of any semester if our observations of the pattern of student parking in our neighborhood mean anything.

How about if the College focus on it's core mission - education?

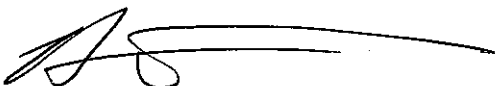
As far as the Sherbeck field goes it is ludicrous to waste taxpayer monies and inflict significant negative impacts - excessive noise both from stadium speakers and attendees, light, trash, traffic, etc., etc. - on the surrounding community when there is a beautiful, newly refurbished stadium just 100 yards from Sherbeck field. There is absolutely NO reason whatsoever why the gorgeous Fullerton High School stadium on which significant taxpayer dollars were spent cannot be used for any and all Fullerton College football games and other events as necessary.

We reject and do not support your proposed improvements to Sherbeck Field and indeed, many of the other proposed "improvements" (such as building yet another parking structure on NE corner of Lemon/Berkley).

Fullerton "Community" College needs to remember that it is a community college, not a Cal-State or University of California institution. You exist in a local community that has supported you for decades. Stop the dreams of grandiosity and focus on your core mission - education.

Sincerely,

Kevin and Karen Arthur

A handwritten signature in black ink, appearing to be a stylized 'K' followed by a long horizontal line and a small loop at the end.

K. ALTHUR  
1205 LUANNE AVE  
FULLERTON, CA 92831

RECEIVED

MAY 09 2018

NOCOD  
ACCOUNTS PAYABLE

Mr Deliver  
to Rock  
5/9/18

Mr. Richard Williams  
1830A West Pomona Drive  
Anaheim, CA 92801-1819

ANAHEIM CAMPUS  
FACILITIES DEPT

2018 MAY 10 PM 3:53



---

**Samuel J. Castellano**

541 Princeton Cir. East  
Fullerton, CA 92831  
(714) 330-5140  
sjcastellano@gmail.com

1 May 2018

**Mr. Richard Williams**

Director, Facilities Planning & Construction  
NOCCCD  
1830 A West Romneya Drive  
Anaheim, CA 92801-1819

RE: Opposition to Sherbeck Field Improvements: Comments For Inclusion in  
Draft EIR

Dear Mr. Williams,

My name is Sam Castellano and I STRONGLY OPPOSE the Sherbeck Field Improvements Project because of the following reasons listed below. I am deeply concerned at the intentions of Fullerton College and how they are going to guarantee minimal impact to my family (we have a toddler and a baby on the way) and the residents of the local neighborhood.

- **Noise** - There is a tremendous amount of noise pollution from athletic stadiums (air horns, screaming, traffic/horns, metal bleacher stomping), especially since it seems likely that you will be renting the facility for many purposes.
- **Traffic** - Let alone the tremendous amount of traffic that Berkeley will see, I am gravely concerned about the increase on Brookdale, as it already is being used as a shortcut for the students of Fullerton College. I just witnessed an accident less than a month ago, and I am regularly grabbing my toddler tightly as we watch students speed through Brookdale to get to class on our nightly walks.
- **Light** - Your 3-D renderings at the Open House were embarrassing. It actually showed the light from the stadium directly lighting up the backyards of the residents on Princeton Cir. West. This would be inexcusable to affect residents with this much blatant disregard.
- **Lewd Conduct and Crowd Control** - Before we passed our neighborhood parking permit ordinance, we endured unbelievably disgusting behavior from the athletes and students of Fullerton College. Changing (including shorts/pants) in front of our houses,

obscenely profane/racial language, and inordinate amounts of trash was commonplace. Our parking permits that we have are only required from 7 am - 7 pm Monday - Friday. So when Fullerton College plays their games on Saturday, this means all ordinances are off at Saturday games/events, as are any sort of behavior regulations. For far too long, I have observed the behavior of many disrespectful young adults. I fear this will only worsen on weekends and at sporting events, no less.

For several years my family and I have endured a heightened sense of awareness due to the rising student population at Fullerton College. Even if only for a couple hours at a time, this would likely continue with a 5,000-seat stadium at Sherbeck Field. Moreover, many of us are genuinely concerned that your proposal would certain inflict damage upon the property values of our homes since your project does nothing to improve/appreciate the area. We do not want this opposition to come to any sort of civil disagreement, so we sincerely hope that this project does not cause any sort of direct depreciation to the value of our homes. I would like to see in your proposals, projected effects of your project on property values.

So as not to think I am only offering reasons for my opposition with no solutions whatsoever, I believe the solution to be an easy one. Instead of building another stadium within the same block, use the newly renovated District Stadium at FUHS or even Titan Stadium at CSUF.

I truly look forward to participating in this process and hearing your response to my input.

Sincerely,

A handwritten signature in black ink, appearing to read "Samuel J. Castellano", with a long horizontal flourish extending to the right.

**Samuel J. Castellano**



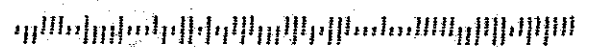
Mr. & Mrs. Castellano  
541 Princeton Circle E  
Fullerton, Ca 92831

SANTA ANA CA 926

09 MAY 2018 PM 8 1



Mr. Richard Williams  
Director, Facilities Planning & Construction  
NOCED  
1830 **A** W. Romneya Drive  
Anaheim, CA 92801-1819



**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: MURIEL BERGMAN

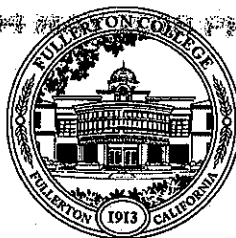
Agency/Affiliation: \_\_\_\_\_

Address: 1060 GRANDVIEW AVE

Email Address: FULLERTON

Comment: THE WEST NEIGHBOR-  
HOOD THAT SURROUNDS THE  
COLLEGE AND HIGH SCHOOL HAS  
BEEN SUBJECTED TO LIGHT AND

92801-183359



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPOS  
FACILITIES MFG  
2018 MAY 8 AM 9:41



Comment continued: NOISE POLLUTION, AS WELL AS OVERWHELMING TRAFFIC AND PARKING PROBLEMS, FOR DECADES AND NOW YOU ARE ASKING THESE TAXPAYERS TO SUFFER A SECOND STADIUM WHICH WILL DOUBLE THE PROBLEMS THAT ALREADY EXIST.

THE SECOND STADIUM PROJECT IS NOT AN IMPROVEMENT FOR FULLERTON RESIDENTS, IT IS A DETRIMENT TO THEIR DAYTIME AND NIGHTTIME QUALITY OF LIFE.

SANTA ANA

CA 926

02 MAY '18

PM 4 L

Fullerton College

Sherbeck Field Improvements Project EIR

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Amy Dickinson  
Agency/Affiliation: Adjunct Faculty @ FC and  
close neighbor to FC

Address: 613 Princeton Cir W Fullerton

Email Address: amedickinson@exglobal.net

Comment: I have the privilege to  
teach our students at Fullerton College. I  
also have the unique position of living  
directly across the street from the proposed



A47 170922 183707

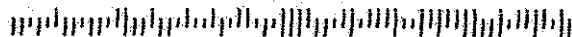
FOREVER



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHIM CAMPUS  
POLITICS H 6 6  
2018 MAY -8 AM 9:41

92801-183399



the plans of  
Comment continued: stadium. The degree of this proposed stadium does  
not match the perceived need. Our football team and the potential for  
evening <sup>physical</sup> ~~classes~~ <sup>are</sup> ~~are~~ insignificant in contrast to the injury this project  
will affect the surrounding neighborhoods, specifically my home.  
FC should not be using resources for an insignificant population  
on our college campus. I have taught at FC for 11 years, so I  
understand that <sup>this</sup> is not a <sup>consequential</sup> perceived need for our campus.

This project is a "feel good" project. It is based on a need to  
honor a man, Coach Sherbeck, and our victorious football team.  
Yet these are anecdotal at best, and they cannot compete with  
the injurious nature to my home and neighborhood in terms of  
light pollution, noise pollution, and traffic. "Feelings" should not play  
a part in making this decision.

Fullerton College  
Sherbeck Field Improvements Project EIR

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: JEFF HOLT

Agency/Affiliation: RESIDENT

Address: 741 E. HARMONY LN.

Email Address: Roberttholt@sbcglobal.net

Comment: THESE PROSED IMPROVEMENTS

WILL BE A VISUAL AND

SONIC ASSAULT ON THE

SURROUNDING COMMUNITY.

SANTA ANA CA 928

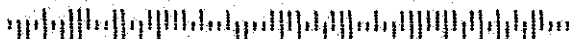
05 MAY 2018 PM 3 L



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CALIFORNIA  
FACILITIES M 20  
2018 MAY -8 AM 9:41

92801-183399





Comment continued: THE IDEA OF COMPETING EVENTS  
ON NIGHTS FROM TWO STADIUMS SEPERATED BY  
A FEW HUNDRED YARDS IS NOTHING BUT A  
PROPOSED NIGHTMARE FOR SURROUNDING NEIBORS.  
THIS IS NOT AN IMPROVEMENT FOR OUR  
COMMUNITY.

Fullerton College  
Sherbeck Field Improvements Project EIR

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: MARY BETH HOET

Agency/Affiliation: RESIDENT

Address: 741 E. HARMONY LANE

Email Address: \_\_\_\_\_

Comment: This project proposal is  
an egregious overstep  
for our surrounding  
community and neighbors.

92801-183399

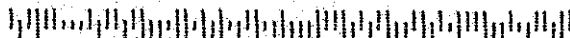
SANTA ANA CA 92805

05 MAY 2018 PM 3:11



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CALIFORNIA  
MAY 8 2018  
AM 9:41



Comment continued:

The probing strain, increased glare from  
lights, and noise from a powerful audio  
system is nothing but a denigration to our  
community. Colleges and schools can improve  
an area and environment, but this proposal  
will be a catastrophe that causes great  
damage to our community.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Loretta Hooghkirk

Agency/Affiliation: neighbor

Address: 1229 Longview Dr

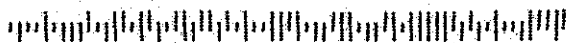
Email Address: GUTLOR@aol.com

Comment: Hello, I live up the hill and  
can see Fullerton College from my  
backyard. A few things that concern  
me of the proposed improvements to

92801-183399



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801



Comment continued: Sherbock Field are:

- 1) How tall the four lighting posts will be and how they will  
affect both my view and will there be light shining in my yard?
- 2) How loud will the PA system be?
- 3) Will there be increased traffic and spill over parking on  
my street?
- 4) How late will events be allowed and late will the lights be on for?

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Mike Hooghkirk

Agency/Affiliation: Neighboring Property

Address: 1229 Longview Dr.

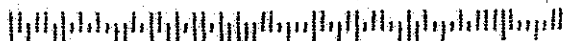
Email Address: mhooghkirk@gmail.com

Comment: Hello, I live up  
the hill and can see Fullerton  
College from my back yard. A  
few things that concern me

92801-183399



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801



Comment continued: proposed improvements to Sherbock Field are:

- ① How tall the four lighting posts will be and how they will affect both my view and will there be light shining in my yard?
- ② How loud will the PA system be?
- ③ Will there be an increase in traffic and spill over parking on my street?
- ④ How late will events be allowed and how late will the lights be on?

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Brice Hunt

Agency/Affiliation: — <sup>LOCAL</sup> HOMEOWNER

Address: 510 DOROTHY DR.

Email Address: \_\_\_\_\_

Comment: ★ VEHEMENTLY

OPPOSED TO STADIUM -

SPEAKERS - LIGHTING etc.

WE HAVE BEEN THRU

THIS TWICE BEFORE.



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801



**Fullerton College**  
**Sherbeck Field Improvements Project EIR**  
*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: SANDEE HUNT

Agency/Affiliation: HOMEOWNER

Address: 510 DOROTHY DR

Email Address: bsrhunt@masuda  
central.com

Comment: \_\_\_\_\_

I am strongly AGAINST  
having the stadium improvements  
because of the extra traffic,  
noise and rental of the  
stadium to outside entities.



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued: I witness almost weekly, car accidents on the streets nearby, especially on Berkeley! We already have a loud sound system from the high school! Another stadium will increase the noise pollution and we live closer to Fullerton College. The added car pollution will ~~also~~ be detrimental to our environment. The small good the ~~the~~ improvements make do not outweigh the larger problems and pollution created by them. I am against the improvements!

**Fullerton College  
Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Ellen Lentz

Agency/Affiliation: \_\_\_\_\_

Address: 413 Dorothy Dr Fullerton

Email Address: efalentz@hotmail.com

Comment: There is much

more to consider than

just your students.

This is a community

92801-1833999

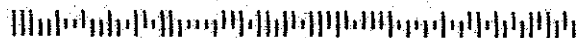
SANTA ANA, CA 92705

05 MAY 2018 PM 11



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPUS  
FACILITIES H.G.O.  
2018 MAY -8 AM 9:41



Comment continued: school in a COMMUNITY! You  
need to consider the community  
surrounding this school as well!

We already suffer & this stadium  
would further magnify:

noise

traffic & unsafe drivers

trash

light pollution

And would destroy our neighborhood  
environment.

Why is this school more important than  
the quality of our lives?

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Bill Miller

Agency/Affiliation: Resident

Address: 512 E. Princeton Cir

Email Address: emiller5120@gmail.com

Comment: Inside



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued: Prior to our street enacting permit only parking  
we were subjected to daily disturbances from Fullerton College Students.  
loud noise at early hours from car radios and conversations.  
Trash left on our lawn, drug deals taking place openly on  
the street and lewd behavior in cars was a constant  
occurrence. We do not speculate that a stadium  
would have an impact on the quality of life for  
neighborhood residents, this history confirms it for  
us.

Good neighbors do not impose their will and annoyances,  
we demand that Fullerton College that exists in a neighborhood  
conform to behavior of a good neighbor.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Ursula Oleksyn

Agency/Affiliation: neighbor

Address: 912 E. Union Ave, Full.

Email Address: uoleksyn@gmail.com

Comment: "improvement" for whom?

It's a change, growth, not improvement.

How about the negative impact on the quality  
of life of the neighboring house owners, environment,  
parking, noise, air quality? Why is "more"

"bigger" necessary? Is it always better? We already have a stadium  
big, modern that fits into our nice, attractive college campus. It's even too bi  
already". It must be a profit generator for the school!!! That's all!!



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Marlon Rizo

Agency/Affiliation: No Stadium Campaign

Address: \_\_\_\_\_

Email Address: \_\_\_\_\_

Comment: Lower tuition

costs before building

A stadium!!!



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801



**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: CHRIS RYAN

Agency/Affiliation: HOME OWNER

Address: 637 E. GLENWOOD AVE  
FULLERTON, CA 92831

Email Address: MCRYAN@SBOGLOBAL.NET

Comment: I AM AGAINST THE

FOLLOWING IMPACTS ON

OUR NEIGHBORHOOD:

(NOISE POLLUTION)



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued: \_\_\_\_\_

- ② LIGHT POLLUTION
- ③ TRAFFIC CONGESTION
- ④ LOSS IN PROPERTY VALUES

WE DON'T WANT NOR NEED THE STADIUM  
ACROSS THE STREET FROM OUR HOMES.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Susan Ryan

Agency/Affiliation: \_\_\_\_\_

Address: E. Glenwood Ave

Email Address: mcryans@shcglobal.net

Comment: \_\_\_\_\_

please do not spend  
\$4 million to turn  
Sherbeck field into  
an unnecessary ↘



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued:

football stadium. We neighbors do not need the noise, trash & congestion. Just yesterday there was an event going on where the noise level was unacceptable. Please use FHS stadium for your football team that does not even serve local athletes. Also, your plan will devalue our property which is unacceptable! Use the funds to increase academic opportunities — the stadium is not a classroom. Please stop pushing your agenda on the neighborhood once again.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**  
*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Jo Sand

Agency/Affiliation: home owner

Address: 1530 Melody Ln 92831

Email Address: jsand11@hotmail.com

Comment: \_\_\_\_\_

We do not want the  
stadium built at FCC.  
Too much traffic, noise,

92801\$1833 C023



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPUS  
FACILITIES MFG  
2018 MAY -8 AM 9:47



Comment continued: congestion if stadium is built.

We have 2 stadiums within ~~1~~ a mile or less of FCC, which should be used to accomodate FCC football.

Lower values to homes in area will result.

~~1~~ Too much negative impact to our community.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Laurice Singer

Agency/Affiliation: neighbor

Address: 401 E. Dorothy Dr.

Email Address: sing4usa@aol.com

Comment: Against project.

Use high school stadium.

→ Waste of taxpayer money.

Too much noise, traffic, lighting,

a trash

You should listen to the people  
in the neighborhood.



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Robert Singer

Agency/Affiliation: neighbor and high school  
district trustee

Address: 401 Dorothy Drive, Fullerton, 92831

Email Address: Sing4us@aol.com

Comment: Significant negative impacts

are likely to the surrounding

neighborhoods in the following ways

(please see reverse side of card):

92801-183399

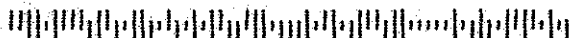
SANTA ANA CA 9266



USA FOREVER 2018

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPUS  
FACILITIES M.D.  
2018 MAY -8 AM 9:41





Comment continued: 1. Dramatic increases likely in noise and night lighting from various events.

2. Drugs, alcohol, and undesirable behaviors by event participants will likely increase vandalism, health issues and vulnerability, accidents, possible deaths, and raise dangers to children and other residents.

3. Loss of privacy to neighbors

4. Parking difficulties and street congestion will increase significantly for many periods and events.

5. Football and athletic competitions could be conducted adequately and much less expensively for taxpayers and the college by sharing the new artificial turf stadium at Fullerton Union High School, only one to two blocks away, and/or other venues.

(Please see reverse side of card)

Fullerton College  
Sherbeck Field Improvements Project EIR

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Desi St. Amant

Agency/Affiliation: Resident

Address: 621 Princeton Circle West

Email Address: dstamant07@gmail.com

Comment: I have serious concerns

about the following issues:

\*Increased traffic: we have more cars speeding  
through these streets, putting children and other  
drivers at risk (very limited visibility).

92801-183359

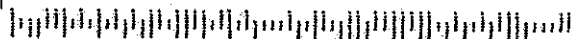
SANTA ANA CA 926

08 MAY 11 PM 7 L



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPOS  
FACILITIES 50  
2018 MAY 11 AM 8:41



Comment continued: ~~\*The~~ sound study was conducted on a day when few students were at school with no traffic & sparse street parking. This skews sound study results. Why would this be done on the last day of classes (12/15/17)? if you wanted accurate info? ~~\*We~~ we can hear lots of sound from our home. we can hear coaches yelling/cursing at players, ~~from~~ (Not amplified), we can hear noise from Fullerton HS games. We have young children who go to bed early, and I am concerned about their quality of sleep if noise & light is spilling into their bedroom (which already is to a certain extent). ~~\*I am~~ I am concerned about increased trash (from tailgates, etc.) since we already find broken beer bottles, marijuana paraphernalia, and food wrappers behind our home and even tossed into our backyard. ~~\*According to the~~ According to the Fullerton News Tribune on Nov. 27, 1973, an investigatory committee dismissed plans for a stadium because "the location is primarily residential." what has changed about the location?

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Luke Lidyoff

Agency/Affiliation: Homeowner

Address: 1233 Longview Drive, 92831

Email Address: Lidyluke@hotmail.com

Comment: \_\_\_\_\_

Dear Mr. Williams,

We and many neighbors are  
extremely concerned with the  
over →

92801-163399

SANTA ANA CA 926

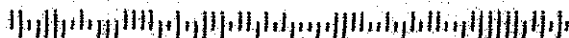
07 MAY 11 PM 41



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY 11 AM 8:41

ANAHEIM CA 92801  
FACILITIES M/C



Comment continued: proposed stadium. We support  
sports and Fullerton College but the proposed stadium  
will impact our environment Living just above the college  
with a view of the existing field:

- Lighting poles will pollute the night sky and shine  
directly into our backyard and house.
- Sound/PA system will effect our quiet enjoyment,  
again sound waves will be in direct line with our home.
- Parking and traffic will be heavy during events in an  
already over-used area. Fullerton College doesn't have  
adequate parking as it is. Why not use public funds for  
a new parking structure or facilities to allow more classrooms
- Fullerton College should use existing fields at Fullerton HS or CSUF.  
Thank you, Luke Lidvoff

**Fullerton College  
Sherbeck Field Improvements Project EIR**

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Jane Sylvestre

Agency/Affiliation: \_\_\_\_\_

Address: 804 Nutwood

Email Address: jsylvestre@aol.com

Comment: We don't need 3 stadiums

in Fullerton. Noise lights traffic -

don't need 4 signals on Berkeley

too big an impact! Don't need

SANTA ANA CA 92705

07 MAY 2018 10

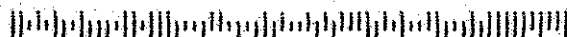


North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY 11 AM 8:41

ANAHEIM CAMPUS  
FACILITIES H.D.O.

92801-183399



Comment continued: Any of you on the board who are  
going to build this live near this?  
We don't need 4500 seats, Traffic & parking  
are already bad.

The meeting you had was not like a  
public meeting. Most public meetings people  
can ask questions for everyone to hear  
and get answers. Was like you didn't want  
the people to hear all the questions. Poorly done  
to give us information and answers - Use the  
money for Veterans center and more arts buildings

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**  
Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Lanette Lidyoff

Agency/Affiliation: Homeowner

Address: 1233 Longview Dr. Fullerton

Email Address: lanettes@yahoo.com

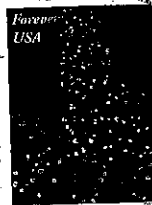
Comment: Dear Mr. Williams

Our neighborhood is  
incredibly concerned about  
the proposed Stadium. We  
fully support Fullerton  
college sports, however the

92901-183339



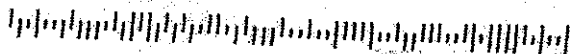
SANTA ANA, CA 92705



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY 11 AM 8:41

ANAHEIM CALIFORNIA  
92801





Comment continued: new proposed stadium will definitely  
impact our environment living right above the  
college. From our home we see -

1. Lights from current field that alter the night  
sky and shine into our backyard + other homes  
around us.
2. Parking & traffic will increase during these  
events. we should use public funds to have  
another parking structure. Our streets currently  
get used by college students.
3. The PA / Sound System will effect our  
quiet environment. It's already loud enough  
with current stadium.
4. Please use existing Fullerton HS or CSUP fields.

Thank You — Laretha Liddell

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: ADAM MERCADO

Agency/Affiliation: resident

Address: 529 PRINCETON CIR. W

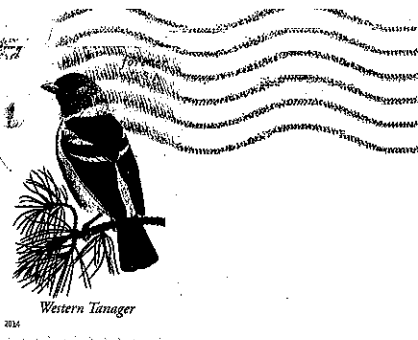
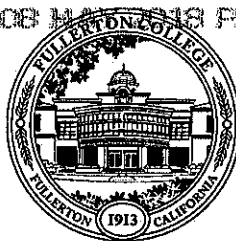
Email Address: adammercado@att.net

Comment: My main concern with  
the current proposal is the  
scope of the project appears to  
be greater than the needs of

92801-183399

SANTA ANA CA 92707

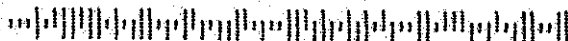
08 MAY 2018 PM 3:11



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY 11 AM 8:41

MAIL ROOM



Comment continued: the college. My understanding is the current average football attendance is under 1,000 people. I don't understand why the need for a 4,400 seat stadium in this necessary. I appreciate the need to control the home team scheduling, and for the ONCE-A-YEAR commencement (for which additional bleachers can be shipped in). The concern in this light is that a larger stadium is more attractive to other schools (for football and commencement) and other third-parties (for concerts and shows). While I support the school in its athletics needs, I wholly oppose the use for anything else. The negative side effects

cont...

• cont.

are many:

Noise From an overly large public address system, crowds, arriving and departing traffic.

Traffic From greater out of town visitors than would be generated by a home-team athletics event, exacerbated by people looking for free parking on residential streets

Light Pollution From a massive 80,000 watt LED system towering over residents houses

Other negative side effects, like an increase in trash and vandalism in the neighborhood; lewd and rowdy crowd problems; street vendors and scalpers selling merch and tickets.

There are several compromised solutions that can be made, and of which are preferable to the current plan:

- Share the stadium for big events with Fullerton H.S.
- Restrict the scope of the project to 2,200 to make it less attractive to bigger events.
- Keep events daytime only by removing lighting from the current plan.

Fullerton College  
Sherbeck Field Improvements Project EIR

Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Jon St. Amant

Agency/Affiliation: resident

Address: 621 Princeton Cir. West

Email Address: jonsaintamant@gmail.com

Comment: My biggest concern  
with the potential stadium  
is the noise from the proposed  
P.A. system and fans.

92801-193399

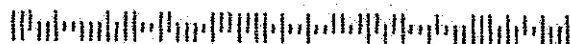
SANTA ANA CA 926

04 MAY 2018 PM 2 L



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

ANAHEIM CAMPUS  
FACILITIES M.C.  
2018 MAY -8 AM 9:41



Comment continued: I can imagine the aluminum bleachers  
being put to good use as drums with thousands of  
feet stomping in unison. There is a company  
that makes sound-absorbing walls (soundwalls.com) which  
could provide an important buffer between the stadium  
and surrounding community. The walls are designed  
to absorb and dampen sound, similar to how the  
foam in a sound-recording booth works. If a  
wall could be built high enough to cover the  
highest P.A. speaker, it could greatly reduce the  
noise impact.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**  
Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Shirley Wooldridge

Agency/Affiliation: \_\_\_\_\_

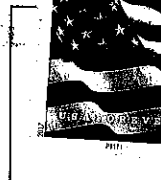
Address: 110 Avalon

Email Address: saw4@mac.com

Comment: I cannot imagine  
why this is even being  
considered! The  
current traffic

92801-183399

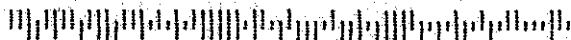
SANTA ANA CA 926



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY -8 AM 9:41

ANAHEIM CAMPUS  
FACILITIES HQ



Comment continued: congestion is already a major  
problem. Lights, noise & litter will make  
adjoining neighborhoods a disaster. which  
will decrease property value.

Please rethink the impact on fellow  
Fullertonians!!

Suboldridge



**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Jan Youngman

Agency/Affiliation: LAX Payer

Address: 3120 San Juan Dr

Email Address: \_\_\_\_\_

Comment: There is no need

for a stadium at the  
Fullerton College - when there  
is one at Fullerton H.S.

Waste of money - I will work  
to vote all trustee out: this issue  
of office



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued: What a waste of money Students  
need more classes available so they can progress  
in School - Use "Our" Tax payers money wisely!!

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

Please leave comment card in one of  
the drop off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name:

*Dan Chlesowski*

Agency/Affiliation:

*Alumni*

Address:

*11 Southside Ct*

Email Address:

Comment:

*Built the  
Stadium 100 years  
in the making*



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**  
*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: MIKE CLAY

Agency/Affiliation: PRESIDENT

Address: 1533 VIRGINIA Rd.

Email Address: mrclay103@yahoo.com

Comment: THREE GENERATION

OF MY FAMILY ATTENDED  
FULLERTON COLLEGE.

I FULLY SUPPORT



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Comment continued: THE NEW "REDO" OF THE STADIUM!

WHY DO WE UPGRADE? WE DO THIS  
FOR FUTURE GENERATIONS — FOR THE  
PROGMENT OF OUR NEIGHBORHOOD  
AND FC SPORTS. WE WOULD NOT  
WANT OUR LOVED ONES HAVING SURGERY  
WITH 20-30 YEAR OLD EQUIPMENT SO  
WHY WOULD WE WANT THAT FOR  
COMMUNITY? I LIVE IN THE IMMEDIATE  
AREA AND WILL ONLY UPGRADE  
AND IMPROVE OUR "COMMUNITY" COLLEGE.

**Fullerton College**  
**Sherbeck Field Improvements Project EIR**

*Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).*

Name: Yolanda Duron

Agency/Affiliation: Fullerton College

Address: 250 W. Santa Fe Ave 92832

Email Address: yduron@fullcoll.edu

Comment: This is a great idea  
and will build MORE community  
involvement, and it will improve  
the student experience. This is  
for all students!!



Place  
Stamp  
Here

North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

Fullerton College  
Sherbeck Field Improvements Project EIR  
Please leave comment card in one of  
the drop-off boxes or mail this card by the end  
of the scoping period (May 8, 2018).

Name: Tenney

Agency/Affiliation: —

Address: 601 E Glenwood Ave

Email Address: —

Comment: We want it

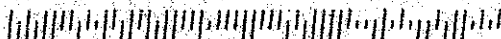
Known that we are  
okay with the  
plans.



North Orange County Community  
College District  
ATTN: Richard Williams  
1830 W. Romneya Drive  
Anaheim, California 92801

2018 MAY -7 AM 8:56

ANAHEIM COLLEGE  
FACILITIES M.C.D.



# **APPENDIX C**

## *Illumination Summary*





Sherbeck Field

Fullerton, CA

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Group
F1-F2	100'	25'	2	TLC-BT-575	1.15 kW	A
		100'	13	TLC-LED-1150	14.95 kW	A
		80'	2	TLC-LED-400	0.80 kW	B
F3-F4	120'	30'	2	TLC-BT-575	1.15 kW	A
		120'	15	TLC-LED-1150	17.25 kW	A
		80'	3	TLC-LED-400	1.20 kW	B
P1-P2	60'	60'	3	TLC-LED-1150	3.45 kW	C
6			80		79.90 kW	

Group Summary			
Group	Description	Load	Fixture Qty
A	Football	69.0 kW	64
B	Egress	4.0 kW	10
C	Track	6.9 kW	6

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1150	LED 5700K - 75 CRI	1150W	121,000	>51,000	>51,000	>51,000	62
TLC-LED-400	LED 5700K - 75 CRI	400W	38,600	61,000	>72,000	>72,000	10
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	--	--	--	8

Light Level Summary

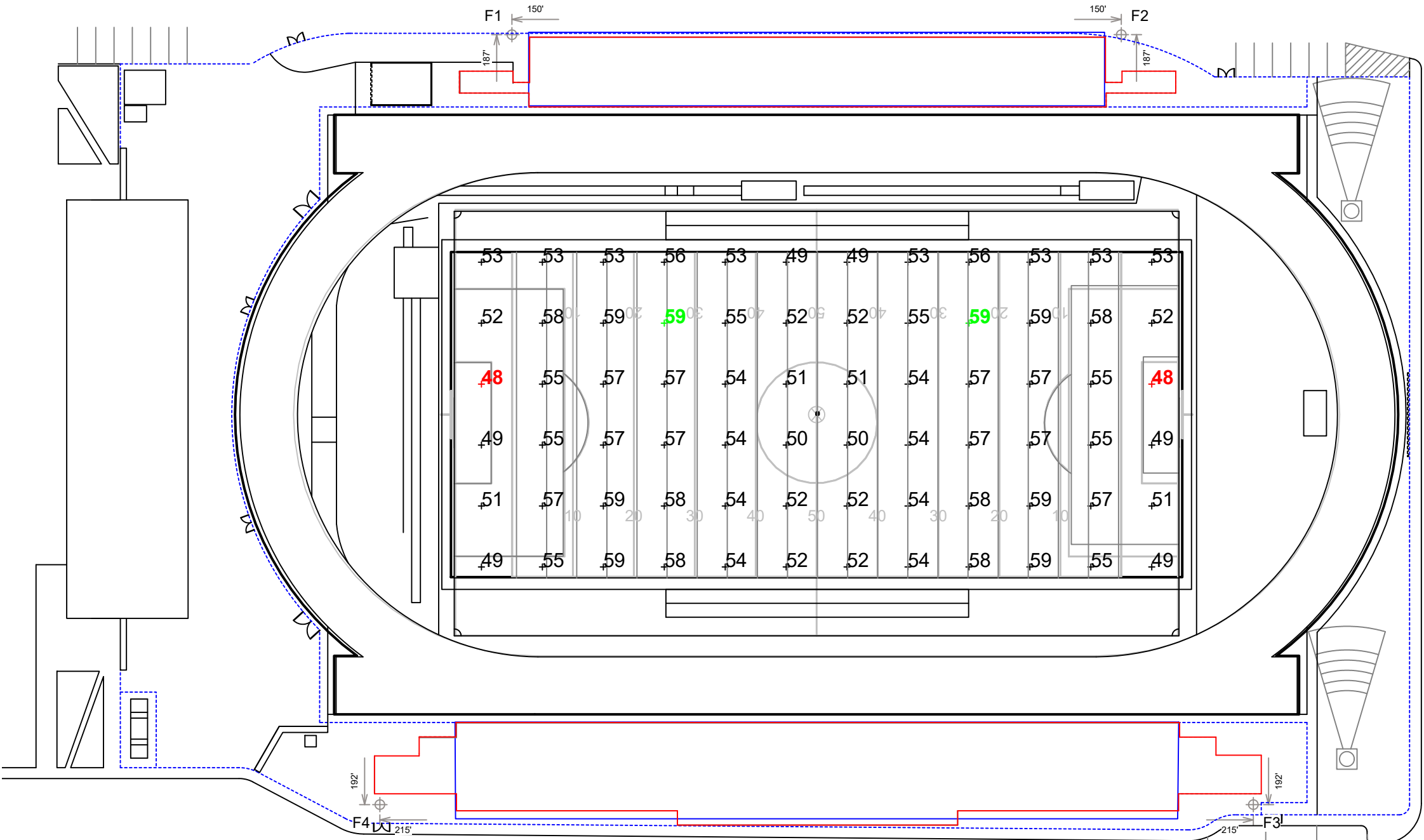
Calculation Grid Summary								
Grid Name	Calculation Metric	Illumination					Groups	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Away Egress	Horizontal Illuminance	7.40	3	12	4.48	2.47	B	10
Football	Horizontal Illuminance	54.3	48	59	1.23	1.13	A	64
Home Egress	Horizontal Illuminance	6.40	1	16	10.72	6.40	B	10
Soccer	Horizontal Illuminance	53.6	45	60	1.32	1.19	A	64
Spill	Horizontal	0.01	0	0.04	1569.64		A,B,C	80
Spill	Max Candela (by Fixture)	615	4.39	4245	966.69	140.02	A,B,C	80
Spill	Max Vertical Illuminance Metric	0.01	0	0.08	1546.06		A,B,C	80
Track	Horizontal Illuminance	31.5	18	44	2.51	1.75	A,C	70

From Hometown to Professional



We Make It Happen®

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	0	2
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	0	3
				120'	TLC-LED-1150	15	15	0
4	TOTALS					74	64	10



Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Football
Size:	360' x 160'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
<b>Guaranteed Average:</b>	<b>50</b>		
Scan Average:	54.3		
Maximum:	59		
Minimum:	48		
Avg / Min:	1.13		
<b>Guaranteed Max / Min:</b>	<b>2</b>		
Max / Min:	1.23		
UG (adjacent pts):	1.15		
No. of Points:	72		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	121,000 / 52,000 lumens		
<b>No. of Luminaires:</b>	<b>64</b>		
Total Load:	69.0 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-BT-575	--	--	--
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm$  3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

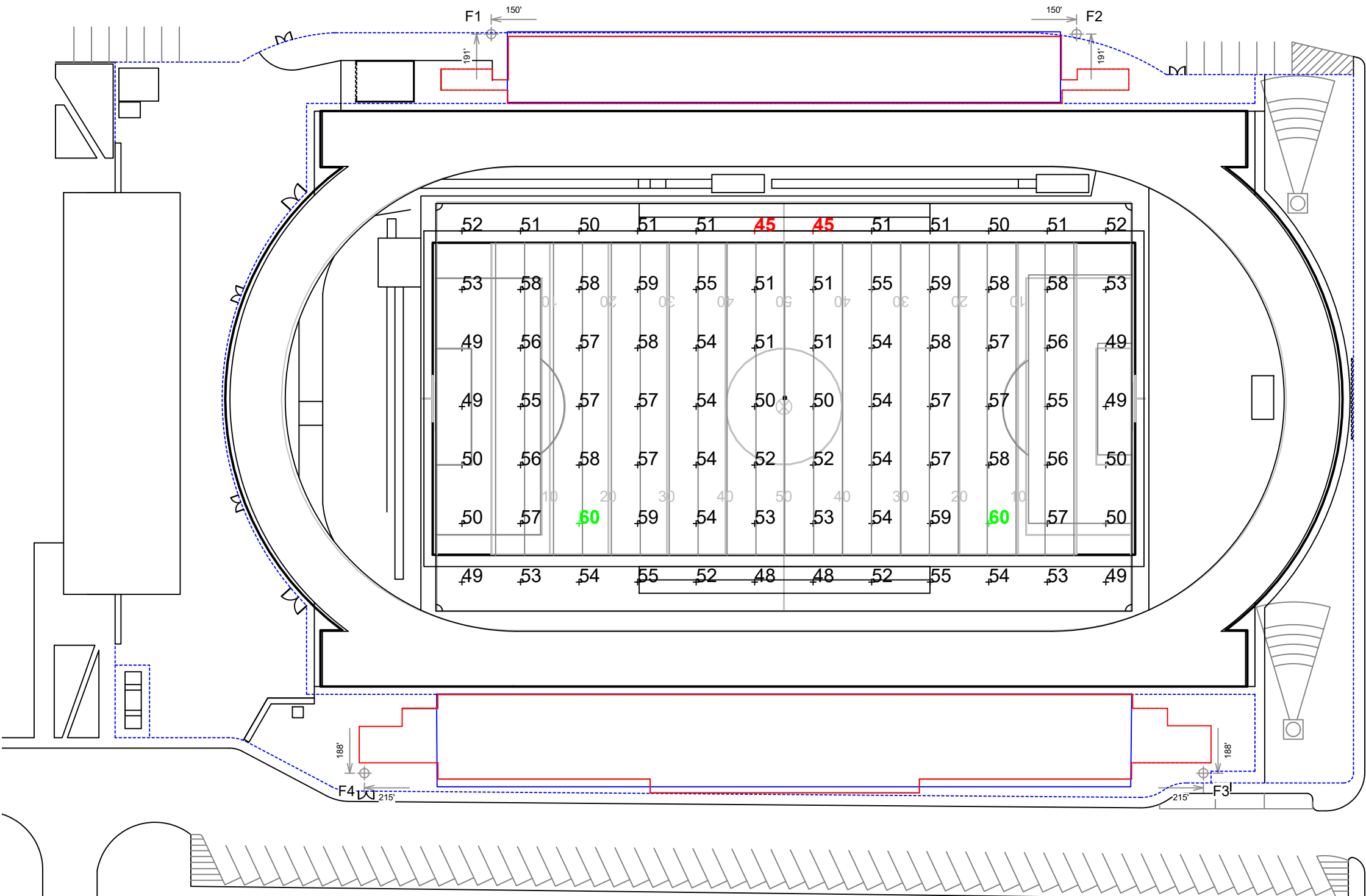


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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	0	2
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	0	3
				120'	TLC-LED-1150	15	15	0
4	TOTALS					74	64	10



## Sherbeck Field

Fullerton, CA

### GRID SUMMARY

Name: Soccer  
Size: 356' x 210'  
Spacing: 30.0' x 30.0'  
Height: 3.0' above grade

### ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

Entire Grid

Guaranteed Average: 50  
Scan Average: 53.6  
Maximum: 60  
Minimum: 45  
Avg / Min: 1.18  
Guaranteed Max / Min: 2  
Max / Min: 1.32  
UG (adjacent pts): 1.17  
No. of Points: 84

#### LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI  
Luminaire Output: 121,000 / 52,000 lumens  
No. of Luminaires: 64  
Total Load: 69.0 kW

#### Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-BT-575	--	--	--

Reported per TM-21-11. See luminaire datasheet for details.

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm 3\%$  nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

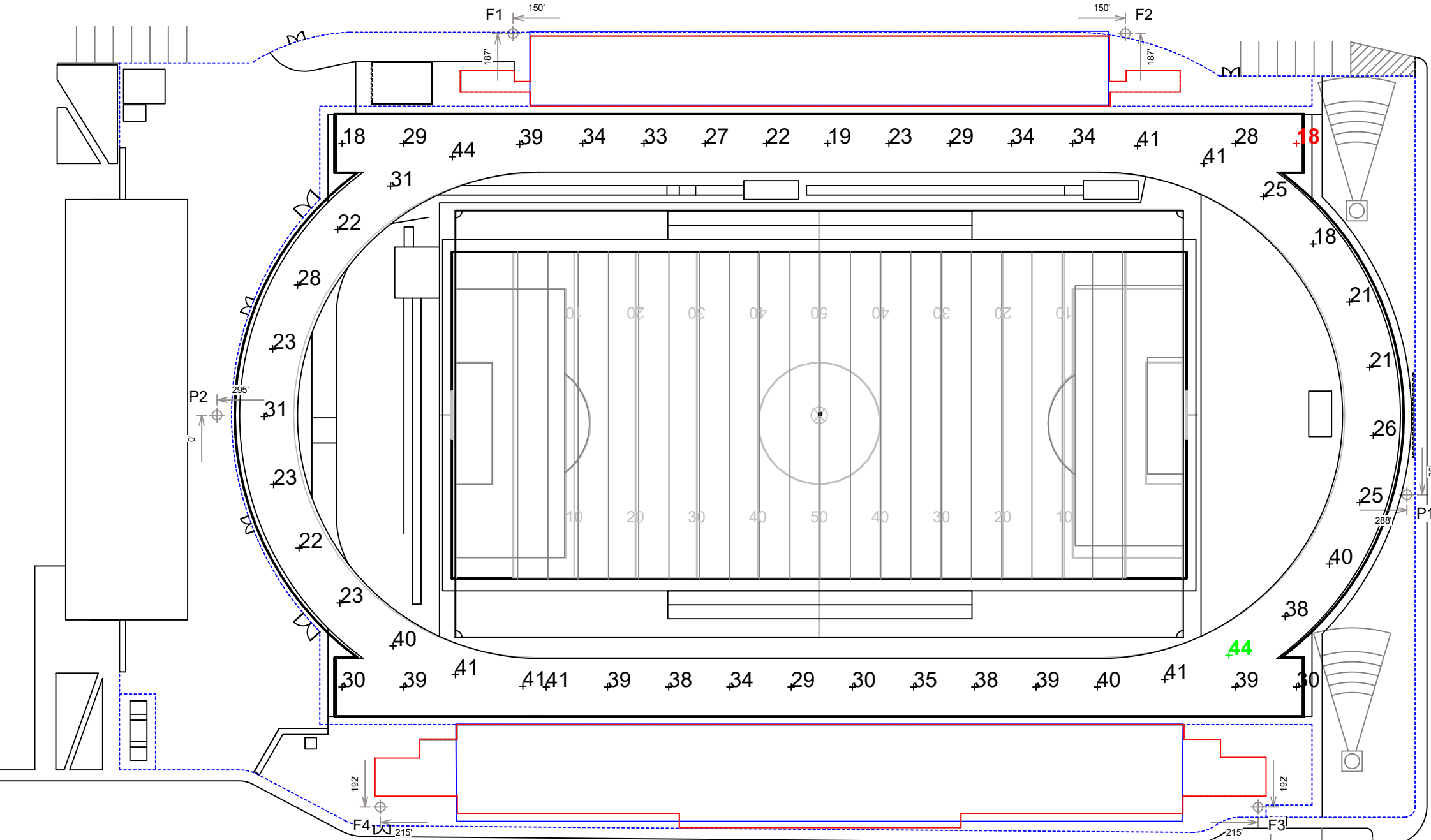


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### ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	0	2
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	0	3
				120'	TLC-LED-1150	15	15	0
2	P1-P2	60'	-	60'	TLC-LED-1150	3	3	0
6	TOTALS					80	70	10



Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Track
Size:	Irregular
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
<b>Guaranteed Average:</b>	<b>30</b>		
Scan Average:	31.5		
Maximum:	44		
Minimum:	18		
Avg / Min:	1.80		
<b>Guaranteed Max / Min:</b>	<b>3</b>		
Max / Min:	2.51		
UG (adjacent pts):	0.00		
No. of Points:	52		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	121,000 / 52,000 lumens		
<b>No. of Luminaires:</b>	<b>70</b>		
Total Load:	75.9 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-BT-575	--	--	--
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



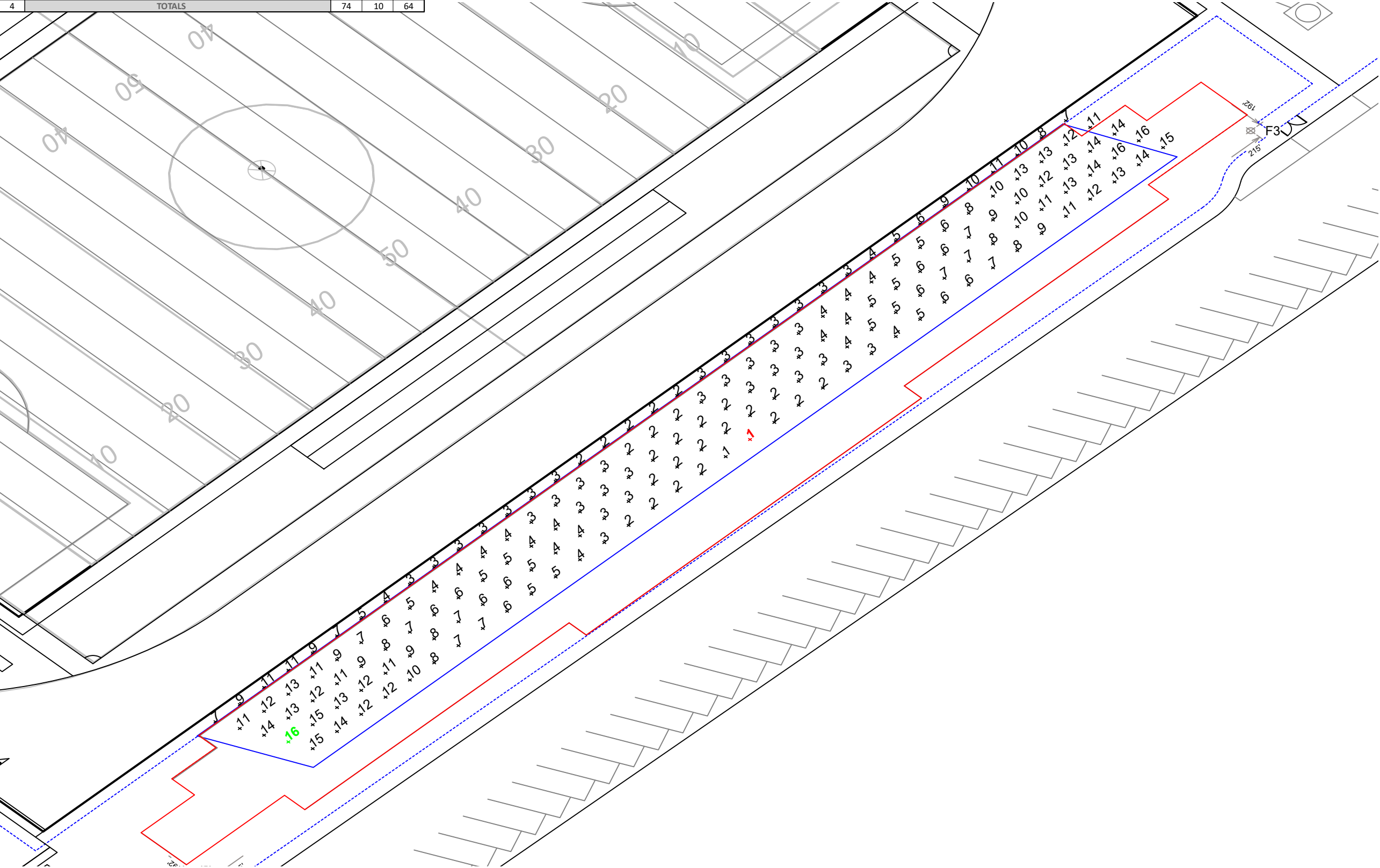
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ILLUMINATION SUMMARY



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	0	2
				80'	TLC-LED-400	2	2	0
				100'	TLC-LED-1150	13	0	13
2	F3-F4	120'	-	30'	TLC-BT-575	2	0	2
				80'	TLC-LED-400	3	3	0
				120'	TLC-LED-1150	15	0	15
4	TOTALS					74	10	64



Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Home Egress
Size:	1' x 1'
Spacing:	10.0' x 10.0'
Height:	21.3' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
Scan Average:	6.4		
Maximum:	16		
Minimum:	1		
Avg / Min:	4.31		
Max / Min:	10.72		
UG (adjacent pts):	0.00		
No. of Points:	180		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	38,600 lumens		
No. of Luminaires:	10		
Total Load:	4.0 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-400	61,000	>72,000	>72,000
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	0	2
				80'	TLC-LED-400	2	2	0
				100'	TLC-LED-1150	13	0	13
2	F3-F4	120'	-	30'	TLC-BT-575	2	0	2
				80'	TLC-LED-400	3	3	0
				120'	TLC-LED-1150	15	0	15
4	TOTALS					74	10	64

Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Away Egress
Size:	1' x 1'
Spacing:	10.0' x 10.0'
Height:	5.3' above grade

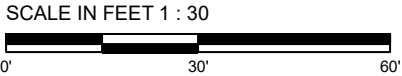
ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
Scan Average:	7.4		
Maximum:	12		
Minimum:	3		
Avg / Min:	2.79		
Max / Min:	4.48		
UG (adjacent pts):	0.00		
No. of Points:	112		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	38,600 lumens		
No. of Luminaires:	10		
Total Load:	4.0 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-400	61,000	>72,000	>72,000
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

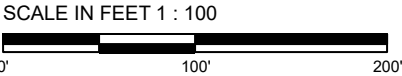
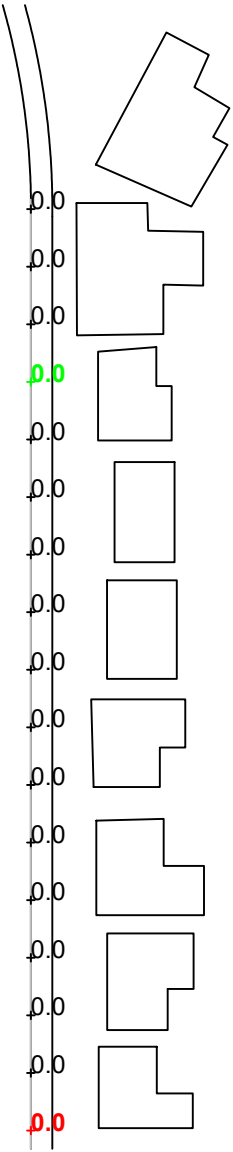
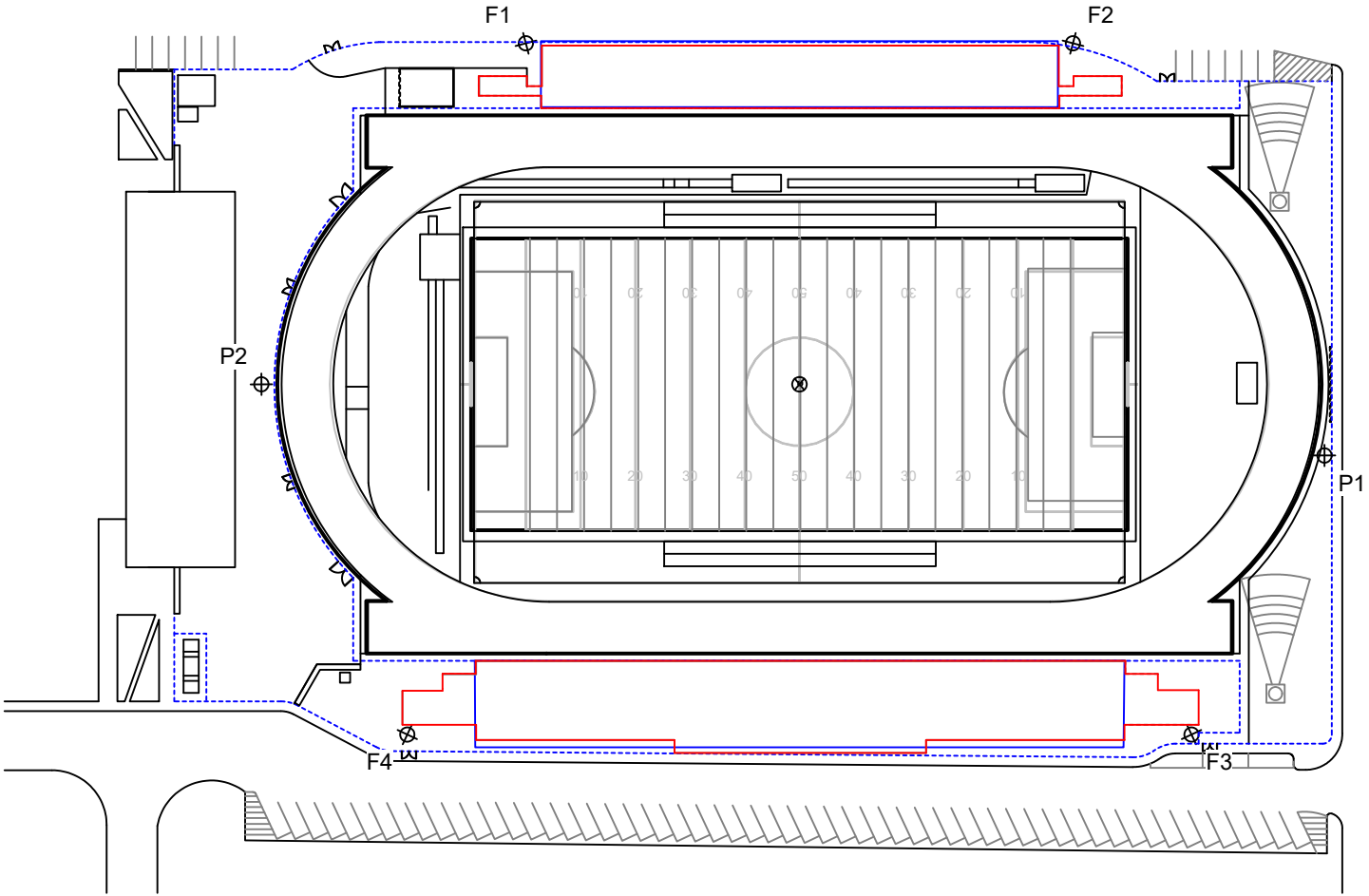
**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Pole location(s) ⚡ dimensions are relative to 0,0 reference point(s) ⊗



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	2	0
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	3	0
				120'	TLC-LED-1150	15	15	0
				60'	TLC-LED-1150	3	3	0
2	P1-P2	60'	-					
6	TOTALS					80	80	0



Pole location(s) ⚓ dimensions are relative to 0,0 reference point(s) ⊗

Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
Scan Average:	Entire Grid		
	0.006		
	Maximum:		
	0.04		
Minimum:	0.00		
No. of Points:	17		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	121,000 / 38,600 / 52,000 lumens		
No. of Luminaires:	80		
Total Load:	79.9 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-LED-400	61,000	>72,000	>72,000
TLC-BT-575	--	--	--
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

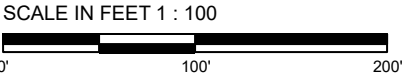
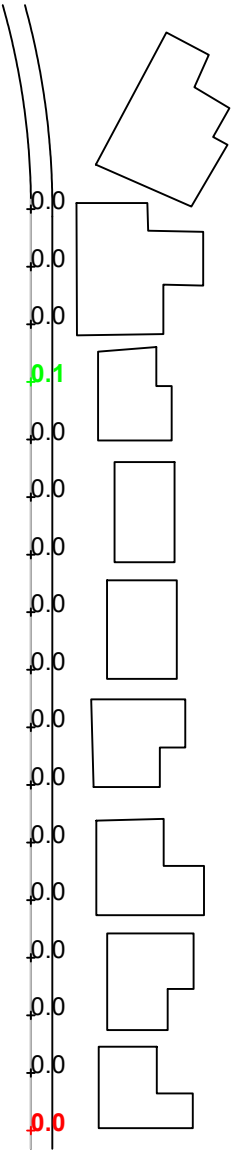
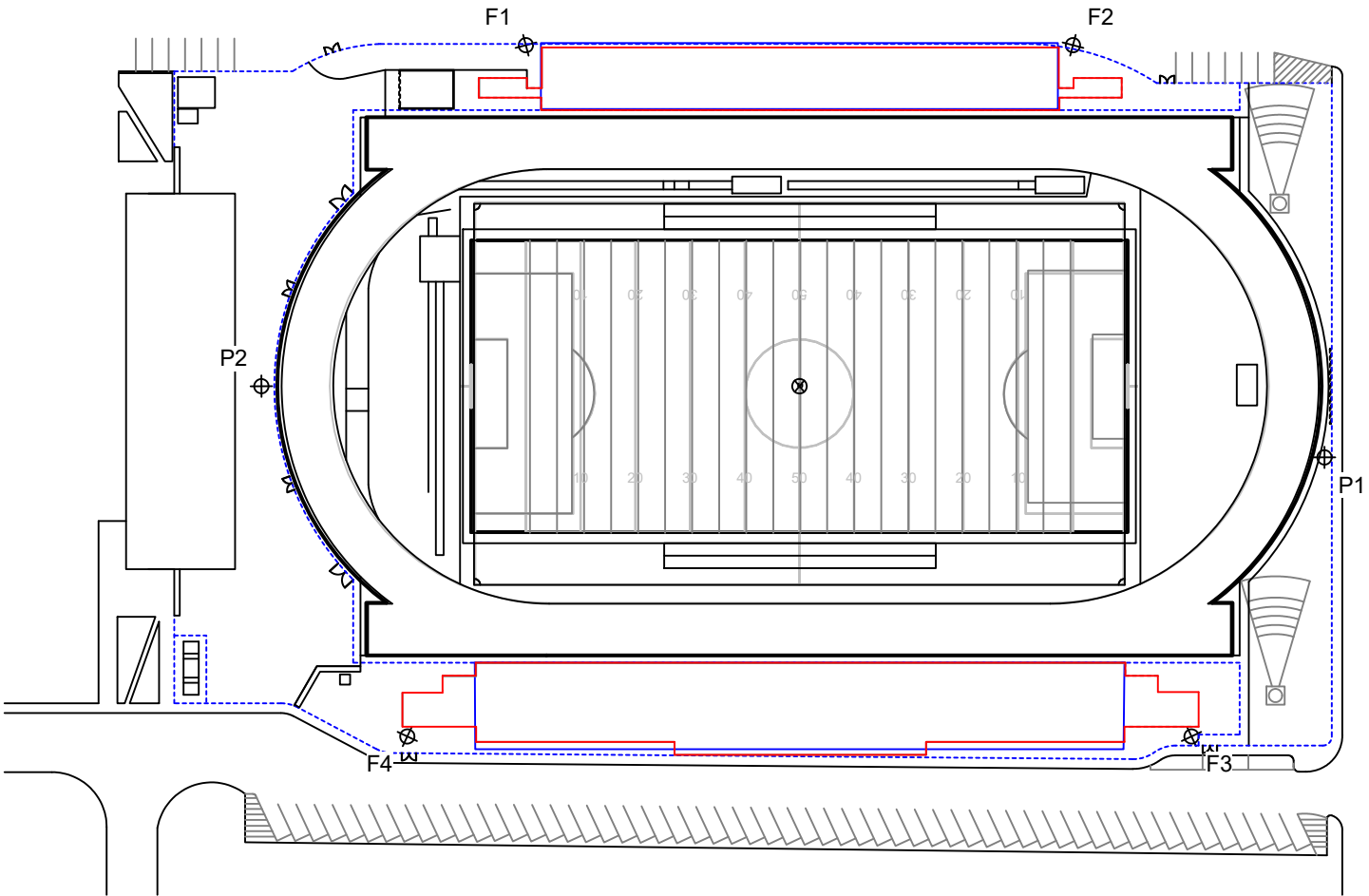


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ILLUMINATION SUMMARY



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	2	0
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	3	0
				120'	TLC-LED-1150	15	15	0
				60'	TLC-LED-1150	3	3	0
2	P1-P2	60'	-					
6	TOTALS					80	80	0



Pole location(s) ⦿ dimensions are relative to 0,0 reference point(s) ⊗

Sherbeck Field  
Fullerton, CA

GRID SUMMARY	
Name:	Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED MAX VERTICAL FOOTCANDLES			
Scan Average:	Entire Grid		
	0.014		
	Maximum: 0.08		
	Minimum: 0.00		
No. of Points:	17		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	121,000 / 38,600 / 52,000 lumens		
No. of Luminaires:	80		
Total Load:	79.9 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-LED-400	61,000	>72,000	>72,000
TLC-BT-575	--	--	--
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

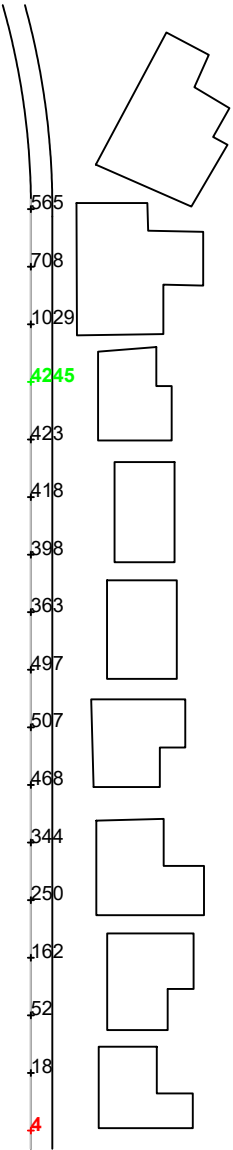
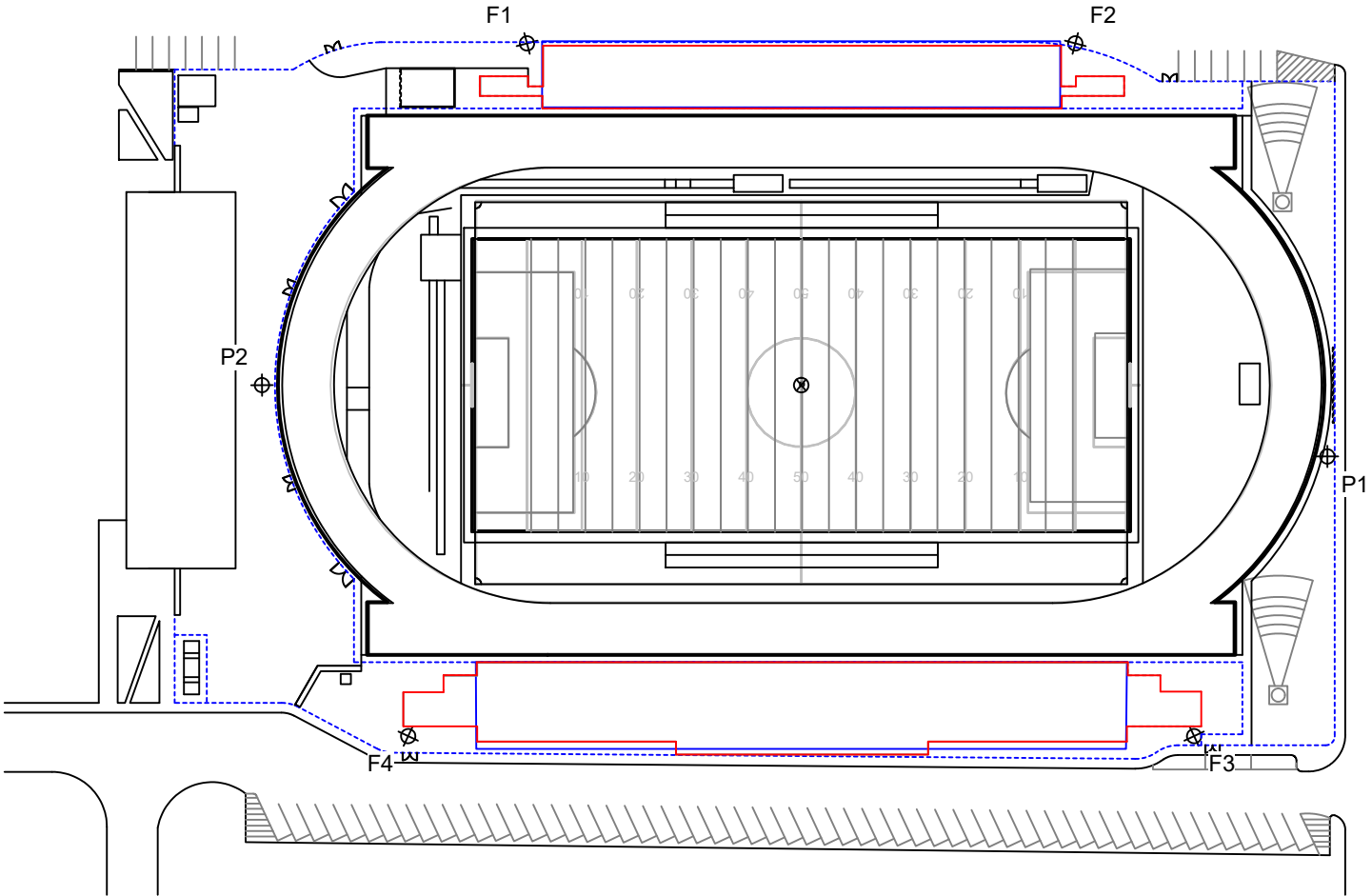
**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	F1-F2	100'	-	25'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	2	2	0
				100'	TLC-LED-1150	13	13	0
2	F3-F4	120'	-	30'	TLC-BT-575	2	2	0
				80'	TLC-LED-400	3	3	0
				120'	TLC-LED-1150	15	15	0
				60'	TLC-LED-1150	3	3	0
2	P1-P2	60'	-					
6	TOTALS					80	80	0



## Sherbeck Field

Fullerton, CA

GRID SUMMARY	
Name:	Spill
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED CANDELA (PER FIXTURE)			
	Entire Grid		
<b>Scan Average:</b>	<b>614.709</b>		
<b>Maximum:</b>	<b>4245.44</b>		
<b>Minimum:</b>	<b>4.39</b>		
<b>No. of Points:</b>	<b>17</b>		
LUMINAIRE INFORMATION			
<b>Color / CRI:</b>	5700K - 75 CRI		
<b>Luminaire Output:</b>	121,000 / 38,600 / 52,000 lumens		
<b>No. of Luminaires:</b>	<b>80</b>		
<b>Total Load:</b>	79.9 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>51,000	>51,000	>51,000
TLC-LED-400	61,000	>72,000	>72,000
TLC-BT-575	--	--	--
Reported per TM-21-11. See luminaire datasheet for details.			

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm$  3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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## ILLUMINATION SUMMARY

SCALE IN FEET 1 : 100



Pole location(s) ⚡ dimensions are relative to 0,0 reference point(s) ⊗

Sherbeck Field  
Fullerton, CA

EQUIPMENT LAYOUT

**INCLUDES:**

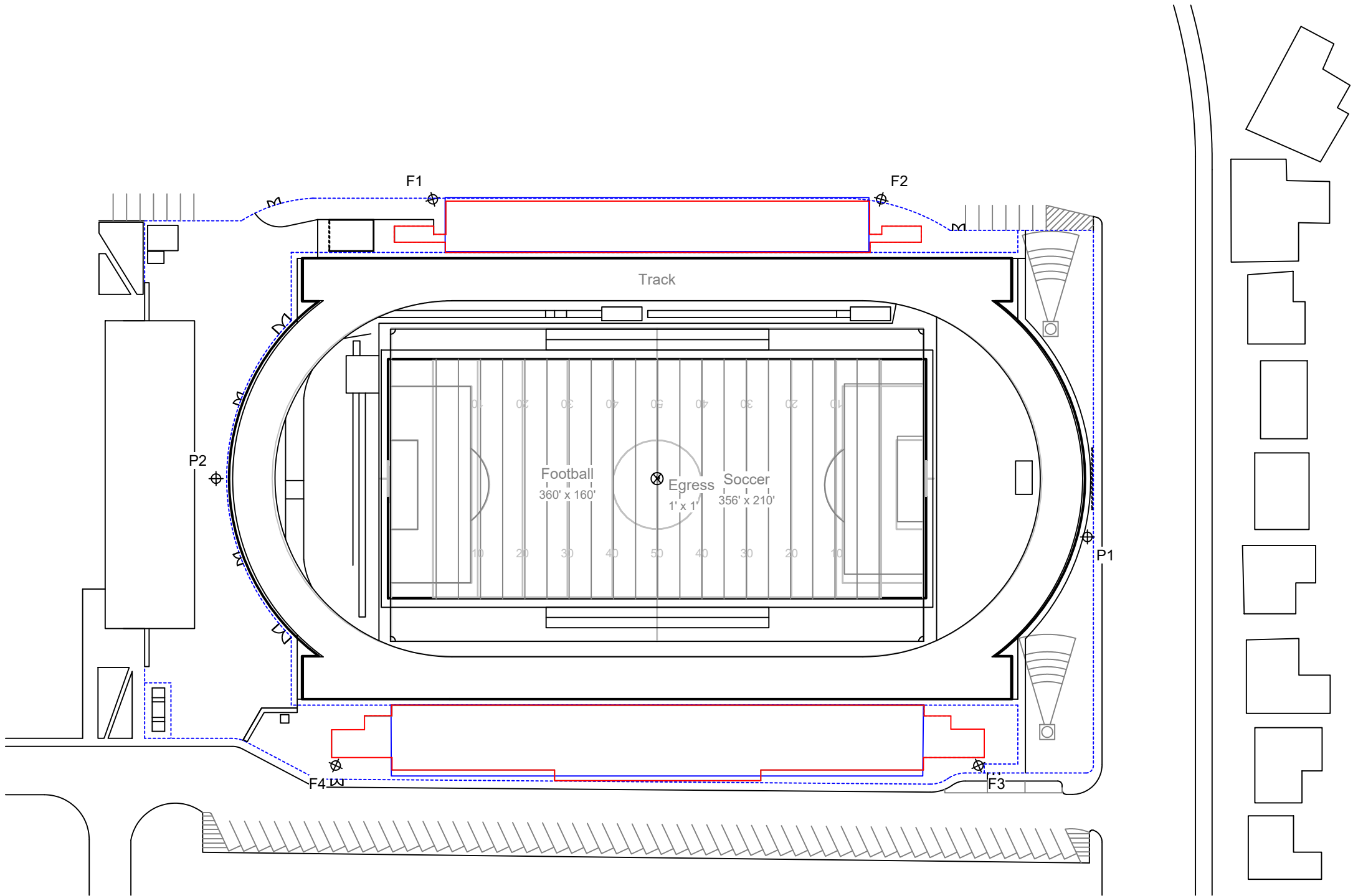
- Egress
- Football
- Soccer
- Track

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN						
Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
2	F1-F2	100'	-	25'	TLC-BT-575	2
				80'	TLC-LED-400	2
				100'	TLC-LED-1150	13
2	F3-F4	120'	-	30'	TLC-BT-575	2
				80'	TLC-LED-400	3
				120'	TLC-LED-1150	15
2	P1-P2	60'	-	60'	TLC-LED-1150	3
6	TOTALS					80

SINGLE LUMINAIRE AMPERAGE DRAW CHART							
Ballast Specifications (.90 min power factor)		Line Amperage Per Luminaire (max draw)					
Single Phase Voltage		208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	480 (60)
TLC-LED-1150		6.8	6.5	5.9	5.1	4.1	3.7
TLC-LED-400		2.5	2.3	2.1	1.9	1.5	1.4
TLC-BT-575		3.2	3.0	2.8	2.4	1.9	1.4



## Fullerton, CA

## Summary

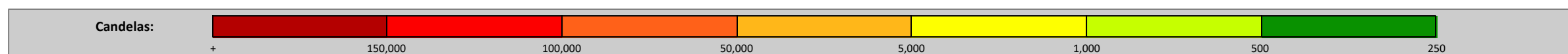
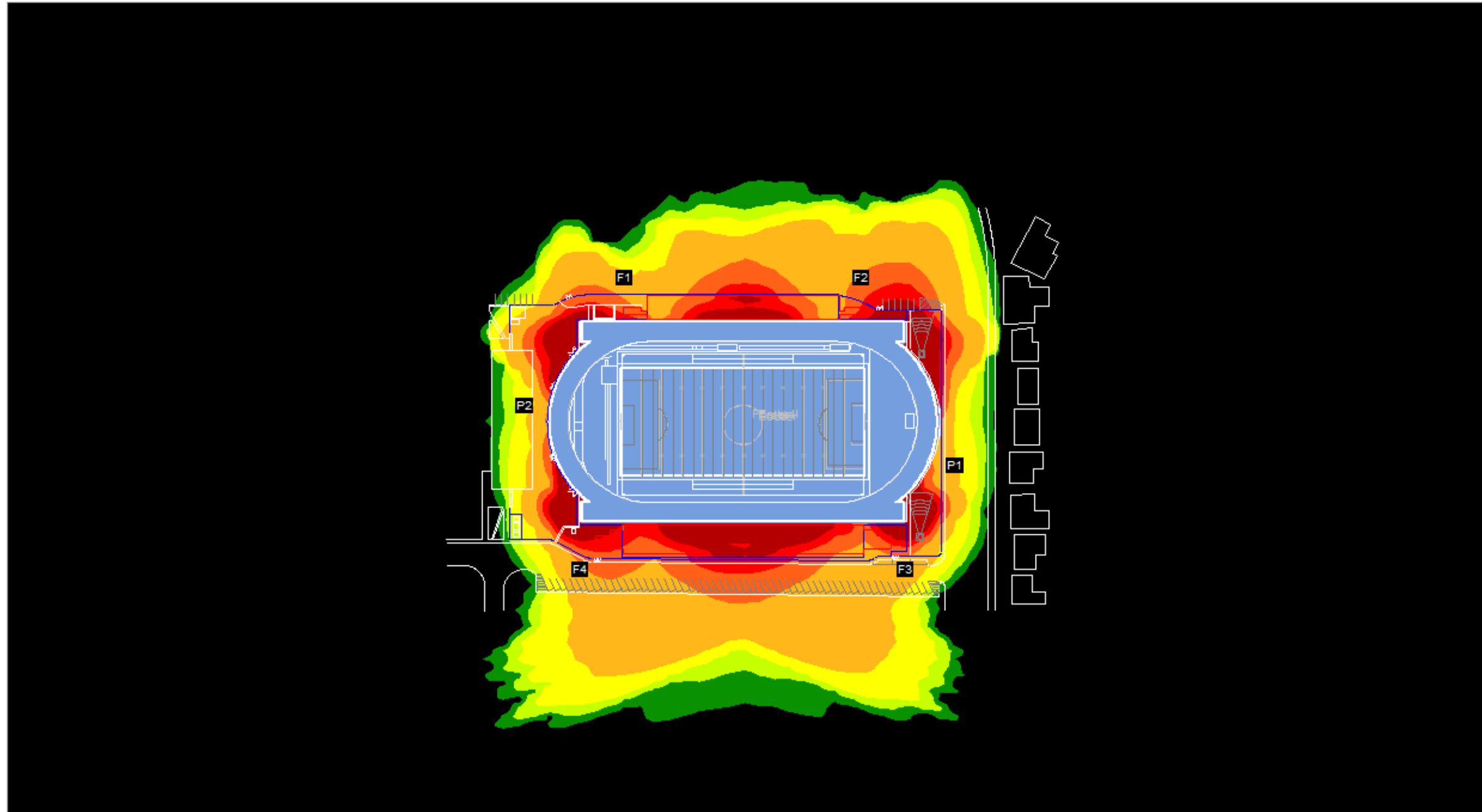
A well-designed lighting system controls light to provide maximum useful on-field illumination with minimal destructive off-site glare.

## Candela Levels

Should only occur on or very near the lit area where the light source is in direct view. Care must be taken to minimize high glare zones.

Equivalent to high beam headlights of a car.

Equivalent to 100W incandescent light bulb.



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**ENGINEERED DESIGN** By: Daniel Lohman • File #181487e • 18-Jan-18

## ENVIRONMENTAL GLARE IMPACT



# **APPENDIX D**

## ***Air Quality and Greenhouse Gas Emissions Modeling Runs***



Sherbeck Field - South Coast AQMD Air District, Annual

**Sherbeck Field**  
**South Coast AQMD Air District, Annual**

**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Arena	4.36	Acre	4.36	1,100.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	31
<b>Climate Zone</b>	8			<b>Operational Year</b>	2020
<b>Utility Company</b>	Southern California Edison				
<b>CO2 Intensity (lb/MW hr)</b>	604.92	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Operational Year 2020. CO2 intensity factor was adjusted to account for SCE's compliance with the RPS.

Land Use - Project acreage: 4.36. The project would include development of a press box and storage building, totaling 1,100 square feet. No other buildings are proposed.

Construction Phase - Construction Phasing was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

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Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.



Trips and VMT - Number of trips for worker and vendor trucks was based on information provided by the project applicant.

Demolition - None required.

Architectural Coating - Default values.

Vehicle Trips - Trip generation rates from the project's traffic impact study were used in place of CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	1,650.00	1,165.00
tblAreaCoating	Area_Nonresidential_Exterior	550	94961
tblAreaCoating	Area_Nonresidential_Interior	1650	284883
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	18.00	5.00
tblConstructionPhase	NumDays	230.00	76.00
tblConstructionPhase	NumDays	18.00	10.00
tblEnergyUse	LightingElect	2.99	3.62
tblEnergyUse	NT24E	3.83	3.85
tblLandUse	LandUseSquareFeet	189,921.60	1,100.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	604.92
tblTripsAndVMT	VendorTripNumber	0.00	32.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	80.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblVehicleTrips	ST_TR	0.00	952.00
tblVehicleTrips	WD_TR	33.33	145.00

## 2.0 Emissions Summary

---

### 2.1 Overall Construction

#### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1246	1.0846	0.9728	1.9700e-003	0.0891	0.0549	0.1440	0.0367	0.0514	0.0881	0.0000	175.0094	175.0094	0.0321	0.0000	175.8106
Maximum	0.1246	1.0846	0.9728	1.9700e-003	0.0891	0.0549	0.1440	0.0367	0.0514	0.0881	0.0000	175.0094	175.0094	0.0321	0.0000	175.8106

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1246	1.0846	0.9728	1.9700e-003	0.0615	0.0549	0.1164	0.0215	0.0514	0.0729	0.0000	175.0093	175.0093	0.0321	0.0000	175.8104
Maximum	0.1246	1.0846	0.9728	1.9700e-003	0.0615	0.0549	0.1164	0.0215	0.0514	0.0729	0.0000	175.0093	175.0093	0.0321	0.0000	175.8104

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	30.92	0.00	19.13	41.31	0.00	17.19	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	0.9230	0.9230
2	4-1-2020	6-30-2020	0.2810	0.2810
		Highest	0.9230	0.9230

## 2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0920	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	3.9735	3.9735	1.6000e-004	5.0000e-005	3.9922
Mobile	0.3003	1.5664	3.4430	0.0111	0.8567	0.0114	0.8681	0.2296	0.0107	0.2403	0.0000	1,025.5645	1,025.5645	0.0564	0.0000	1,026.9747
Waste						0.0000	0.0000		0.0000	0.0000	0.0751	0.0000	0.0751	4.4400e-003	0.0000	0.1861
Water						0.0000	0.0000		0.0000	0.0000	1.8620	22.1116	23.9737	0.1923	4.7400e-003	30.1925
Total	0.3924	1.5675	3.4440	0.0111	0.8567	0.0115	0.8682	0.2296	0.0108	0.2404	1.9372	1,051.6497	1,053.5868	0.2533	4.7900e-003	1,061.3456

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0920	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	3.9735	3.9735	1.6000e-004	5.0000e-005	3.9922
Mobile	0.3003	1.5664	3.4430	0.0111	0.8567	0.0114	0.8681	0.2296	0.0107	0.2403	0.0000	1,025.5645	1,025.5645	0.0564	0.0000	1,026.9747
Waste						0.0000	0.0000		0.0000	0.0000	0.0751	0.0000	0.0751	4.4400e-003	0.0000	0.1861
Water						0.0000	0.0000		0.0000	0.0000	1.8620	22.1116	23.9737	0.1923	4.7400e-003	30.1925
Total	0.3924	1.5675	3.4440	0.0111	0.8567	0.0115	0.8682	0.2296	0.0108	0.2404	1.9372	1,051.6497	1,053.5868	0.2533	4.7900e-003	1,061.3456

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

### 3.0 Construction Detail

#### Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/9/2020	1/15/2020	5	5	
2	Trenching	Trenching	1/16/2020	2/12/2020	5	20	
3	Building Construction	Building Construction	1/16/2020	4/30/2020	5	76	
4	Paving	Paving	2/1/2020	2/14/2020	5	10	
5	Architectural Coating	Architectural Coating	4/24/2020	4/30/2020	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,165; Non-Residential Outdoor: 550; Striped Parking Area: 0

#### OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

### Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	80.00	32.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

### 3.2 Site Preparation - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4253

Total	0.0102	0.1060	0.0538	1.0000e-004	0.0452	5.4900e-003	0.0507	0.0248	5.0500e-003	0.0299	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4253
-------	--------	--------	--------	-------------	--------	-------------	--------	--------	-------------	--------	--------	--------	--------	-------------	--------	--------

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.7000e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4445	0.4445	1.0000e-005	0.0000	0.4448
Total	2.0000e-004	1.5000e-004	1.7000e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4445	0.4445	1.0000e-005	0.0000	0.4448

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0176	0.0000	0.0176	9.6800e-003	0.0000	9.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0102	0.1060	0.0538	1.0000e-004		5.4900e-003	5.4900e-003		5.0500e-003	5.0500e-003	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4252
Total	0.0102	0.1060	0.0538	1.0000e-004	0.0176	5.4900e-003	0.0231	9.6800e-003	5.0500e-003	0.0147	0.0000	8.3577	8.3577	2.7000e-003	0.0000	8.4252

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.5000e-004	1.7000e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4445	0.4445	1.0000e-005	0.0000	0.4448
Total	2.0000e-004	1.5000e-004	1.7000e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4445	0.4445	1.0000e-005	0.0000	0.4448

### 3.3 Trenching - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.5400e-003	0.0452	0.0555	8.0000e-005		2.5000e-003	2.5000e-003		2.3000e-003	2.3000e-003	0.0000	7.2655	7.2655	2.3500e-003	0.0000	7.3243
Total	4.5400e-003	0.0452	0.0555	8.0000e-005		2.5000e-003	2.5000e-003		2.3000e-003	2.3000e-003	0.0000	7.2655	7.2655	2.3500e-003	0.0000	7.3243

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.7000e-004	3.0300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7901	0.7901	2.0000e-005	0.0000	0.7907
<b>Total</b>	<b>3.6000e-004</b>	<b>2.7000e-004</b>	<b>3.0300e-003</b>	<b>1.0000e-005</b>	<b>8.8000e-004</b>	<b>1.0000e-005</b>	<b>8.8000e-004</b>	<b>2.3000e-004</b>	<b>1.0000e-005</b>	<b>2.4000e-004</b>	<b>0.0000</b>	<b>0.7901</b>	<b>0.7901</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.7907</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.5400e-003	0.0452	0.0555	8.0000e-005		2.5000e-003	2.5000e-003		2.3000e-003	2.3000e-003	0.0000	7.2655	7.2655	2.3500e-003	0.0000	7.3243
<b>Total</b>	<b>4.5400e-003</b>	<b>0.0452</b>	<b>0.0555</b>	<b>8.0000e-005</b>		<b>2.5000e-003</b>	<b>2.5000e-003</b>		<b>2.3000e-003</b>	<b>2.3000e-003</b>	<b>0.0000</b>	<b>7.2655</b>	<b>7.2655</b>	<b>2.3500e-003</b>	<b>0.0000</b>	<b>7.3243</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.7000e-004	3.0300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7901	0.7901	2.0000e-005	0.0000	0.7907
<b>Total</b>	<b>3.6000e-004</b>	<b>2.7000e-004</b>	<b>3.0300e-003</b>	<b>1.0000e-005</b>	<b>8.8000e-004</b>	<b>1.0000e-005</b>	<b>8.8000e-004</b>	<b>2.3000e-004</b>	<b>1.0000e-005</b>	<b>2.4000e-004</b>	<b>0.0000</b>	<b>0.7901</b>	<b>0.7901</b>	<b>2.0000e-005</b>	<b>0.0000</b>	<b>0.7907</b>



### 3.4 Building Construction - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0806	0.7291	0.6402	1.0200e-003		0.0425	0.0425		0.0399	0.0399	0.0000	88.0118	88.0118	0.0215	0.0000	88.5486
<b>Total</b>	<b>0.0806</b>	<b>0.7291</b>	<b>0.6402</b>	<b>1.0200e-003</b>		<b>0.0425</b>	<b>0.0425</b>		<b>0.0399</b>	<b>0.0399</b>	<b>0.0000</b>	<b>88.0118</b>	<b>88.0118</b>	<b>0.0215</b>	<b>0.0000</b>	<b>88.5486</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0700e-003	0.1298	0.0321	3.1000e-004	7.6600e-003	6.4000e-004	8.3000e-003	2.2100e-003	6.1000e-004	2.8200e-003	0.0000	29.9078	29.9078	1.9600e-003	0.0000	29.9568
Worker	0.0136	0.0104	0.1151	3.3000e-004	0.0334	2.6000e-004	0.0336	8.8600e-003	2.4000e-004	9.1000e-003	0.0000	30.0251	30.0251	8.6000e-004	0.0000	30.0466
<b>Total</b>	<b>0.0176</b>	<b>0.1402</b>	<b>0.1473</b>	<b>6.4000e-004</b>	<b>0.0410</b>	<b>9.0000e-004</b>	<b>0.0419</b>	<b>0.0111</b>	<b>8.5000e-004</b>	<b>0.0119</b>	<b>0.0000</b>	<b>59.9328</b>	<b>59.9328</b>	<b>2.8200e-003</b>	<b>0.0000</b>	<b>60.0034</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0806	0.7291	0.6402	1.0200e-003		0.0425	0.0425		0.0399	0.0399	0.0000	88.0117	88.0117	0.0215	0.0000	88.5485
<b>Total</b>	<b>0.0806</b>	<b>0.7291</b>	<b>0.6402</b>	<b>1.0200e-003</b>		<b>0.0425</b>	<b>0.0425</b>		<b>0.0399</b>	<b>0.0399</b>	<b>0.0000</b>	<b>88.0117</b>	<b>88.0117</b>	<b>0.0215</b>	<b>0.0000</b>	<b>88.5485</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0700e-003	0.1298	0.0321	3.1000e-004	7.6600e-003	6.4000e-004	8.3000e-003	2.2100e-003	6.1000e-004	2.8200e-003	0.0000	29.9078	29.9078	1.9600e-003	0.0000	29.9568
Worker	0.0136	0.0104	0.1151	3.3000e-004	0.0334	2.6000e-004	0.0336	8.8600e-003	2.4000e-004	9.1000e-003	0.0000	30.0251	30.0251	8.6000e-004	0.0000	30.0466
<b>Total</b>	<b>0.0176</b>	<b>0.1402</b>	<b>0.1473</b>	<b>6.4000e-004</b>	<b>0.0410</b>	<b>9.0000e-004</b>	<b>0.0419</b>	<b>0.0111</b>	<b>8.5000e-004</b>	<b>0.0119</b>	<b>0.0000</b>	<b>59.9328</b>	<b>59.9328</b>	<b>2.8200e-003</b>	<b>0.0000</b>	<b>60.0034</b>

### 3.5 Paving - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9200e-003	0.0590	0.0614	9.0000e-005		3.2500e-003	3.2500e-003		3.0000e-003	3.0000e-003	0.0000	8.1860	8.1860	2.5700e-003	0.0000	8.2503

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>5.9200e-003</b>	<b>0.0590</b>	<b>0.0614</b>	<b>9.0000e-005</b>		<b>3.2500e-003</b>	<b>3.2500e-003</b>		<b>3.0000e-003</b>	<b>3.0000e-003</b>	<b>0.0000</b>	<b>8.1860</b>	<b>8.1860</b>	<b>2.5700e-003</b>	<b>0.0000</b>	<b>8.2503</b>

### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.4000e-004	3.7900e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.9877	0.9877	3.0000e-005	0.0000	0.9884
<b>Total</b>	<b>4.5000e-004</b>	<b>3.4000e-004</b>	<b>3.7900e-003</b>	<b>1.0000e-005</b>	<b>1.1000e-003</b>	<b>1.0000e-005</b>	<b>1.1100e-003</b>	<b>2.9000e-004</b>	<b>1.0000e-005</b>	<b>3.0000e-004</b>	<b>0.0000</b>	<b>0.9877</b>	<b>0.9877</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.9884</b>

### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9200e-003	0.0590	0.0614	9.0000e-005		3.2500e-003	3.2500e-003		3.0000e-003	3.0000e-003	0.0000	8.1860	8.1860	2.5700e-003	0.0000	8.2503
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>5.9200e-003</b>	<b>0.0590</b>	<b>0.0614</b>	<b>9.0000e-005</b>		<b>3.2500e-003</b>	<b>3.2500e-003</b>		<b>3.0000e-003</b>	<b>3.0000e-003</b>	<b>0.0000</b>	<b>8.1860</b>	<b>8.1860</b>	<b>2.5700e-003</b>	<b>0.0000</b>	<b>8.2503</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.4000e-004	3.7900e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.9877	0.9877	3.0000e-005	0.0000	0.9884
<b>Total</b>	<b>4.5000e-004</b>	<b>3.4000e-004</b>	<b>3.7900e-003</b>	<b>1.0000e-005</b>	<b>1.1000e-003</b>	<b>1.0000e-005</b>	<b>1.1100e-003</b>	<b>2.9000e-004</b>	<b>1.0000e-005</b>	<b>3.0000e-004</b>	<b>0.0000</b>	<b>0.9877</b>	<b>0.9877</b>	<b>3.0000e-005</b>	<b>0.0000</b>	<b>0.9884</b>

### 3.6 Architectural Coating - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	4.2100e-003	4.5800e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
<b>Total</b>	<b>4.5800e-003</b>	<b>4.2100e-003</b>	<b>4.5800e-003</b>	<b>1.0000e-005</b>		<b>2.8000e-004</b>	<b>2.8000e-004</b>		<b>2.8000e-004</b>	<b>2.8000e-004</b>	<b>0.0000</b>	<b>0.6383</b>	<b>0.6383</b>	<b>5.0000e-005</b>	<b>0.0000</b>	<b>0.6396</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
<b>Total</b>	<b>1.8000e-004</b>	<b>1.4000e-004</b>	<b>1.5100e-003</b>	<b>0.0000</b>	<b>4.4000e-004</b>	<b>0.0000</b>	<b>4.4000e-004</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.3951</b>	<b>0.3951</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.3954</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	4.2100e-003	4.5800e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	0.6383	0.6383	5.0000e-005	0.0000	0.6396
<b>Total</b>	<b>4.5800e-003</b>	<b>4.2100e-003</b>	<b>4.5800e-003</b>	<b>1.0000e-005</b>		<b>2.8000e-004</b>	<b>2.8000e-004</b>		<b>2.8000e-004</b>	<b>2.8000e-004</b>	<b>0.0000</b>	<b>0.6383</b>	<b>0.6383</b>	<b>5.0000e-005</b>	<b>0.0000</b>	<b>0.6396</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.4000e-004	1.5100e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3951	0.3951	1.0000e-005	0.0000	0.3954
<b>Total</b>	<b>1.8000e-004</b>	<b>1.4000e-004</b>	<b>1.5100e-003</b>	<b>0.0000</b>	<b>4.4000e-004</b>	<b>0.0000</b>	<b>4.4000e-004</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.3951</b>	<b>0.3951</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>0.3954</b>

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3003	1.5664	3.4430	0.0111	0.8567	0.0114	0.8681	0.2296	0.0107	0.2403	0.0000	1,025.5645	1,025.5645	0.0564	0.0000	1,026.9747
Unmitigated	0.3003	1.5664	3.4430	0.0111	0.8567	0.0114	0.8681	0.2296	0.0107	0.2403	0.0000	1,025.5645	1,025.5645	0.0564	0.0000	1,026.9747

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Arena	632.20	4,150.72	0.00	2,254,623	2,254,623
Total	632.20	4,150.72	0.00	2,254,623	2,254,623

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Arena	16.60	8.40	6.90	0.00	81.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Arena	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2.7466	2.7466	1.3000e-004	3.0000e-005	2.7580
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2.7466	2.7466	1.3000e-004	3.0000e-005	2.7580
NaturalGas Mitigated	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341
NaturalGas Unmitigated	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Arena	22990	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341
Total		1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Arena	22990	1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341
Total		1.2000e-004	1.1300e-003	9.5000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.2268	1.2268	2.0000e-005	2.0000e-005	1.2341

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Arena	10010	2.7466	1.3000e-004	3.0000e-005	2.7580
Total		2.7466	1.3000e-004	3.0000e-005	2.7580

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
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Consumer Products	3.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
<b>Total</b>	<b>0.0920</b>	<b>0.0000</b>	<b>6.0000e-005</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>1.1000e-004</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.0000</b>	<b>1.2000e-004</b>

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0880					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.9700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
<b>Total</b>	<b>0.0920</b>	<b>0.0000</b>	<b>6.0000e-005</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>1.1000e-004</b>	<b>1.1000e-004</b>	<b>0.0000</b>	<b>0.0000</b>	<b>1.2000e-004</b>

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	23.9737	0.1923	4.7400e-003	30.1925
Unmitigated	23.9737	0.1923	4.7400e-003	30.1925

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Arena	5.86924 / 0.374633	23.9737	0.1923	4.7400e-003	30.1925
Total		23.9737	0.1923	4.7400e-003	30.1925

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Arena	5.86924 / 0.374633	23.9737	0.1923	4.7400e-003	30.1925
Total		23.9737	0.1923	4.7400e-003	30.1925

8.0 Waste Detail

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8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0751	4.4400e-003	0.0000	0.1861
Unmitigated	0.0751	4.4400e-003	0.0000	0.1861

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Arena	0.37	0.0751	4.4400e-003	0.0000	0.1861
Total		0.0751	4.4400e-003	0.0000	0.1861

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Arena	0.37	0.0751	4.4400e-003	0.0000	0.1861
Total		0.0751	4.4400e-003	0.0000	0.1861

9.0 Operational Offroad

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Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

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Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

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Sherbeck Field - South Coast AQMD Air District, Summer

**Sherbeck Field**  
**South Coast AQMD Air District, Summer**

**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Arena	4.36	Acre	4.36	1,100.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	31
<b>Climate Zone</b>	8			<b>Operational Year</b>	2020
<b>Utility Company</b>	Southern California Edison				
<b>CO2 Intensity (lb/MW hr)</b>	604.92	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Operational Year 2020. CO2 intensity factor was adjusted to account for SCE's compliance with the RPS.

Land Use - Project acreage: 4.36. The project would include development of a press box and storage building, totaling 1,100 square feet. No other buildings are proposed.

Construction Phase - Construction Phasing was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Trips and VMT - Number of trips for worker and vendor trucks was based on information provided by the project applicant.

Demolition - None required.

Architectural Coating - Default values.

Vehicle Trips - Trip generation rates from the project's traffic impact study were used in place of CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	1,650.00	1,165.00
tblAreaCoating	Area_Nonresidential_Exterior	550	94961
tblAreaCoating	Area_Nonresidential_Interior	1650	284883
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	18.00	5.00
tblConstructionPhase	NumDays	230.00	76.00
tblConstructionPhase	NumDays	18.00	10.00
tblEnergyUse	LightingElect	2.99	3.62
tblEnergyUse	NT24E	3.83	3.85
tblLandUse	LandUseSquareFeet	189,921.60	1,100.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	604.92
tblTripsAndVMT	VendorTripNumber	0.00	32.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	80.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblVehicleTrips	ST_TR	0.00	952.00
tblVehicleTrips	WD_TR	33.33	145.00

## 2.0 Emissions Summary

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### 2.1 Overall Construction (Maximum Daily Emission)

#### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.4913	42.4721	39.8931	0.0747	18.2675	2.1989	20.4664	9.9840	2.0230	12.0071	0.0000	7,272.8629	7,272.8629	1.5396	0.0000	7,311.3528
Maximum	4.4913	42.4721	39.8931	0.0747	18.2675	2.1989	20.4664	9.9840	2.0230	12.0071	0.0000	7,272.8629	7,272.8629	1.5396	0.0000	7,311.3528

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.4913	42.4721	39.8931	0.0747	7.2470	2.1989	9.4460	3.9263	2.0230	5.9494	0.0000	7,272.8629	7,272.8629	1.5396	0.0000	7,311.3527
Maximum	4.4913	42.4721	39.8931	0.0747	7.2470	2.1989	9.4460	3.9263	2.0230	5.9494	0.0000	7,272.8629	7,272.8629	1.5396	0.0000	7,311.3527

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	60.33	0.00	53.85	60.67	0.00	50.45	0.00	0.00	0.00	0.00	0.00	0.00

## 2.2 Overall Operational

### Unmitigated Operational



	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Energy	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Mobile	7.0880	33.1272	77.7175	0.2527	19.0503	0.2486	19.2989	5.0975	0.2333	5.3308		25,698.5414	25,698.5414	1.3595		25,732.5282
<b>Total</b>	<b>7.5929</b>	<b>33.1334</b>	<b>77.7232</b>	<b>0.2528</b>	<b>19.0503</b>	<b>0.2490</b>	<b>19.2994</b>	<b>5.0975</b>	<b>0.2337</b>	<b>5.3312</b>		<b>25,705.9525</b>	<b>25,705.9525</b>	<b>1.3596</b>	<b>1.4000e-004</b>	<b>25,739.9834</b>

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Energy	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Mobile	7.0880	33.1272	77.7175	0.2527	19.0503	0.2486	19.2989	5.0975	0.2333	5.3308		25,698.5414	25,698.5414	1.3595		25,732.5282
<b>Total</b>	<b>7.5929</b>	<b>33.1334</b>	<b>77.7232</b>	<b>0.2528</b>	<b>19.0503</b>	<b>0.2490</b>	<b>19.2994</b>	<b>5.0975</b>	<b>0.2337</b>	<b>5.3312</b>		<b>25,705.9525</b>	<b>25,705.9525</b>	<b>1.3596</b>	<b>1.4000e-004</b>	<b>25,739.9834</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
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1	Site Preparation	Site Preparation	1/9/2020	1/15/2020	5	5
2	Trenching	Trenching	1/16/2020	2/12/2020	5	20
3	Building Construction	Building Construction	1/16/2020	4/30/2020	5	76
4	Paving	Paving	2/1/2020	2/14/2020	5	10
5	Architectural Coating	Architectural Coating	4/24/2020	4/30/2020	5	5

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,165; Non-Residential Outdoor: 550; Striped Parking Area: 0**

#### **OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

#### **Trips and VMT**

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	80.00	32.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

### 3.2 Site Preparation - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
<b>Total</b>	<b>4.0765</b>	<b>42.4173</b>	<b>21.5136</b>	<b>0.0380</b>	<b>18.0663</b>	<b>2.1974</b>	<b>20.2637</b>	<b>9.9307</b>	<b>2.0216</b>	<b>11.9523</b>		<b>3,685.1016</b>	<b>3,685.1016</b>	<b>1.1918</b>		<b>3,714.8975</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
Total	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	4.0765	42.4173	21.5136	0.0380	7.0458	2.1974	9.2433	3.8730	2.0216	5.8946	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432

Total	0.0814	0.0547	0.7359	2.0700e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		205.9951	205.9951	5.9200e-003		206.1432
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### 3.3 Trenching - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300		800.8869	800.8869	0.2590		807.3625
Total	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300		800.8869	800.8869	0.2590		807.3625

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
Total	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300	0.0000	800.8869	800.8869	0.2590		807.3625
<b>Total</b>	<b>0.4545</b>	<b>4.5178</b>	<b>5.5475</b>	<b>8.2700e-003</b>		<b>0.2500</b>	<b>0.2500</b>		<b>0.2300</b>	<b>0.2300</b>	<b>0.0000</b>	<b>800.8869</b>	<b>800.8869</b>	<b>0.2590</b>		<b>807.3625</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0362	0.0243	0.3271	9.2000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		91.5534	91.5534	2.6300e-003		91.6192
<b>Total</b>	<b>0.0362</b>	<b>0.0243</b>	<b>0.3271</b>	<b>9.2000e-004</b>	<b>0.0894</b>	<b>6.8000e-004</b>	<b>0.0901</b>	<b>0.0237</b>	<b>6.2000e-004</b>	<b>0.0243</b>		<b>91.5534</b>	<b>91.5534</b>	<b>2.6300e-003</b>		<b>91.6192</b>

### 3.4 Building Construction - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
<b>Total</b>	<b>2.1198</b>	<b>19.1860</b>	<b>16.8485</b>	<b>0.0269</b>		<b>1.1171</b>	<b>1.1171</b>		<b>1.0503</b>	<b>1.0503</b>		<b>2,553.0631</b>	<b>2,553.0631</b>	<b>0.6229</b>		<b>2,568.6345</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1051	3.3579	0.7996	8.2300e-003	0.2048	0.0166	0.2214	0.0590	0.0159	0.0749		878.2351	878.2351	0.0551		879.6136
Worker	0.3620	0.2433	3.2705	9.1900e-003	0.8942	6.7800e-003	0.9010	0.2372	6.2500e-003	0.2434		915.5340	915.5340	0.0263		916.1920
<b>Total</b>	<b>0.4670</b>	<b>3.6012</b>	<b>4.0701</b>	<b>0.0174</b>	<b>1.0990</b>	<b>0.0234</b>	<b>1.1224</b>	<b>0.2961</b>	<b>0.0222</b>	<b>0.3183</b>		<b>1,793.7690</b>	<b>1,793.7690</b>	<b>0.0815</b>		<b>1,795.8056</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
<b>Total</b>	<b>2.1198</b>	<b>19.1860</b>	<b>16.8485</b>	<b>0.0269</b>		<b>1.1171</b>	<b>1.1171</b>		<b>1.0503</b>	<b>1.0503</b>	<b>0.0000</b>	<b>2,553.0631</b>	<b>2,553.0631</b>	<b>0.6229</b>		<b>2,568.6345</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1051	3.3579	0.7996	8.2300e-003	0.2048	0.0166	0.2214	0.0590	0.0159	0.0749		878.2351	878.2351	0.0551		879.6136
Worker	0.3620	0.2433	3.2705	9.1900e-003	0.8942	6.7800e-003	0.9010	0.2372	6.2500e-003	0.2434		915.5340	915.5340	0.0263		916.1920
Total	0.4670	3.6012	4.0701	0.0174	1.0990	0.0234	1.1224	0.2961	0.0222	0.3183		1,793.7690	1,793.7690	0.0815		1,795.8056

### 3.5 Paving - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005		1,804.7070	1,804.7070	0.5670		1,818.8830
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005		1,804.7070	1,804.7070	0.5670		1,818.8830

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
Total	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005	0.0000	1,804.7070	1,804.7070	0.5670		1,818.8830
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005	0.0000	1,804.7070	1,804.7070	0.5670		1,818.8830

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480

Total	0.0905	0.0608	0.8176	2.3000e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		228.8835	228.8835	6.5800e-003		229.0480
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### 3.6 Architectural Coating - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.5898					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	1.8320	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0724	0.0487	0.6541	1.8400e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		183.1068	183.1068	5.2600e-003		183.2384
Total	0.0724	0.0487	0.6541	1.8400e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		183.1068	183.1068	5.2600e-003		183.2384

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.5898					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
<b>Total</b>	<b>1.8320</b>	<b>1.6838</b>	<b>1.8314</b>	<b>2.9700e-003</b>		<b>0.1109</b>	<b>0.1109</b>		<b>0.1109</b>	<b>0.1109</b>	<b>0.0000</b>	<b>281.4481</b>	<b>281.4481</b>	<b>0.0218</b>		<b>281.9928</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0724	0.0487	0.6541	1.8400e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		183.1068	183.1068	5.2600e-003		183.2384
<b>Total</b>	<b>0.0724</b>	<b>0.0487</b>	<b>0.6541</b>	<b>1.8400e-003</b>	<b>0.1788</b>	<b>1.3600e-003</b>	<b>0.1802</b>	<b>0.0474</b>	<b>1.2500e-003</b>	<b>0.0487</b>		<b>183.1068</b>	<b>183.1068</b>	<b>5.2600e-003</b>		<b>183.2384</b>

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.0880	33.1272	77.7175	0.2527	19.0503	0.2486	19.2989	5.0975	0.2333	5.3308		25,698.5414	25,698.5414	1.3595		25,732.5282
Unmitigated	7.0880	33.1272	77.7175	0.2527	19.0503	0.2486	19.2989	5.0975	0.2333	5.3308		25,698.5414	25,698.5414	1.3595		25,732.5282

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Arena	632.20	4,150.72	0.00	2,254,623	2,254,623
Total	632.20	4,150.72	0.00	2,254,623	2,254,623

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Arena	16.60	8.40	6.90	0.00	81.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Arena	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
NaturalGas Unmitigated	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Arena	62.9863	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Total		6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Land Use	kBTU/yr	lb/day										lb/day					
Arena	0.0629863	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Total		6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Unmitigated	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4824					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Consumer Products	0.0218					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-005	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Total	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4824					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0218					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-005	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Total	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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**11.0 Vegetation**

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Sherbeck Field - South Coast AQMD Air District, Winter

**Sherbeck Field**  
**South Coast AQMD Air District, Winter**

**1.0 Project Characteristics****1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Arena	4.36	Acre	4.36	1,100.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	31
<b>Climate Zone</b>	8			<b>Operational Year</b>	2020
<b>Utility Company</b>	Southern California Edison				
<b>CO2 Intensity (lb/MW hr)</b>	604.92	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Operational Year 2020. CO2 intensity factor was adjusted to account for SCE's compliance with the RPS.

Land Use - Project acreage: 4.36. The project would include development of a press box and storage building, totaling 1,100 square feet. No other buildings are proposed.

Construction Phase - Construction Phasing was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Off-road Equipment - Construction equipment data was based on information provided by the project applicant.

Trips and VMT - Number of trips for worker and vendor trucks was based on information provided by the project applicant.

Demolition - None required.

Architectural Coating - Default values.

Vehicle Trips - Trip generation rates from the project's traffic impact study were used in place of CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	1,650.00	1,165.00
tblAreaCoating	Area_Nonresidential_Exterior	550	94961
tblAreaCoating	Area_Nonresidential_Interior	1650	284883
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	18.00	5.00
tblConstructionPhase	NumDays	230.00	76.00
tblConstructionPhase	NumDays	18.00	10.00
tblEnergyUse	LightingElect	2.99	3.62
tblEnergyUse	NT24E	3.83	3.85
tblLandUse	LandUseSquareFeet	189,921.60	1,100.00
tblProjectCharacteristics	CO2IntensityFactor	702.44	604.92
tblTripsAndVMT	VendorTripNumber	0.00	32.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	80.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblVehicleTrips	ST_TR	0.00	952.00
tblVehicleTrips	WD_TR	33.33	145.00

## 2.0 Emissions Summary

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### 2.1 Overall Construction (Maximum Daily Emission)

#### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5356	42.4773	39.5451	0.0737	18.2675	2.1989	20.4664	9.9840	2.0230	12.0071	0.0000	7,167.4921	7,167.4921	1.5413	0.0000	7,206.0244
Maximum	4.5356	42.4773	39.5451	0.0737	18.2675	2.1989	20.4664	9.9840	2.0230	12.0071	0.0000	7,167.4921	7,167.4921	1.5413	0.0000	7,206.0244

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5356	42.4773	39.5451	0.0737	7.2470	2.1989	9.4460	3.9263	2.0230	5.9494	0.0000	7,167.4921	7,167.4921	1.5413	0.0000	7,206.0244
Maximum	4.5356	42.4773	39.5451	0.0737	7.2470	2.1989	9.4460	3.9263	2.0230	5.9494	0.0000	7,167.4921	7,167.4921	1.5413	0.0000	7,206.0244

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	60.33	0.00	53.85	60.67	0.00	50.45	0.00	0.00	0.00	0.00	0.00	0.00

## 2.2 Overall Operational

### Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Energy	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Mobile	6.7343	33.5960	74.3931	0.2388	19.0503	0.2506	19.3009	5.0975	0.2352	5.3327		24,294.4157	24,294.4157	1.3723		24,328.7220
Total	7.2391	33.6022	74.3987	0.2388	19.0503	0.2511	19.3014	5.0975	0.2357	5.3332		24,301.8268	24,301.8268	1.3724	1.4000e-004	24,336.1772

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Energy	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Mobile	6.7343	33.5960	74.3931	0.2388	19.0503	0.2506	19.3009	5.0975	0.2352	5.3327		24,294.4157	24,294.4157	1.3723		24,328.7220
Total	7.2391	33.6022	74.3987	0.2388	19.0503	0.2511	19.3014	5.0975	0.2357	5.3332		24,301.8268	24,301.8268	1.3724	1.4000e-004	24,336.1772

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description

1	Site Preparation	Site Preparation	1/9/2020	1/15/2020	5	5
2	Trenching	Trenching	1/16/2020	2/12/2020	5	20
3	Building Construction	Building Construction	1/16/2020	4/30/2020	5	76
4	Paving	Paving	2/1/2020	2/14/2020	5	10
5	Architectural Coating	Architectural Coating	4/24/2020	4/30/2020	5	5

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,165; Non-Residential Outdoor: 550; Striped Parking Area: 0**

#### **OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

#### **Trips and VMT**

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	80.00	32.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

### 3.2 Site Preparation - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
<b>Total</b>	<b>4.0765</b>	<b>42.4173</b>	<b>21.5136</b>	<b>0.0380</b>	<b>18.0663</b>	<b>2.1974</b>	<b>20.2637</b>	<b>9.9307</b>	<b>2.0216</b>	<b>11.9523</b>		<b>3,685.1016</b>	<b>3,685.1016</b>	<b>1.1918</b>		<b>3,714.8975</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
Total	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	4.0765	42.4173	21.5136	0.0380	7.0458	2.1974	9.2433	3.8730	2.0216	5.8946	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038

Total	0.0888	0.0599	0.6626	1.9300e-003	0.2012	1.5300e-003	0.2027	0.0534	1.4100e-003	0.0548		192.6657	192.6657	5.5300e-003		192.8038
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### 3.3 Trenching - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300		800.8869	800.8869	0.2590		807.3625
Total	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300		800.8869	800.8869	0.2590		807.3625

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
Total	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906

#### Mitigated Construction On-Site



	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4545	4.5178	5.5475	8.2700e-003		0.2500	0.2500		0.2300	0.2300	0.0000	800.8869	800.8869	0.2590		807.3625
<b>Total</b>	<b>0.4545</b>	<b>4.5178</b>	<b>5.5475</b>	<b>8.2700e-003</b>		<b>0.2500</b>	<b>0.2500</b>		<b>0.2300</b>	<b>0.2300</b>	<b>0.0000</b>	<b>800.8869</b>	<b>800.8869</b>	<b>0.2590</b>		<b>807.3625</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0395	0.0266	0.2945	8.6000e-004	0.0894	6.8000e-004	0.0901	0.0237	6.2000e-004	0.0243		85.6292	85.6292	2.4600e-003		85.6906
<b>Total</b>	<b>0.0395</b>	<b>0.0266</b>	<b>0.2945</b>	<b>8.6000e-004</b>	<b>0.0894</b>	<b>6.8000e-004</b>	<b>0.0901</b>	<b>0.0237</b>	<b>6.2000e-004</b>	<b>0.0243</b>		<b>85.6292</b>	<b>85.6292</b>	<b>2.4600e-003</b>		<b>85.6906</b>

### 3.4 Building Construction - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
<b>Total</b>	<b>2.1198</b>	<b>19.1860</b>	<b>16.8485</b>	<b>0.0269</b>		<b>1.1171</b>	<b>1.1171</b>		<b>1.0503</b>	<b>1.0503</b>		<b>2,553.0631</b>	<b>2,553.0631</b>	<b>0.6229</b>		<b>2,568.6345</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1101	3.3545	0.8915	8.0000e-003	0.2048	0.0169	0.2217	0.0590	0.0162	0.0751		852.8410	852.8410	0.0592		854.3215
Worker	0.3948	0.2664	2.9447	8.5900e-003	0.8942	6.7800e-003	0.9010	0.2372	6.2500e-003	0.2434		856.2920	856.2920	0.0246		856.9059
<b>Total</b>	<b>0.5049</b>	<b>3.6209</b>	<b>3.8362</b>	<b>0.0166</b>	<b>1.0990</b>	<b>0.0237</b>	<b>1.1227</b>	<b>0.2961</b>	<b>0.0224</b>	<b>0.3185</b>		<b>1,709.1329</b>	<b>1,709.1329</b>	<b>0.0838</b>		<b>1,711.2274</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
<b>Total</b>	<b>2.1198</b>	<b>19.1860</b>	<b>16.8485</b>	<b>0.0269</b>		<b>1.1171</b>	<b>1.1171</b>		<b>1.0503</b>	<b>1.0503</b>	<b>0.0000</b>	<b>2,553.0631</b>	<b>2,553.0631</b>	<b>0.6229</b>		<b>2,568.6345</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1101	3.3545	0.8915	8.0000e-003	0.2048	0.0169	0.2217	0.0590	0.0162	0.0751		852.8410	852.8410	0.0592		854.3215
Worker	0.3948	0.2664	2.9447	8.5900e-003	0.8942	6.7800e-003	0.9010	0.2372	6.2500e-003	0.2434		856.2920	856.2920	0.0246		856.9059
Total	0.5049	3.6209	3.8362	0.0166	1.0990	0.0237	1.1227	0.2961	0.0224	0.3185		1,709.1329	1,709.1329	0.0838		1,711.2274

### 3.5 Paving - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005		1,804.7070	1,804.7070	0.5670		1,818.8830
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005		1,804.7070	1,804.7070	0.5670		1,818.8830

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
Total	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005	0.0000	1,804.7070	1,804.7070	0.5670		1,818.8830
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.1837	11.8015	12.2823	0.0189		0.6509	0.6509		0.6005	0.6005	0.0000	1,804.7070	1,804.7070	0.5670		1,818.8830

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265

Total	0.0987	0.0666	0.7362	2.1500e-003	0.2236	1.7000e-003	0.2253	0.0593	1.5600e-003	0.0609		214.0730	214.0730	6.1400e-003		214.2265
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### 3.6 Architectural Coating - 2020

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.5898					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	1.8320	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0790	0.0533	0.5889	1.7200e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		171.2584	171.2584	4.9100e-003		171.3812
Total	0.0790	0.0533	0.5889	1.7200e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		171.2584	171.2584	4.9100e-003		171.3812

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	1.5898					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
<b>Total</b>	<b>1.8320</b>	<b>1.6838</b>	<b>1.8314</b>	<b>2.9700e-003</b>		<b>0.1109</b>	<b>0.1109</b>		<b>0.1109</b>	<b>0.1109</b>	<b>0.0000</b>	<b>281.4481</b>	<b>281.4481</b>	<b>0.0218</b>		<b>281.9928</b>

### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0790	0.0533	0.5889	1.7200e-003	0.1788	1.3600e-003	0.1802	0.0474	1.2500e-003	0.0487		171.2584	171.2584	4.9100e-003		171.3812
<b>Total</b>	<b>0.0790</b>	<b>0.0533</b>	<b>0.5889</b>	<b>1.7200e-003</b>	<b>0.1788</b>	<b>1.3600e-003</b>	<b>0.1802</b>	<b>0.0474</b>	<b>1.2500e-003</b>	<b>0.0487</b>		<b>171.2584</b>	<b>171.2584</b>	<b>4.9100e-003</b>		<b>171.3812</b>

## 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.7343	33.5960	74.3931	0.2388	19.0503	0.2506	19.3009	5.0975	0.2352	5.3327		24,294.4157	24,294.4157	1.3723		24,328.7220
Unmitigated	6.7343	33.5960	74.3931	0.2388	19.0503	0.2506	19.3009	5.0975	0.2352	5.3327		24,294.4157	24,294.4157	1.3723		24,328.7220

#### 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Arena	632.20	4,150.72	0.00	2,254,623	2,254,623
Total	632.20	4,150.72	0.00	2,254,623	2,254,623

#### 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Arena	16.60	8.40	6.90	0.00	81.00	19.00	66	28	6

#### 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Arena	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

### 5.0 Energy Detail

Historical Energy Use: N

#### 5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
NaturalGas Unmitigated	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Arena	62.9863	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Total		6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Land Use	kBTU/yr	lb/day										lb/day					
Arena	0.0629863	6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542
Total		6.8000e-004	6.1800e-003	5.1900e-003	4.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004		7.4102	7.4102	1.4000e-004	1.4000e-004	7.4542

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Unmitigated	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4824					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Consumer Products	0.0218					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-005	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Total	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4824					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0218					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-005	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003
Total	0.5042	0.0000	4.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		9.5000e-004	9.5000e-004	0.0000		1.0200e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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**User Defined Equipment**

Equipment Type	Number
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**11.0 Vegetation**

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# **APPENDIX E**

## *Noise Modeling*



APPENDIX **E**-1  
*Construction Noise Modeling*  
*Input and Output*



# Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Architectural Coating

		---- Receptor #1 ----						
Description	Land Use	Baselines (dBA)						
		Daytime	Evening	Night				
Nearest Receiver 85'	Residential	65	60	55				
Description		Equipment						
		Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated	
				Lmax	Lmax	Distance	Shielding	
				(dBA)	(dBA)	(feet)	(dBA)	
Compressor (air)		No	40		77.7	85	0	
Results								
Equipment		Calculated (dBA)			Noise Limits (dBA)			
		*Lmax	Leq	Day	Evening		Night	
				Lmax	Leq	Lmax	Leq	Lmax
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
Compressor (air)		73.1	69.1	N/A	N/A	N/A	N/A	N/A
	Total	73.1	69.1	N/A	N/A	N/A	N/A	N/A
*Calculated Lmax is the Loudest value.								

		---- Receptor #2 ----						
Description	Land Use	Baselines (dBA)						
		Daytime	Evening	Night				
Typical Receiver 250'	Residential	65	60	55				
Description		Equipment						
		Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated	
				Lmax	Lmax	Distance	Shielding	
				(dBA)	(dBA)	(feet)	(dBA)	
Compressor (air)		No	40		77.7	250	0	
Equipment		Results						
		Calculated (dBA)			Noise Limits (dBA)			
		*Lmax	Leq	Day	Evening		Night	
				Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		66.7	62.8	N/A	N/A	N/A	N/A	N/A
	Total	70	67.7	N/A	N/A	N/A	N/A	N/A
*Calculated Lmax is the Loudest value.								

# Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Building Construction



		---- Receptor #1 ----		
Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Nearest Receiver 85'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	85	0
Man Lift	No	20		74.7	125	0
Man Lift	No	20		74.7	150	0
Man Lift	No	20		74.7	175	0
Generator	No	50		80.6	200	0
Backhoe	No	40		77.6	200	0
Front End Loader	No	40		79.1	225	0
Tractor	No	40	84		225	0
Welder / Torch	No	40		74	225	0

Equipment	Results				Noise Limits (dBA)			
	Calculated (dBA)		Day		Evening		Night	
	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	
Crane	75.9	68	N/A	N/A	N/A	N/A	N/A	
Man Lift	66.7	59.8	N/A	N/A	N/A	N/A	N/A	
Man Lift	65.2	58.2	N/A	N/A	N/A	N/A	N/A	
Man Lift	63.8	56.8	N/A	N/A	N/A	N/A	N/A	
Generator	68.6	65.6	N/A	N/A	N/A	N/A	N/A	
Backhoe	65.5	61.5	N/A	N/A	N/A	N/A	N/A	
Front End Loader	66	62.1	N/A	N/A	N/A	N/A	N/A	
Tractor	70.9	67	N/A	N/A	N/A	N/A	N/A	
Welder / Torch	60.9	57	N/A	N/A	N/A	N/A	N/A	
Total	75.9	73.1	N/A	N/A	N/A	N/A	N/A	

\*Calculated Lmax is the Loudest value.

		---- Receptor #2 ----		
Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Typical Receiver 250'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	250	0
Man Lift	No	20		74.7	250	0

Man Lift	No	20	74.7	250	0
Man Lift	No	20	74.7	250	0
Generator	No	50	80.6	250	0
Backhoe	No	40	77.6	250	0
Front End Loader	No	40	79.1	250	0
Tractor	No	40	84	250	0
Welder / Torch	No	40	74	250	0

Equipment	Results						
	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening		Night
			Lmax		Lmax	Leq	Lmax
Crane	66.6	58.6	N/A	N/A	N/A	N/A	N/A
Man Lift	60.7	53.7	N/A	N/A	N/A	N/A	N/A
Man Lift	60.7	53.7	N/A	N/A	N/A	N/A	N/A
Man Lift	60.7	53.7	N/A	N/A	N/A	N/A	N/A
Generator	66.7	63.6	N/A	N/A	N/A	N/A	N/A
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
Tractor	70	66	N/A	N/A	N/A	N/A	N/A
Welder / Torch	60	56	N/A	N/A	N/A	N/A	N/A
Total	70	70.2	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

#### Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Demolition

---- Receptor #1 ----				
Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Nearest Receiver 85'	Residential	65	60	55

Description	Equipment					
	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator	No	40		80.7	85	0
Excavator	No	40		80.7	125	0
Excavator	No	40		80.7	150	0
Concrete Saw	No	20		89.6	175	0

Equipment	Results						
	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening		Night
			Lmax		Lmax	Leq	Lmax

Excavator		76.1	72.1	N/A	N/A	N/A	N/A	N/A
Excavator		72.8	68.8	N/A	N/A	N/A	N/A	N/A
Excavator		71.2	67.2	N/A	N/A	N/A	N/A	N/A
Concrete Saw		78.7	71.7	N/A	N/A	N/A	N/A	N/A
	Total	78.7	76.4	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

		----- Receptor #2 -----					
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Typical Receiver 250'	Residential	65	60	55			
		Equipment					
			Spec	Actual	Receptor	Estimated	
		Impact	Lmax	Lmax	Distance	Shielding	
Description		Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator		No	40		80.7	250	0
Excavator		No	40		80.7	250	0
Excavator		No	40		80.7	250	0
Concrete Saw		No	20		89.6	250	0

		Results						
		Calculated (dBA)			Noise Limits (dBA)			
				Day	Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		66.7	62.8	N/A	N/A	N/A	N/A	N/A
Excavator		66.7	62.8	N/A	N/A	N/A	N/A	N/A
Excavator		66.7	62.8	N/A	N/A	N/A	N/A	N/A
Concrete Saw		75.6	68.6	N/A	N/A	N/A	N/A	N/A
	Total	75.6	71.1	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

#### Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Paving

		Baselines (dBA)			---- Receptor #1 ----			
Description	Land Use	Daytime	Evening	Night				
Nearest Receiver 85'	Residential	65	60	55				
		Equipment						
		Impact		Spec	Actual	Receptor	Estimated	
		Device	Usage(%)	Lmax	Lmax	Distance	Shielding	
Description				(dBA)	(dBA)	(feet)	(dBA)	
Concrete Mixer Truck		No	40		78.8	85	0	

Concrete Batch Plant	No	15	83		85	0
Paver	No	50		77.2	120	0
All Other Equipment > 5 HP	No	50	85		120	0
All Other Equipment > 5 HP	No	50	85		150	0
Roller	No	20		80	150	0
Roller	No	20		80	175	0
Tractor	No	40	84		175	0

Results							
Equipment	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening		Night
			Lmax		Lmax	Leq	Lmax
Concrete Mixer Truck	74.2	70.2	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	78.4	70.2	N/A	N/A	N/A	N/A	N/A
Paver	69.6	66.6	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	77.4	74.4	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.5	72.4	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A
Roller	69.1	62.1	N/A	N/A	N/A	N/A	N/A
Tractor	73.1	69.1	N/A	N/A	N/A	N/A	N/A
Total	78.4	79.2	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

---- Receptor #2 ----				
Baselines (dBA)				
Description	Land Use	Daytime	Evening	Night
Typical Receiver 250'	Residential	65	60	55

Description	Equipment					
	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	250	0
Concrete Batch Plant	No	15	83		250	0
Paver	No	50		77.2	250	0
All Other Equipment > 5 HP	No	50	85		250	0
All Other Equipment > 5 HP	No	50	85		250	0
Roller	No	20		80	250	0
Roller	No	20		80	250	0
Tractor	No	40	84		250	0

Results							
Equipment	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening		Night
			Lmax		Lmax	Leq	Lmax
Concrete Mixer Truck	64.8	60.8	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	69	60.8	N/A	N/A	N/A	N/A	N/A

Paver	63.2	60.2	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71	68	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71	68	N/A	N/A	N/A	N/A	N/A
Roller	66	59	N/A	N/A	N/A	N/A	N/A
Roller	66	59	N/A	N/A	N/A	N/A	N/A
Tractor	70	66	N/A	N/A	N/A	N/A	N/A
Total	71	73.4	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

#### Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Site Preparation

#### ---- Receptor #1 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Nearest Receiver 85'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	85	0
Dozer	No	40		81.7	125	0
Dozer	No	40		81.7	150	0
Backhoe	No	40		77.6	175	0
Front End Loader	No	40		79.1	200	0
Tractor	No	40	84		200	0
Dozer	No	40		81.7	225	0

#### Results

Equipment	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening		Night
			Lmax		Lmax	Leq	Lmax
Dozer	77.1	73.1	N/A	N/A	N/A	N/A	N/A
Dozer	73.7	69.7	N/A	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A	N/A
Backhoe	66.7	62.7	N/A	N/A	N/A	N/A	N/A
Front End Loader	67.1	63.1	N/A	N/A	N/A	N/A	N/A
Tractor	72	68	N/A	N/A	N/A	N/A	N/A
Dozer	68.6	64.6	N/A	N/A	N/A	N/A	N/A
Total	77.1	76.9	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

#### ---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Typical Receiver 250'	Residential	65	60	55

Description	Impact	Device	Usage(%)	Equipment		
				Spec	Actual	Receptor
				Lmax	Lmax	Distance
				(dBA)	(dBA)	(feet)
Dozer	No		40		81.7	250
Dozer	No		40		81.7	250
Dozer	No		40		81.7	250
Backhoe	No		40		77.6	250
Front End Loader	No		40		79.1	250
Tractor	No		40	84		250
Dozer	No		40		81.7	250
						Estimated
						Shielding
						(dBA)

Equipment	Results						
	Calculated (dBA)			Noise Limits (dBA)			
	*Lmax	Leq	Day	Leq	Evening	Leq	Night
			Lmax		Lmax		Lmax
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
Tractor	70	66	N/A	N/A	N/A	N/A	N/A
Dozer	67.7	63.7	N/A	N/A	N/A	N/A	N/A
Total	70	71.9	N/A	N/A	N/A	N/A	N/A

\*Calculated Lmax is the Loudest value.

#### Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/2/2018  
Case Description: Sherback Field\_Trenching

		---- Receptor #1 ----				
Description	Land Use	Baselines (dBA)				
		Daytime	Evening	Night		
Nearest Receiver 85'	Residential	65	60	55		
Description	Impact	Equipment				
		Device	Usage(%)	Spec	Actual	Receptor
				Lmax	Lmax	Distance
				(dBA)	(dBA)	(feet)
Estimated	Shielding					
Excavator	No	40		80.7	85	0
Tractor	No	40		84	125	0

			Results						
			Calculated (dBA)		Noise Limits (dBA)				
					Day	Evening		Night	
Equipment			*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator			76.1	72.1	N/A	N/A	N/A	N/A	N/A
Tractor			76	72.1	N/A	N/A	N/A	N/A	N/A
	Total		76.1	75.1	N/A	N/A	N/A	N/A	N/A
*Calculated Lmax is the Loudest value.									

\*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Typical Receiver 250'	Residential	65	60	55

Description	Impact	Usage(%)	Equipment			
			Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Excavator	No	40		80.7	250	0
Tractor	No	40	84		250	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day	Evening		
		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Equipment							
Excavator		66.7	62.8	N/A	N/A	N/A	N/A
Tractor		70	66	N/A	N/A	N/A	N/A
	Total	70	67.7	N/A	N/A	N/A	N/A
*Calculated Lmax is the Loudest value.							

APPENDIX **E**-2  
*Stadium Noise Analysis Report*





June 29, 2018

**DLR Group**  
1650 Spruce Street, Suite 300  
Riverside, CA 92507

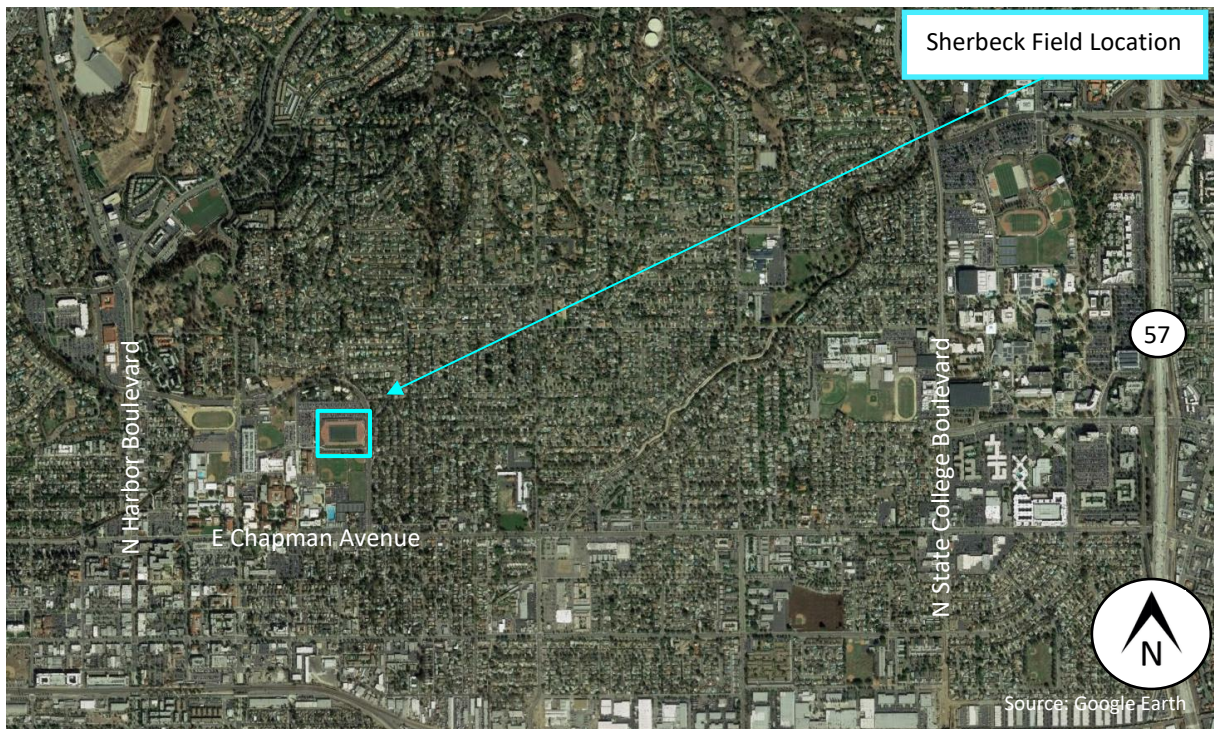
Attention: Leigh Anne Jones | Senior Architect

Subject: **Fullerton College Sherbeck Field; Fullerton, California**  
**Exterior Acoustical Study Report**  
**VA Project No. 2663-071**

Dear Ms. Jones,

Veneklasen Associates (VA) was contracted to conduct an acoustical study for proposed changes to the Sherbeck Field athletic facility at Fullerton College in Fullerton, California. Fullerton College is located at 321 E Chapman Avenue, Fullerton, CA 92832. The location of the project site is shown in Figure 1.

A list of acoustical terms and their definitions is presented in *Appendix A*.



**Figure 1. Project Site Location**

## PROJECT DESCRIPTION

Sherbeck Field at Fullerton College is an existing athletic facility including a turf field and surrounding track for various athletic activities at the college. The purpose of this project is for the addition of additional bleacher sitting on the south (home) and north (visitor) sidelines, the installation of a press box, and the design and installation of a public address (PA) system for the facility.

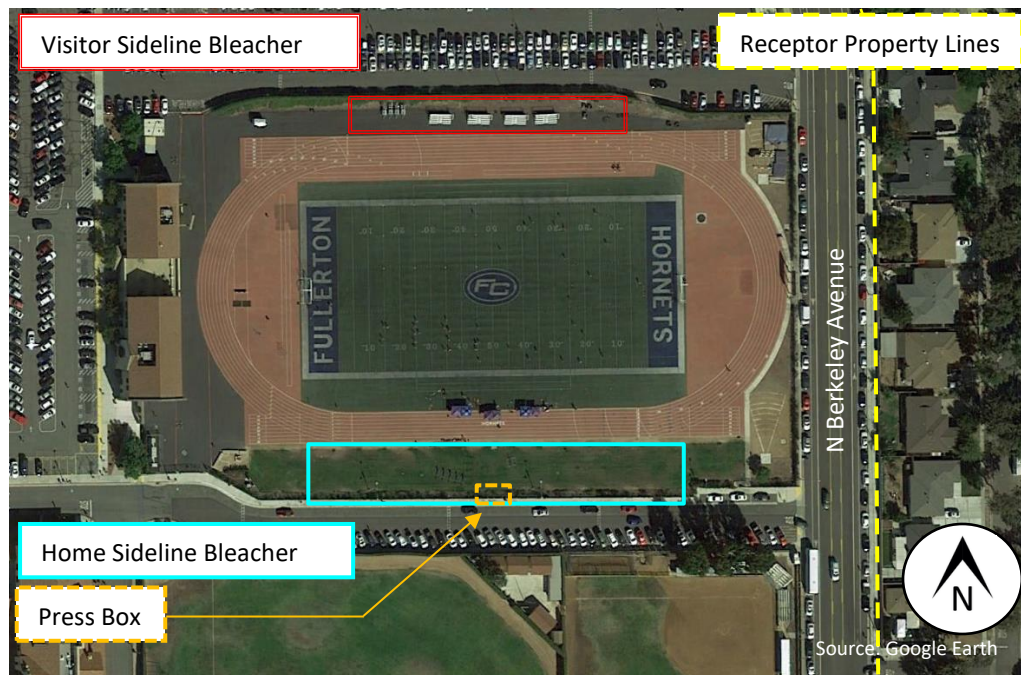
The proposed home sideline bleacher is proposed on the existing grass area to the south of the existing field and track. The proposed bleacher is approximately 43'2" in the north-south direction, and the top row of seats is approximately 19'6" above grade elevation. The press box is located at the center of the bleacher with a base elevation at 19'6" above grade, and a top height of approximately 8'9" above the highest row of seats at the front of the press box. The press box is approximately 9'0" in the north-south direction. The home sideline bleacher is designed for a maximum capacity of 2861 people.

The proposed visitor sideline bleacher is proposed on the existing paved area to the north of the existing field and track. The proposed bleacher is approximately 34'0" in the north-south direction, and the top row of seats is approximately 15'8" above grade elevation. The visitor sideline bleacher is designed for a maximum capacity of 1556 people.

The proposed public address (PA) speaker system was designed by PlanNet, and utilizes speaker arrays designed by L-Acoustics. There are seven speaker arrays (including the press box) specified for the home sideline, and five speaker arrays specified for the visitor sideline. Speakers are proposed at approximately 36 feet above grade elevation on the home sideline (33 feet above grade for the press box speaker array) and 33 feet above grade elevation on the visitor sideline.

Several single-family residences are located along N Berkeley Avenue to the east and north of the project area. These residences have been considered receptors for the purposes of this acoustical study.

The total capacity of the proposed project is 4417 people on both sidelines, in addition to personnel on the field. The locations of various project elements and receptor locations are shown in Figure 2.



**Figure 2. Project Elements and Receptor Locations**

## CRITERIA

The City of Fullerton Municipal Code (FMC) specifies sound level limits in Title 15, *Zoning*. In Chapter 15.90, *Noise Standards and Regulations*, various acoustical terms and specific sound level limits for various zones are defined.

In Section 15.90.030.A, *Noise Standards*, the FMC defines sound level limits for residential noise zones. Sound level limits specified in the FMC are shown in Table 1.

**Table 1. Sound Level Limits for Residential Noise Zones**

Receptor Location	Time Period	Allowable Noise Level (dB(A))
Interior	Day (07:00 – 22:00)	55
	Night (22:00 – 07:00)	45
Exterior	Day (07:00 – 22:00)	55
	Night (22:00 – 07:00)	50

As interior sound levels are variable based on the design of the exterior façade of the residence, glazing assemblies, etc., prediction is not possible without significant additional measurements. Therefore, only exterior sound levels are considered in this acoustical study.

Section 15.90.030.B defines additional sound level standards for sensitive land uses. This section defines “sensitive uses” as “any private or public school, hospital, residential care facility for the elderly, and religious institution”. Although Fullerton College is an educational facility, each of the receptors surrounding this project are single-family residential properties, and therefore are not considered “sensitive uses” according to this chapter of the FMC.

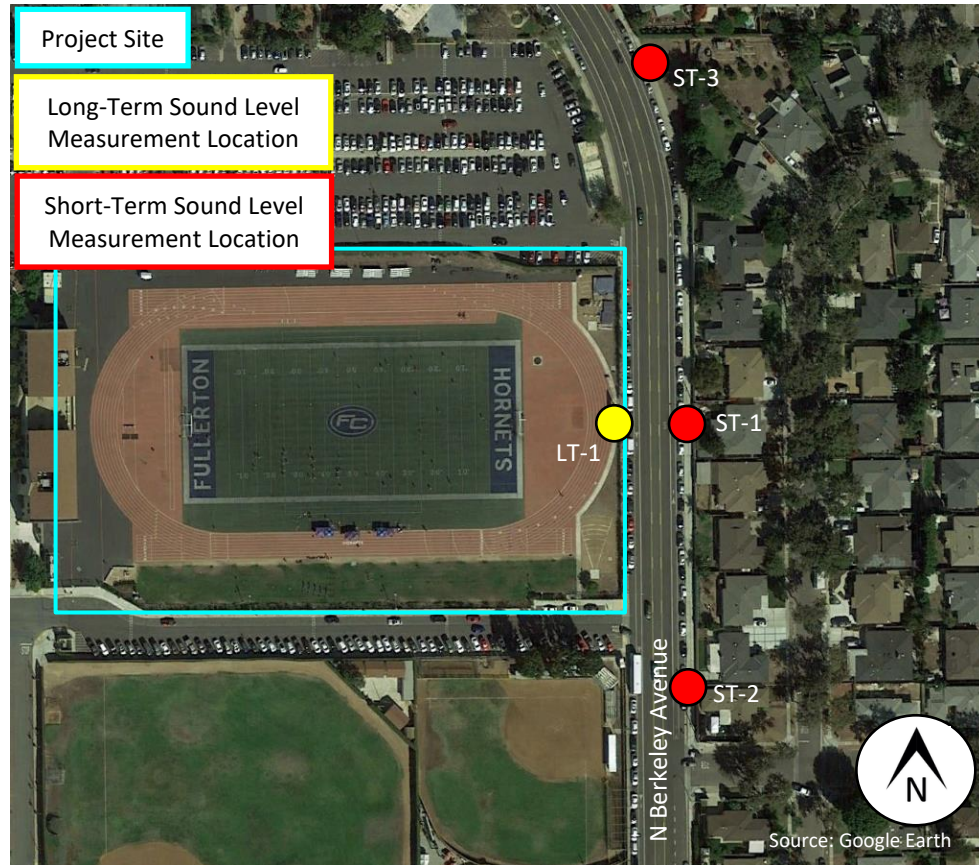
Section 15.90.040, *Activities exempt from standards*, specifies activities that are exempt from sound level standards discussed in this chapter of the FMC. Item A-1 in this section specifies “[s]chool bands, school athletic and school entertainment events” as exempt activities. Item A-2 in this section specifies “[o]utdoor gatherings, public dances, shows and sporting and entertainment events provided the events are conducted pursuant to a permit and/or license issued by the city” as exempt activities. Item A-3 in this section specifies “[a]ctivities conducted on public parks, public playgrounds and public or private school grounds” as exempt activities.

VA interprets the above sections of the FMC such that the proposed Sherbeck Field project shall be exempt from strict interpretation of FMC sound level limits due to the exemption in Section 15.90.040.A.1. However, sound levels from the proposed project have been analyzed to quantify the predicted sound levels at residential receptor locations near the project with respect to the existing “ambient” sound levels at these receptors.



### ACOUSTICAL MEASUREMENTS

Measurements were conducted by VA in and around the project site to quantify existing sound levels at nearby residential receptor property lines. Measurements were conducted on 12/15/2017 through 12/18/2017 at four discrete measurement sites for various durations. Measurement locations are shown in Figure 3 and described in Table 2 below. The primary sound source in the project area is automobile traffic on N Berkeley Avenue.



**Figure 3. Acoustical Measurement Locations**

**Table 2. Acoustical Measurement Locations**

Measurement Site	Approximate Duration	Description
LT-1	3 Days	East property line of existing Sherbeck Field on Fullerton College property on west side of N Berkeley Avenue.
ST-1	1 Hour	Public R.O.W. on east of N Berkeley Avenue west of single-family residential property at 621 Princeton Circle W, Fullerton, CA 92831
ST-2	20 Minutes	Public R.O.W. east of N Berkeley Avenue west of single-family residential property at 601 Princeton Circle W, Fullerton, CA 92831
ST-2	20 Minutes	Public R.O.W. east of N Berkeley Avenue west of empty lot to the south of 600 E Glenwood Avenue, Fullerton, CA 92831

One long-term acoustical measurement (denoted Site LT-1) was conducted on the east side of the existing Sherbeck Field property to quantify long-term sound levels generated by automobile traffic on N Berkeley Avenue. This sound level meter was installed on 12/15/2017 at approximately 10:00 a.m. and measured continuously until 12/18/2017 at approximately 08:00 a.m.

Three additional short-term acoustical measurements (denoted Sites ST-1, ST-2, and ST-3) were conducted while the long-term measurement was simultaneously measuring at public right-of-way (R.O.W.) adjacent to nearby residential receptors. By comparing measured short-term sound levels at these locations to the simultaneously measured sound levels at location LT-1, sound levels could be correlated by calculating an “offset” difference in sound levels. Utilizing that offset and the hourly measured sound levels at Site LT-1 (averaged across the three-day measurement period), sound levels at any period of the day at each of the ST sites can be accurately calculated.

Simultaneously measured sound levels at each of the measurement sites, as well as calculated sound level offset values, are shown in Table 3. Calculated hourly sound levels at each of the measurement locations using this offset are shown in Table 4 on the following page. The complete set of measured sound levels at Site LT-1 are shown in *Appendix B. Site LT-1 Measured Sound Levels*.

**Table 3. Simultaneously Measured Existing Sound Levels and Offset Values**

Measurement Site	Measured Sound Level, $L_{eq}$ (dB(A) re: 20 $\mu$ Pa)		Offset (dB)
	Site LT-1	ST Sites	
ST-1	68	70	2
ST-2	65	67	2
ST-3	65	69	4

Acoustical measurements for this project were conducted with Brüel & Kjær Type 2270 sound level meters which conform to ANSI S.14-1961 for Type 1 precision sound level meters. Measurements were conducted utilizing Brüel and Kjær Type 4189 microphones. All equipment was field-calibrated before use utilizing a Larson Davis CAL200 acoustical calibrator.

## ACOUSTICAL MODELING PROCEDURES AND RESULTS

An acoustical model of the project area has been generated to evaluate and quantify sound levels generated by the proposed project and their impact on nearby residential receptors. Sound exposure was modeled using the Brüel & Kjær Predictor acoustical modeling software, Version 12.00. The selected calculation method for this project was LimA – International Organization for Standardization (ISO) 9613.1/2.

Acoustical models were generated for projected crowd noise, projected noise levels from the proposed speaker system, and for existing traffic noise in the project area. Acoustical modeling procedures for all scenarios are discussed in this section of the report.

The acoustical model includes shielding and reflections generated by buildings, walls and other structures in the area with elevations obtained utilizing Google Earth. The noise model also includes terrain elevation data from the United States Geological Survey (USGS) NAD83 data set.

This section is continued on page 7 of this report.

**Table 4. Residential Receptor Existing Sound Levels**

Time of Day (hh:mm)	Hourly Existing Sound Level at Corresponding Residential Receptor, $L_{eq}$ (dB(A) re: 20 $\mu$ Pa)		
	ST-1	ST-2	ST-3
00:00	57	57	59
01:00	55	55	58
02:00	55	55	57
03:00	53	53	55
04:00	55	55	57
05:00	59	59	61
06:00	61	61	63
07:00	65	65	67
08:00	64	64	66
09:00	65	65	67
10:00	66	67	69
11:00	66	66	68
12:00	66	66	68
13:00	66	66	68
14:00	68	68	70
15:00	68	68	70
16:00	67	67	69
17:00	66	66	68
18:00	65	65	67
19:00	64	64	66
20:00	63 <sup>a</sup>	63 <sup>a</sup>	65 <sup>a</sup>
21:00	65	65	67
22:00	62	62	64
23:00	60	60	62

<sup>a</sup> Denotes minimum existing sound level between 07:00 a.m. and 22:00 (10:00 p.m.), which are the expected potential operating hours of the proposed project.

## ACOUSTICAL MODELING PROCEDURES AND RESULTS (CONTINUED)

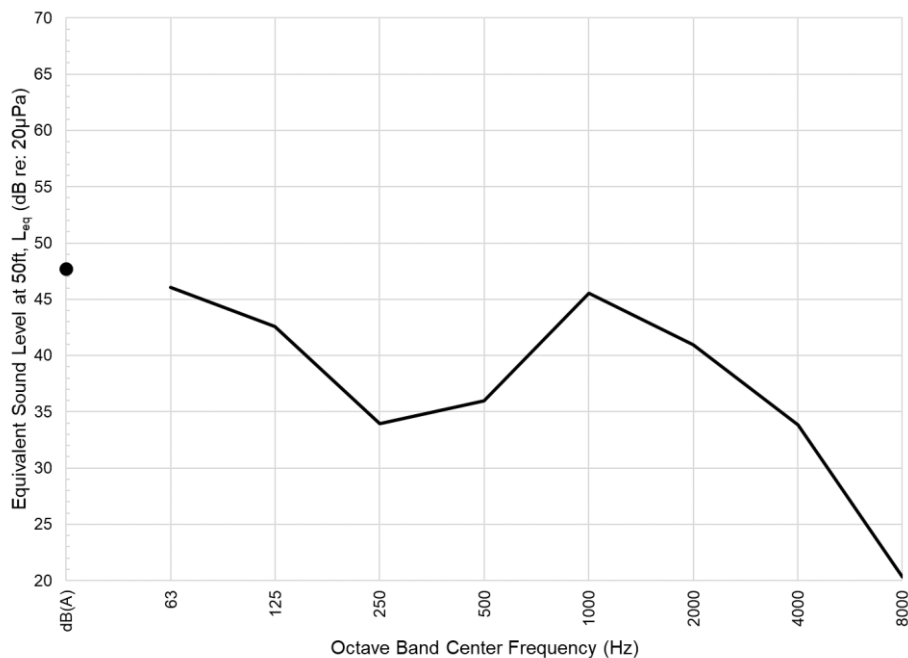
Utilizing the Brüel & Kjær Predictor acoustical modeling software, VA utilized the following data sets and assumptions to model sound levels due to the proposed project.

### Crowd and On-Field Source Modeling:

VA utilized various data sources to determine the average sound levels generated by crowds at sporting events. VA utilized data measured for previous projects for both softball and soccer activities, and normalized all data for both measured distance and crowd size.

VA also utilized measurement data presented in the Harvard-Westlake Middle School (located in Los Angeles, California) Campus Modernization Project Draft Noise Assessment Technical Report, prepared by PCR Services Corporation in January 2004. This report presents data measured both near the source at nearby residential receptors during a football games. This data was used to corroborate previously measured data by VA.

The above data sets were normalized to obtain the sound power (source sound level) characteristics of a crowd of a given size. The reference sound pressure level spectrum per person utilized for this report, normalized to a 50-foot setback distance, is shown in Figure 4.



**Figure 4. Crowd Reference Sound Pressure Level per Person, Normalized to 50 feet Setback Distance**

The noise model was generated using a crowd of 2725 people on the home sideline bleacher and 1475 people on the visitor sideline bleacher (95% maximum capacity on both sidelines). The crowd was assumed to be dispersed evenly about both bleachers. Crowd sources were modeled as omnidirectional point sources.

The acoustical model additionally includes 300 total people (150 home and 150 visitor) at grade elevation on the field sidelines, to evaluate noise exposure from players, coaches, and referees. These results are included in the acoustical crowd noise model.

A sound level contour map for crowd and on-field sources is shown in Figure 8 on page 11.



### Speaker System Source Modeling:

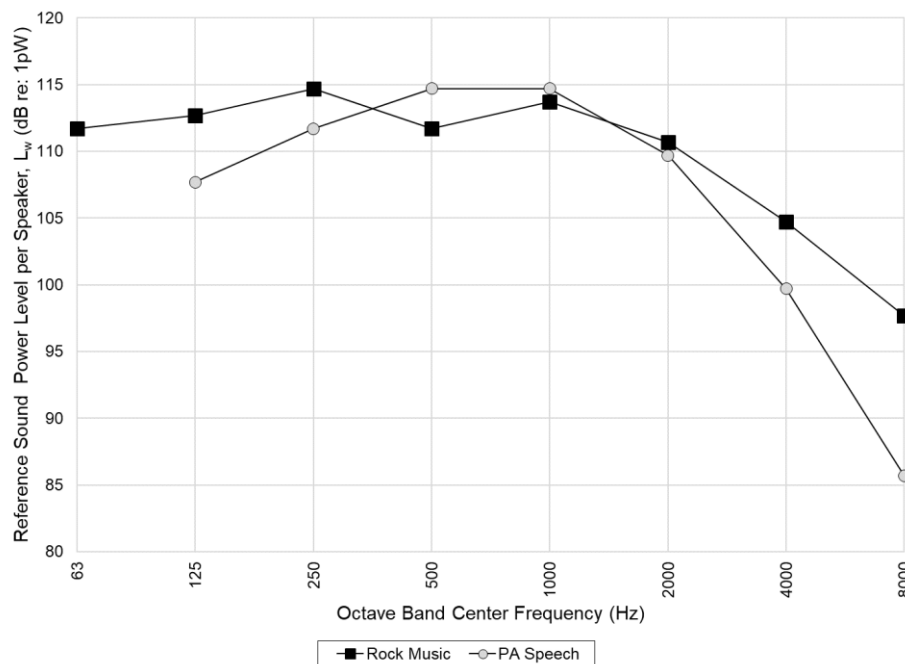
The speaker / public address (PA) system for the Sherbeck Field project was designed by PlanNet, and utilized speaker arrays designed by L-Acoustics, Inc. Speaker design models and other associated information were provided to VA in a Soundvision audio/visual model. VA incorporated speaker locations and orientations into the Predictor acoustical model for evaluation of sound level exposure.

Two types of L-Acoustics speaker arrays were specified for this project. Seven speaker arrays were specified on the home sideline to the south (including the press box), at a height of approximately 36 feet above grade elevation (33 feet above grade for the press box speaker array). The speaker array specified is a combination of the Arcs Focus speaker on top, with the Arcs Wide speaker on the bottom.

Five speaker arrays were specified on the visitor sideline to the north, at a height of approximately 33 feet above grade elevation. The speaker array specified is a dual configuration of Arcs Focus speakers.

The directivities of both speaker arrays were determined using the EASE audio/visual model, utilizing inputs on each speaker type provided by L-Acoustics. The directivities of each associated speaker array utilized in VA's acoustical model is shown as *Appendix C. L-Acoustics, Inc. Speaker Array Directivity Diagrams*. The directivities shown are conservatively utilized for both the horizontal and vertical directions, utilizing the speaker orientations specified in the Soundvision audio/visual model.

VA utilized reference sound levels from various sources to evaluate sound level exposure. A sound level spectrum for rock music was utilized from *Architectural Acoustics* by M. David Egan. A sound level spectrum for human speech through the PA system was utilized from the textbook *Acoustics* by Leo L. Beranek. Both spectra were normalized to a sound level ( $L_p$ ) of 91 dB(A) in the bleacher, which is 10 dB above the level generated by the crowd at an identical location. The reference sound power levels of each source spectrum for each speaker are shown in Figure 5.



**Figure 5. Speaker System Reference Sound Power Levels; Each Array**

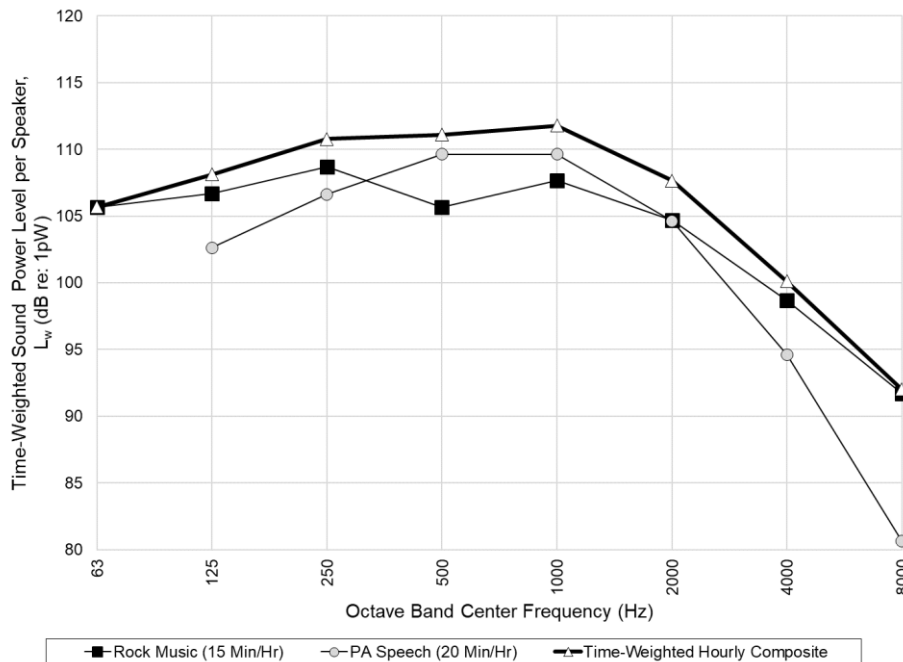
Utilizing the reference sound levels for both music and speech over the PA system, a composite time-weighted sound power level for the PA system was determined.

It was assumed for this assessment that rock music was utilized at the reference sound power level shown in Figure 5 for 15 minutes out of every hour (25% utilization). This assumption was based on VA's qualitative observations of sporting events.

It was assumed for this assessment that PA speech was utilized at the reference sound power level shown in Figure 5 for 20 minutes out of every hour (33% utilization). This assumption was based on VA's qualitative observations of sporting events.

Utilizing the above assumptions, the reference sound power level spectra for both PA music and speech were weighted with respect to time, to determine the maximum average hourly contribution of each noise source. The two time-weighted spectra were combined to determine the composite time-weighted maximum average hourly noise level contribution of each array of the PA system.

The time-weighted spectrum for PA music and speech, as well as the total composite time-weighted average sound power level of each speaker array, are shown in Figure 6.



**Figure 6. Speaker System Time-Weighted Sound Power Levels, Each Array**

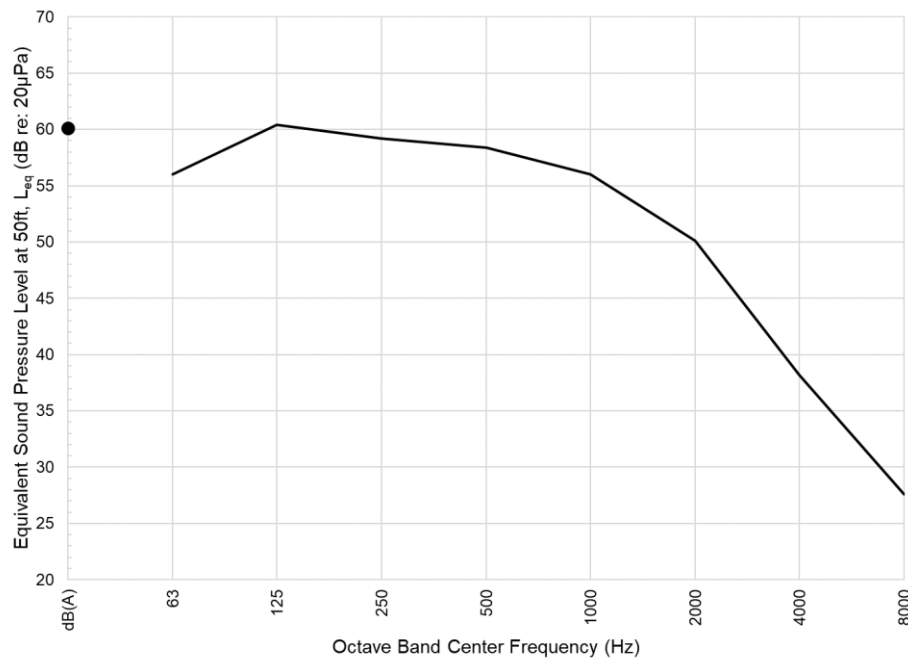
Spectral sound level contour maps for the proposed PA speaker system utilizing the above assumptions are shown in *Appendix D. I-acoustics, inc. Speaker (PA) System Sound Level Contour Figures*. The Predictor acoustical model is limited in that it cannot incorporate spectral directivities for a source, therefore each octave band was modeled separately. Note that all spectral sound levels are modeled as A-weighted sound levels, for visual comparison to overall A-weighted sound levels presented quantitatively.

### **Existing Sound Level Traffic Modeling:**

Utilizing the measured sound levels described in the *Acoustical Measurements* section of this report, an acoustical model was generated to evaluate the existing sound level at each residential receptor in the project area.

To evaluate existing traffic noise at each receptor, the measured sound level spectrum measured at Site ST-1 (nearest to N Berkeley Avenue, along the residential property line) was normalized to the quietest measured hour at site LT-1. Utilizing this procedure, the existing quietest hour due to traffic noise can be evaluated.

The modeled sound pressure level of N Berkeley Avenue, normalized to a 50-foot setback distance, is shown in Figure 7.



**Figure 7. Modeled Existing Traffic Sound Levels**

### **Cumulative Sound Levels:**

Each of these acoustical models was combined to generate the cumulative predicted maximum hourly sound levels generated by the proposed project. Existing quietest hourly sound levels, predicted sound levels due to the crowd, predicted sound levels due to the proposed speaker system, cumulative sound levels, and maximum future sound level increase are shown in Table 5 on page 12.

Quantitative sound level results are at the property line location closest to the project site at a height of five feet above grade elevation. For the majority of residential receptors in the study area, there is a four-foot high property line wall between the residential property and the public right-of-way. Each receptor location is therefore approximately one-foot above the top of this property line wall.



Figure 8. Modeled Maximum Hourly Sound Level Results, Crowd and On-Field Sources Only



**Table 5. Property Line Maximum Hourly Sound Exposure Level Results**

Receptor	Existing Sound Level, Leq (dB(A)) <sup>a</sup>	Predicted Sound Levels, Leq (dB(A))			Cumulative Future Sound Level, Leq (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	62	67	69	69	7
600 E Glenwood Avenue	62	63	67	68	69	7
637 Princeton Circle W	62	65	71	72	72	10
633 Princeton Circle W	63	66	74	74	75	12
629 Princeton Circle W	63	66	73	74	74	11
625 Princeton Circle W	63	67	74	75	75	12
621 Princeton Circle W	63	67	75	75	76	13
617 Princeton Circle W	63	68	75	76	76	13
613 Princeton Circle W	63	68	74	75	75	12
609 Princeton Circle W	63	68	74	75	75	12
605 Princeton Circle W	63	66	71	73	73	10
601 Princeton Circle W	63	67	71	72	73	10
545 Princeton Circle W	63	64	67	69	70	7

<sup>a</sup> Existing sound level on receptor property was calculated using an acoustical model for N Berkeley Avenue, calibrated to minimum hourly sound level, as measured on-site.

Note – Sound levels are rounded to the nearest whole decibel.

## **MITIGATION RECOMMENDATIONS**

Due to the height of speakers and grandstands proposed for this project, traditional sound level mitigation measures are predicted to be ineffective or infeasible for the reduction of sound levels due to the proposed project. Property line noise barrier walls would need to be constructed to a very high elevation to provide acoustic shielding to residential receptors, as speaker arrays and the top row of the crowd are located at elevations of 30 feet above grade. Noise barrier walls on the bleachers would likely add significant structural weight for little acoustic benefit, and are therefore also not considered feasible.

Two initial public-address system strategies were considered, the design analyzed above was the most optimum design to reduce impact to areas outside of Sherbeck Field. Other, more traditional approaches, resulted in unacceptable levels of sound transmission to Fullerton College neighbors.

VA investigated the design of a focused public-address system to minimize system levels reaching the neighbors while analyzing various grandstand seating capacities for determining possible benefits. This focused public-address system incorporated up to eight JBL AW266-LS loudspeakers per grandstand and the total stadium seating capacity ranging from 2,000 to 3,500. Eight different grandstand seating combinations were analyzed in acoustical models to generate the cumulative predicted maximum hourly sound levels generated. Existing quietest hourly sound levels, predicted sound levels due to the crowd, predicted sound levels due to the proposed speaker system, cumulative sound levels, and maximum future sound level increase are shown in Tables 6 through 13 below.

A review of the tables indicates an average reduction in noise level impact from the initial proposed project ranging from 2 to 4 decibels. A reduction in the crowd size decreases the noise generated by the crowd, which in turn decreases the required sound level of the public-address system. This analysis assumes a public-address system sound level of 10 decibels above the crowd noise level. Further reductions in the overall sound level increase can be achieved by reducing the sound level of the public-address system. A reduction in the public-address system of 2 or 4 decibels will further reduce the overall sound level increase by 1 or 2 decibels, respectively, yielding an overall reduction between 3 and 6 decibels.

VA also reviewed the option of placing speakers in front of the grandstands. This option was infeasible as proper placement of these loudspeakers would require installation in the center of the proposed track. The analysis also indicated there were no significant sound level reductions afforded by this option.

**Table 6. Property Line Maximum Hourly Sound Exposure Level for 3000 Home Spectators and 500 Visitor Spectators**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	60	66	67	68	6
600 E Glenwood Avenue	62	60	66	67	68	6
637 Princeton Circle W	62	60	69	70	70	8
633 Princeton Circle W	63	62	70	71	71	8
629 Princeton Circle W	63	62	70	71	71	8
625 Princeton Circle W	63	64	71	72	72	9
621 Princeton Circle W	63	65	72	73	73	10
617 Princeton Circle W	63	66	73	74	74	11
613 Princeton Circle W	63	66	72	73	73	10
609 Princeton Circle W	63	66	71	72	73	10
605 Princeton Circle W	63	65	69	71	71	8
601 Princeton Circle W	63	66	69	71	71	8
545 Princeton Circle W	63	65	65	68	69	6

**Table 7. Property Line Maximum Hourly Sound Exposure Level for 2500 Home Spectators and 1000 Visitor Spectators**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	60	66	67	68	6
600 E Glenwood Avenue	62	61	66	67	68	6
637 Princeton Circle W	62	60	68	69	69	7
633 Princeton Circle W	63	63	71	72	72	9
629 Princeton Circle W	63	63	71	72	72	9
625 Princeton Circle W	63	64	72	73	73	10
621 Princeton Circle W	63	65	73	74	74	11
617 Princeton Circle W	63	66	73	74	74	11
613 Princeton Circle W	63	66	72	73	73	10
609 Princeton Circle W	63	65	71	72	72	9
605 Princeton Circle W	63	65	69	70	71	8
601 Princeton Circle W	63	65	69	70	71	8
545 Princeton Circle W	63	64	66	68	69	6



**Table 8. Property Line Maximum Hourly Sound Exposure Level for 2500 Home Spectators and 500 Visitor Spectators**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	60	65	66	68	6
600 E Glenwood Avenue	62	61	65	67	66	4
637 Princeton Circle W	62	60	68	69	70	8
633 Princeton Circle W	63	63	70	71	72	9
629 Princeton Circle W	63	62	70	71	72	9
625 Princeton Circle W	63	64	71	72	73	10
621 Princeton Circle W	63	65	72	73	73	10
617 Princeton Circle W	63	65	72	73	73	10
613 Princeton Circle W	63	65	72	73	73	10
609 Princeton Circle W	63	65	71	72	73	10
605 Princeton Circle W	63	65	69	71	72	9
601 Princeton Circle W	63	65	69	71	72	9
545 Princeton Circle W	63	64	66	68	70	7

**Table 9. Property Line Maximum Hourly Sound Exposure Level for 3000 Home Spectators and No Visitor Seating**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	59	66	67	69	7
600 E Glenwood Avenue	62	59	65	66	66	4
637 Princeton Circle W	62	59	68	69	70	8
633 Princeton Circle W	63	62	69	70	71	8
629 Princeton Circle W	63	61	69	70	71	8
625 Princeton Circle W	63	64	70	71	72	9
621 Princeton Circle W	63	65	72	73	73	10
617 Princeton Circle W	63	66	72	73	74	11
613 Princeton Circle W	63	66	72	73	74	11
609 Princeton Circle W	63	66	70	71	72	9
605 Princeton Circle W	63	65	68	70	71	8
601 Princeton Circle W	63	66	68	70	71	8
545 Princeton Circle W	63	65	64	68	69	6

**Table 10. Property Line Maximum Hourly Sound Exposure Level for 2000 Home Spectators and 500 Visitor Spectators**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	59	64	65	67	5
600 E Glenwood Avenue	62	60	64	66	66	4
637 Princeton Circle W	62	59	67	68	69	7
633 Princeton Circle W	63	62	69	70	71	8
629 Princeton Circle W	63	61	69	70	71	8
625 Princeton Circle W	63	63	70	71	72	9
621 Princeton Circle W	63	64	71	72	72	9
617 Princeton Circle W	63	64	71	72	72	9
613 Princeton Circle W	63	64	71	72	72	9
609 Princeton Circle W	63	64	70	71	72	9
605 Princeton Circle W	63	64	68	70	71	8
601 Princeton Circle W	63	64	68	70	71	8
545 Princeton Circle W	63	63	65	67	69	6

**Table 11. Property Line Maximum Hourly Sound Exposure Level for 2500 Home Spectators and No Visitor Seating**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	58	65	66	68	6
600 E Glenwood Avenue	62	58	64	65	66	4
637 Princeton Circle W	62	58	67	68	69	7
633 Princeton Circle W	63	61	68	69	70	7
629 Princeton Circle W	63	60	68	69	70	7
625 Princeton Circle W	63	63	69	70	71	8
621 Princeton Circle W	63	64	71	72	72	9
617 Princeton Circle W	63	65	71	72	73	10
613 Princeton Circle W	63	65	71	72	73	10
609 Princeton Circle W	63	65	69	70	71	8
605 Princeton Circle W	63	64	67	69	70	7
601 Princeton Circle W	63	65	67	69	70	7
545 Princeton Circle W	63	64	63	67	68	5

**Table 12. Property Line Maximum Hourly Sound Exposure Level for 1500 Home Spectators and 500 Visitor Spectators**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	58	63	64	66	4
600 E Glenwood Avenue	62	59	63	65	66	4
637 Princeton Circle W	62	58	66	67	68	6
633 Princeton Circle W	63	61	68	69	70	7
629 Princeton Circle W	63	60	68	69	70	7
625 Princeton Circle W	63	62	69	70	71	8
621 Princeton Circle W	63	63	70	71	71	8
617 Princeton Circle W	63	63	70	71	71	8
613 Princeton Circle W	63	63	70	71	71	8
609 Princeton Circle W	63	63	69	70	71	8
605 Princeton Circle W	63	63	67	69	70	7
601 Princeton Circle W	63	63	67	69	70	7
545 Princeton Circle W	63	62	64	66	68	5

**Table 13. Property Line Maximum Hourly Sound Exposure Level for 2000 Home Spectators No Visitor Seating**

Receptor	Existing Sound Level, $L_{eq}$ (dB(A)) <sup>a</sup>	Predicted Sound Levels, $L_{eq}$ (dB(A))			Cumulative Future Sound Level, $L_{eq}$ (dB(A))	Existing to Future Sound Level Increase (dB)
		Crowd	PA System	Total		
601 E Glenwood Avenue	62	57	64	65	67	5
600 E Glenwood Avenue	62	57	63	64	66	4
637 Princeton Circle W	62	57	66	67	68	6
633 Princeton Circle W	63	60	67	68	69	6
629 Princeton Circle W	63	59	67	68	69	6
625 Princeton Circle W	63	62	68	69	70	7
621 Princeton Circle W	63	63	70	71	71	8
617 Princeton Circle W	63	64	70	71	72	9
613 Princeton Circle W	63	64	70	71	72	9
609 Princeton Circle W	63	64	68	69	70	7
605 Princeton Circle W	63	63	66	68	69	6
601 Princeton Circle W	63	64	66	68	69	6
545 Princeton Circle W	63	63	62	66	67	4

## CONCLUSIONS AND DISCUSSION

VA has been contracted to conduct an acoustical study of the proposed Sherbeck Field renovation at Fullerton College in Fullerton, California and to evaluate the potential for sound exposure from the proposed project. VA has utilized a variety of modeling techniques as well as on-site acoustical measurements to determine the predicted sound exposure with respect to existing sound levels.

The Fullerton Municipal Code (FMC) specifies sound level limits from various sources at noise-sensitive receptor locations. However, the FMC exempts educational facilities, including athletic activities, from these sound level limits.

For receptors close to the project site, there is predicted to be an increase in overall sound level during athletic activities on Sherbeck Field. The increase of sound level is primarily due to the conservatively predicted sound levels generated by the speaker / PA system proposed for the project.

Regardless of reduction of sound level from the speaker system or crowd, it is very unlikely that athletic events could be held at close proximity to the nearby residential receptors without events being audible or measurable above existing sound levels. However, this study represents periods of maximum hourly sound level exposure (i.e. high crowd capacity, relatively loud speaker sound levels). Therefore, sound exposure at these nearby residences would likely be limited to high capacity athletic events such as evening games.

Given the infeasibility of traditional sound level mitigation measures and the exemption of educational facility projects in the FMC, VA recommends utilizing the directional loudspeakers, similar to the JBL AW266-LS loudspeakers, for a focused public-address system. VA recommends that sound levels from both speech and music be continuously normalized while in use to ensure that they are not excessively loud, and the PA system is utilized at the lowest possible sound level while preserving the intended use of the facility.

Please do not hesitate to contact us if you have any questions regarding the materials presented in this report.

Sincerely,

**Veneklasen Associates, Inc.**



Jack Briskie  
Associate



Stephen A. Martin, Ph.D., P.E.  
Associate Principal

## APPENDIX A. DEFINITIONS OF ACOUSTICAL TERMS

Term	Definition
<b>Decibel (dB)</b>	A unit describing the amplitude of sound in a logarithmic ratio to a reference value.
<b>A-weighted Decibels (dBA)</b>	A filter applied to sound pressure levels in decibel to simulate the response of the human ear at the threshold of hearing. A-weighting de-emphasizes the low frequency components of a sound similar to the human ear at these levels. This metric has been closely tied to subjective reactions of annoyance to noise, and is used as a noise metric in this and in many other environmental acoustics reports. In this report, all dBA levels reported refer to the sound pressure level, referenced to 20 $\mu$ Pa
<b>Sound Pressure Level (<math>L_p</math>)</b>	The amplitude of sound compared to the reference value of 20 $\mu$ Pa. Sound Pressure Level is what we perceive as audible sound. Sound Pressure Level decreases as distance from the source to the receiver increases. All sound values discussed in this report refer to Sound Pressure Levels.
<b>Equivalent Sound Level (<math>L_{eq}</math>)</b>	The time-weighted average sound level for a given period of time. Use of this metric allows the observation of the overall sound level for the measurement period.
<b>Sound Power Level (<math>L_w</math>)</b>	The amplitude of sound compared to the reference value of 1pW. Sound Power Level does not vary with distance, and represents the level of sound emitted by a given source. The sound power level is generally used to model the sound pressure level of a source at a given distance or location.
<b>Ambient Noise Level</b>	As defined in the Fullerton Municipal Code, the ambient noise level is “the all-encompassing noise level associated with a given environment... at the location and approximate time at which a comparison with the alleged offensive noise is to be made”. This report defines the “ambient” noise level as the existing noise level at a residential receptor location prior to the proposed project installation.
<b>Sound Level Percentile (<math>L_n</math>)</b>	Also referred to as a “statistical sound level”, $L_n$ refers to the noise level that is exceeded for nth percent of a given measurement period. For example, $L_{50}$ refers to the noise level that is exceeded for 50% of a measurement period, i.e. 30 minutes out of an hour. These metrics can be used to evaluate noise levels that are apparent for a given period of time at a measurement location.



#### APPENDIX B. SITE LT-1 MEASURED SOUND LEVELS

Start Time (mm/dd/yyyy hh:mm)	Hourly Measured Sound Level (dB(A) re: 20μPa)						
	L <sub>eq</sub>	L <sub>10</sub>	L <sub>25</sub>	L <sub>33</sub>	L <sub>50</sub>	L <sub>75</sub>	L <sub>90</sub>
12/15/2017 10:00	68	69	65	63	59	55	53
12/15/2017 11:00	65	69	66	64	60	56	55
12/15/2017 12:00	65	69	67	65	61	57	54
12/15/2017 13:00	65	69	66	64	61	56	53
12/15/2017 14:00	66	70	67	65	62	57	55
12/15/2017 15:00	67	71	68	67	64	60	58
12/15/2017 16:00	67	71	68	67	64	60	58
12/15/2017 17:00	66	70	68	66	63	60	58
12/15/2017 18:00	65	69	66	64	60	57	55
12/15/2017 19:00	63	67	63	61	57	54	52
12/15/2017 20:00	63	67	62	60	56	54	53
12/15/2017 21:00	70	67	62	59	55	52	51
12/15/2017 22:00	61	66	60	57	53	51	50
12/15/2017 23:00	60	63	57	54	51	50	49
12/16/2017 00:00	57	58	53	51	49	47	46
12/16/2017 01:00	55	56	50	48	46	46	45
12/16/2017 02:00	54	52	46	46	45	45	44
12/16/2017 03:00	53	52	47	46	45	45	45
12/16/2017 04:00	55	56	51	48	46	45	45
12/16/2017 05:00	58	60	54	52	48	46	46
12/16/2017 06:00	59	61	52	50	49	47	46
12/16/2017 07:00	63	66	60	58	53	51	50
12/16/2017 08:00	63	67	63	61	58	55	54
12/16/2017 09:00	63	68	64	62	58	54	53
12/16/2017 10:00	64	68	65	63	59	54	52
12/16/2017 11:00	64	68	65	63	59	55	53
12/16/2017 12:00	65	69	66	64	61	56	55
12/16/2017 13:00	65	69	66	64	60	56	54
12/16/2017 14:00	71	69	65	63	59	55	54

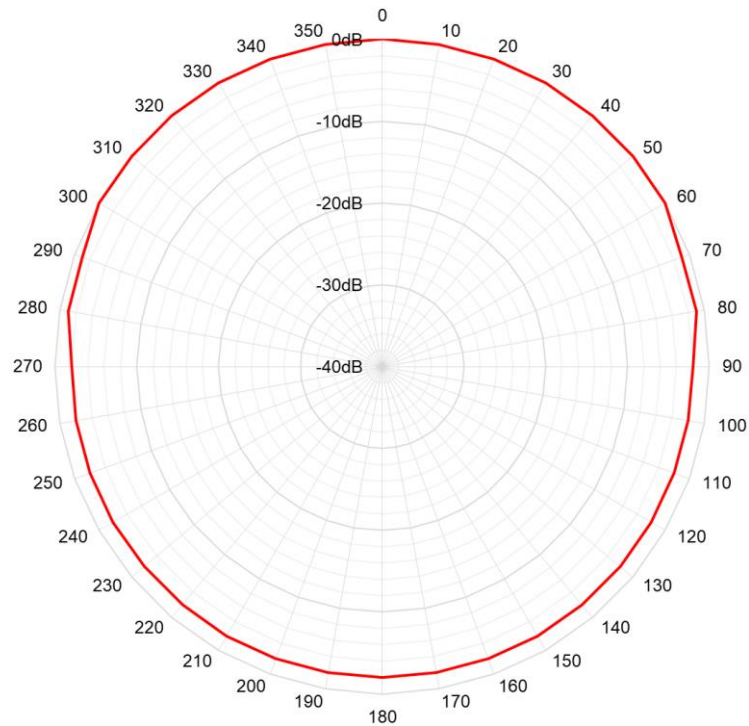
**Site LT-1 Measured Sound Levels (Continued, Page 2)**

Start Time (mm/dd/yyyy hh:mm)	Hourly Measured Sound Level (dB(A) re: 20μPa)						
	L <sub>eq</sub>	L <sub>10</sub>	L <sub>25</sub>	L <sub>33</sub>	L <sub>50</sub>	L <sub>75</sub>	L <sub>90</sub>
12/16/2017 15:00	69	69	66	64	60	56	55
12/16/2017 16:00	65	69	66	64	59	55	53
12/16/2017 17:00	65	69	65	63	59	54	52
12/16/2017 18:00	63	67	63	60	56	52	51
12/16/2017 19:00	62	67	62	60	55	52	50
12/16/2017 20:00	62	66	61	58	53	50	48
12/16/2017 21:00	61	65	60	57	53	49	48
12/16/2017 22:00	61	65	58	55	50	48	47
12/16/2017 23:00	59	63	56	53	49	47	47
12/17/2017 00:00	56	58	51	50	49	49	48
12/17/2017 01:00	56	56	51	49	48	47	47
12/17/2017 02:00	55	52	47	46	45	44	43
12/17/2017 03:00	50	48	43	41	41	40	40
12/17/2017 04:00	51	48	43	42	41	40	40
12/17/2017 05:00	55	54	45	42	41	40	40
12/17/2017 06:00	56	56	47	45	42	41	41
12/17/2017 07:00	59	63	55	52	48	45	45
12/17/2017 08:00	61	66	59	56	51	48	46
12/17/2017 09:00	63	67	62	59	55	51	49
12/17/2017 10:00	62	67	62	60	57	53	51
12/17/2017 11:00	63	67	63	61	58	55	53
12/17/2017 12:00	63	68	64	61	57	53	52
12/17/2017 13:00	63	68	64	61	57	53	51
12/17/2017 14:00	63	68	64	61	56	51	49
12/17/2017 15:00	63	67	63	61	56	52	50
12/17/2017 16:00	63	68	64	61	56	51	49
12/17/2017 17:00	62	67	63	60	56	51	49
12/17/2017 18:00	61	66	61	58	54	49	47
12/17/2017 19:00	61	66	60	57	53	49	47

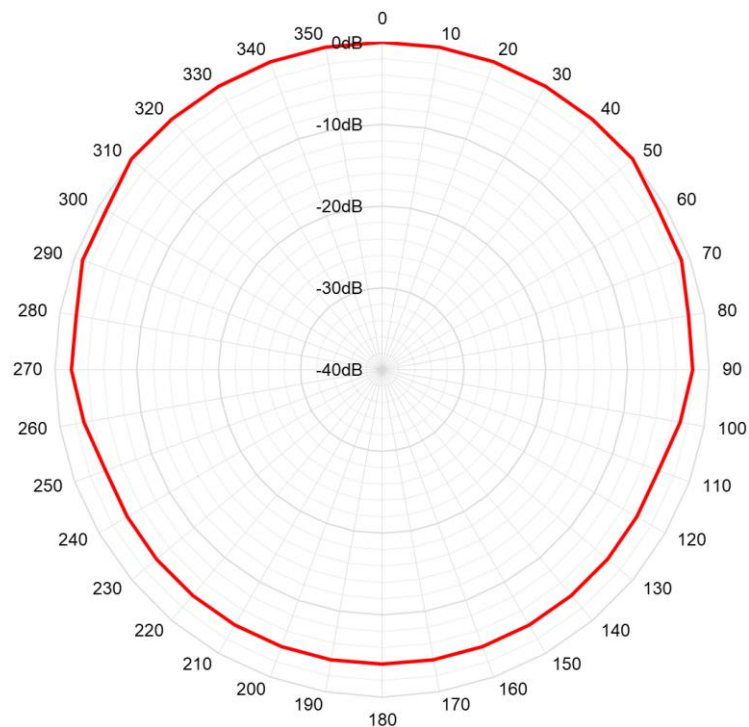
**Site LT-1 Measured Sound Levels (Continued, Page 3)**

Start Time (mm/dd/yyyy hh:mm)	Hourly Measured Sound Level (dB(A) re: 20μPa)						
	L <sub>eq</sub>	L <sub>10</sub>	L <sub>25</sub>	L <sub>33</sub>	L <sub>50</sub>	L <sub>75</sub>	L <sub>90</sub>
12/17/2017 20:00	60	65	59	56	51	49	47
12/17/2017 21:00	59	63	56	53	49	48	47
12/17/2017 22:00	57	61	52	49	47	45	45
12/17/2017 23:00	55	57	49	46	44	43	43
12/18/2017 00:00	52	51	45	44	42	41	41
12/18/2017 01:00	50	47	43	42	40	40	39
12/18/2017 02:00	49	48	42	41	40	39	39
12/18/2017 03:00	49	48	44	43	42	41	41
12/18/2017 04:00	54	53	49	48	47	46	45
12/18/2017 05:00	59	62	54	52	50	49	48
12/18/2017 06:00	63	67	61	58	54	52	51
12/18/2017 07:00	67	71	68	67	63	59	57

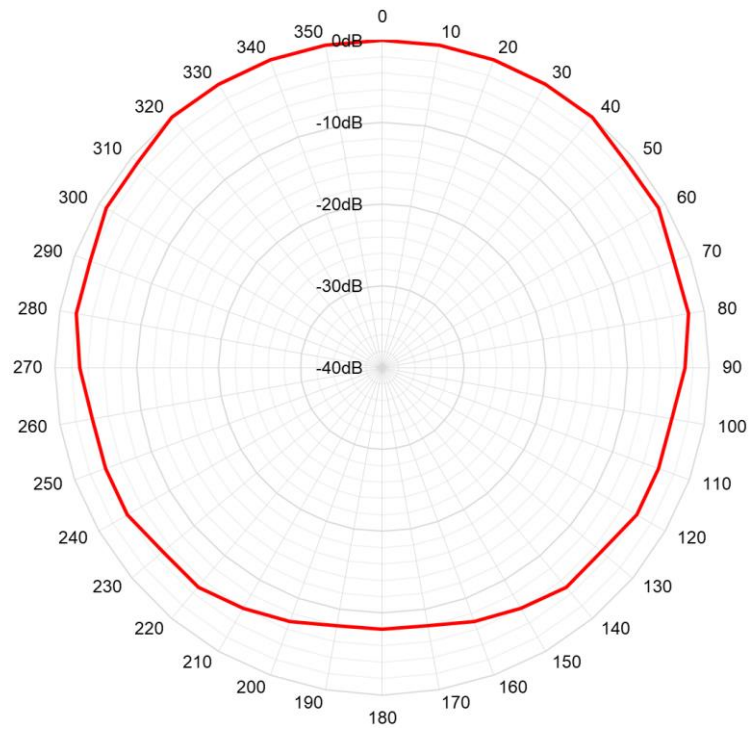
**APPENDIX C. L-ACOUSTICS, INC. SPEAKER ARRAY DIRECTIVITY DIAGRAMS**



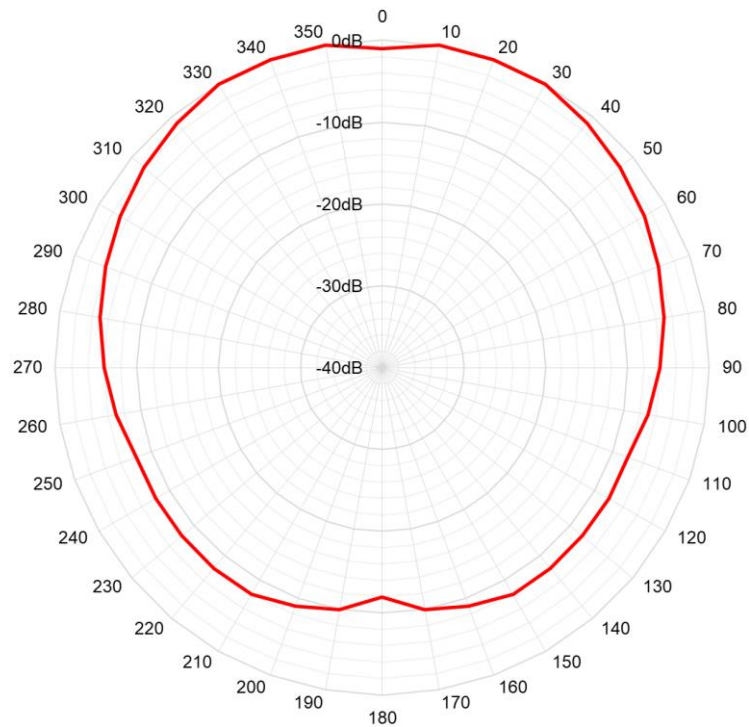
**Figure 9. Arc Focus/Wide Array (Home Sideline) – 63 Hz Directivity (dB/°)**



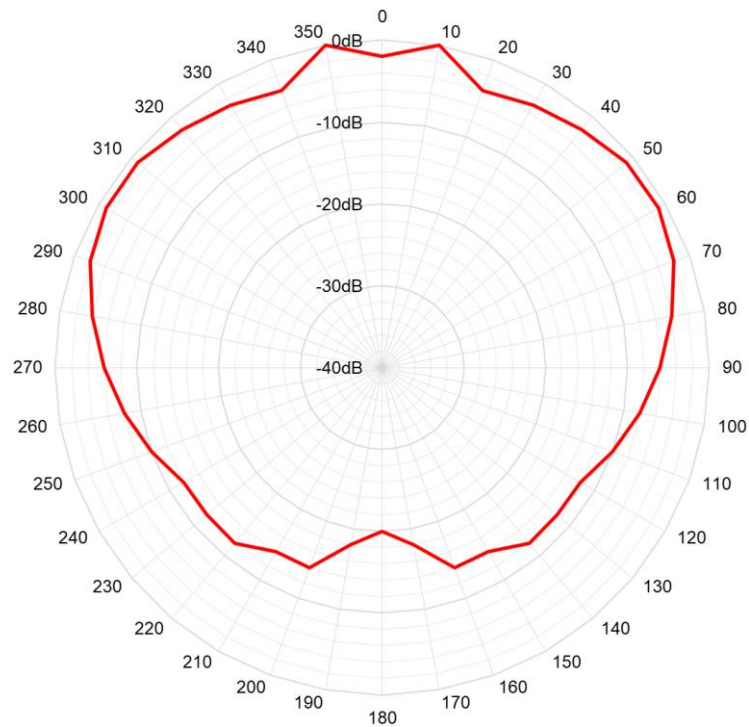
**Figure 10. Arc Focus/Wide Array (Home Sideline) – 125 Hz Directivity (dB/°)**



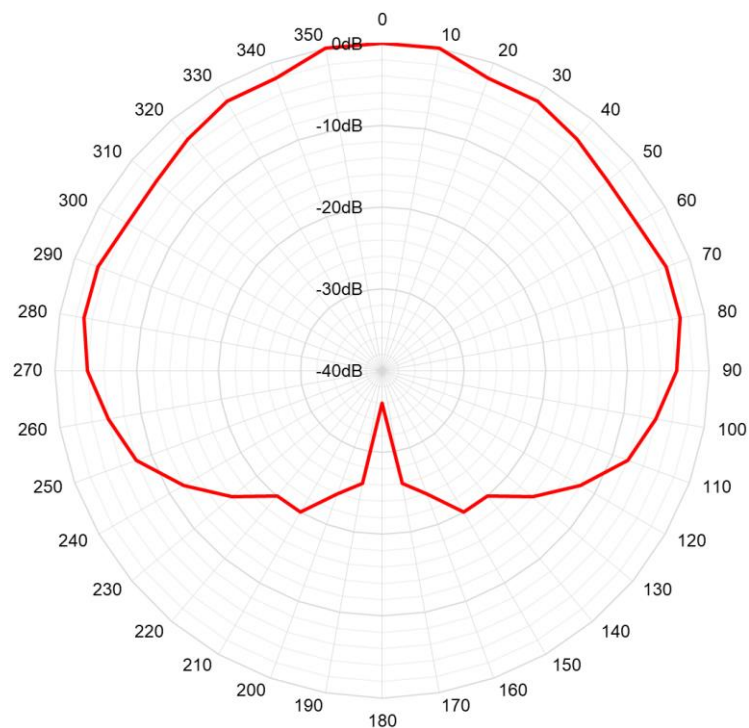
**Figure 11. Arc Focus/Wide Array (Home Sideline) – 250 Hz Directivity (dB/°)**



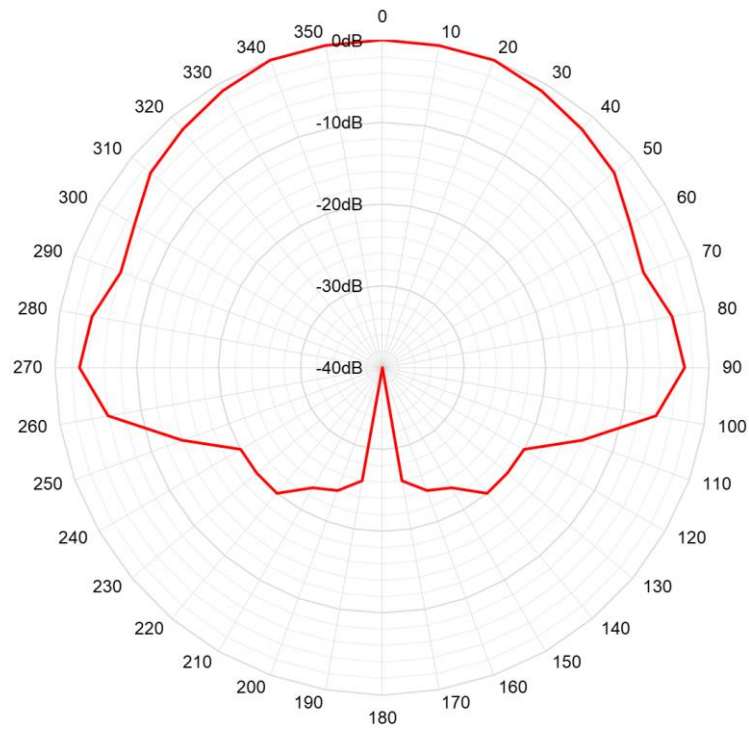
**Figure 12. Arc Focus/Wide Array (Home Sideline) – 500 Hz Directivity (dB/°)**



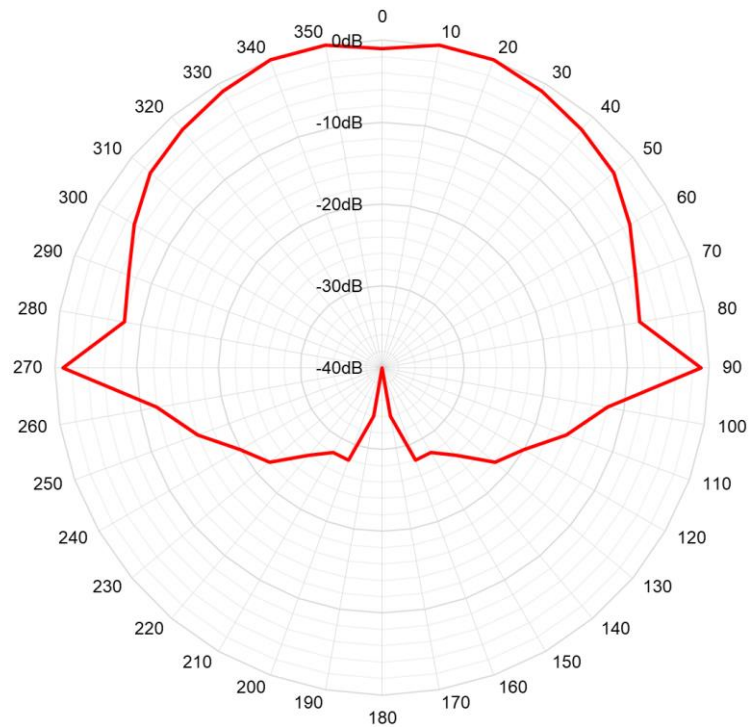
**Figure 13. Arc Focus/Wide Array (Home Sideline) – 1000 Hz Directivity (dB/°)**



**Figure 14. Arc Focus/Wide Array (Home Sideline) – 2000 Hz Directivity (dB/°)**

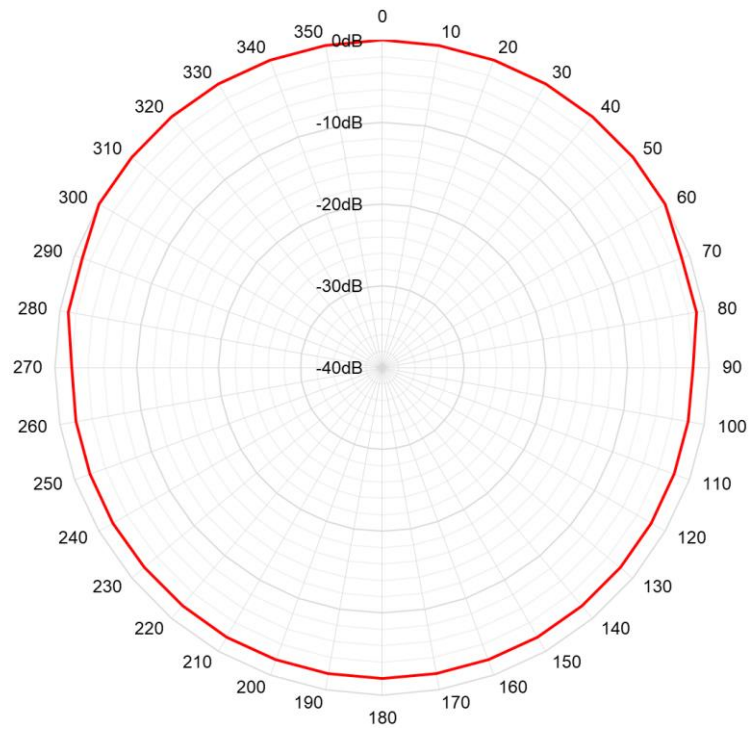


**Figure 15. Arc Focus/Wide Array (Home Sideline) – 4000 Hz Directivity (dB/°)**

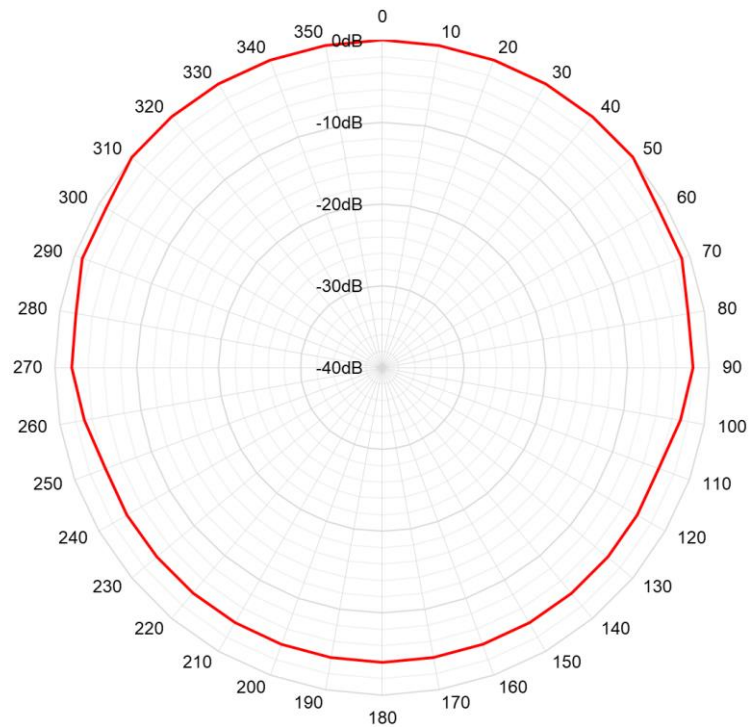


**Figure 16. Arc Focus/Wide Array (Home Sideline) – 8000 Hz Directivity (dB/°)**



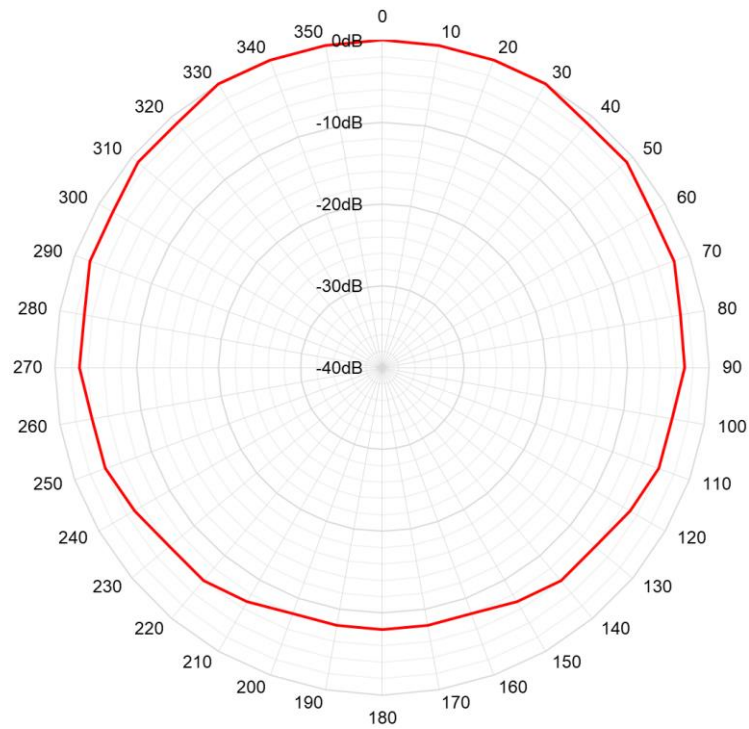


**Figure 17. Arc Focus/Focus Array (Visitor Sideline) – 63 Hz Directivity (dB/°)**

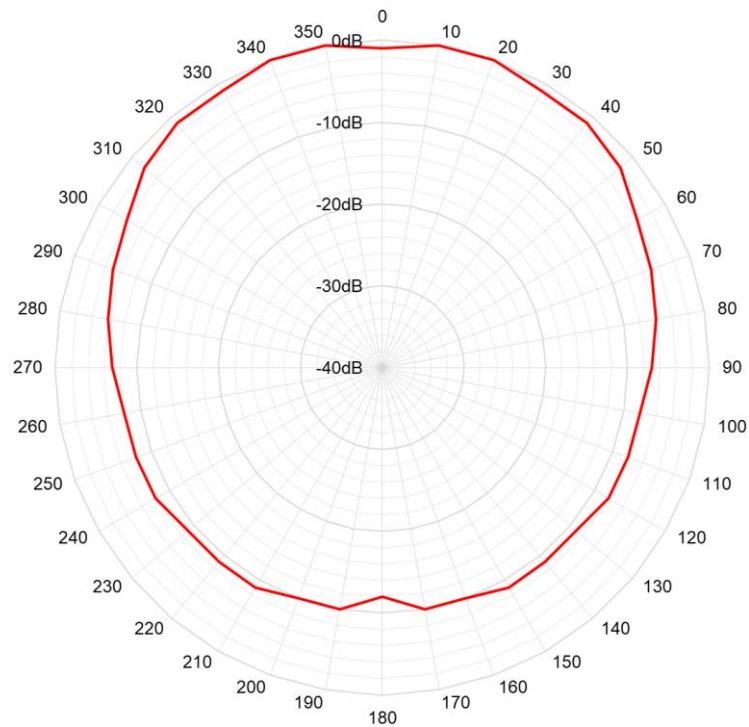


**Figure 18. Arc Focus/Focus Array (Visitor Sideline) – 125 Hz Directivity (dB/°)**

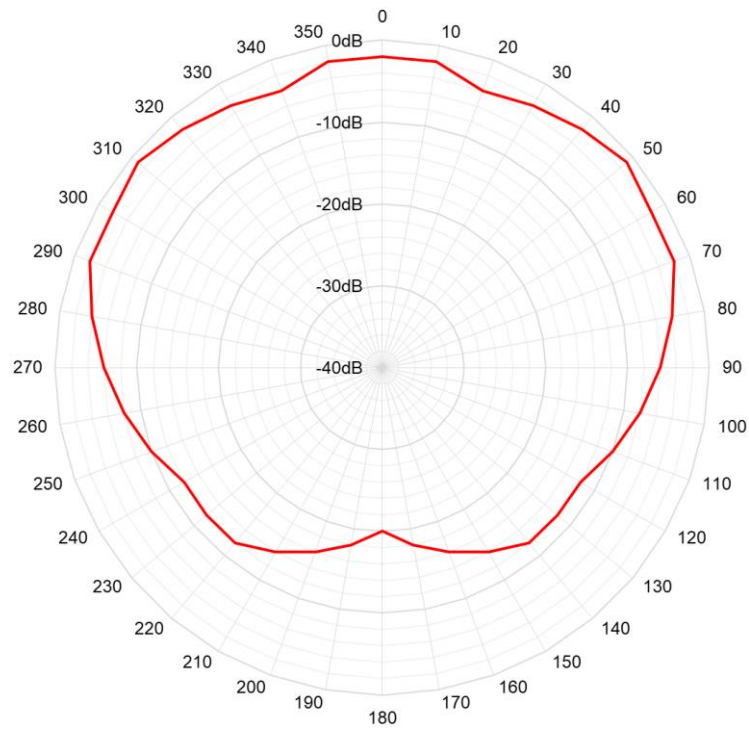




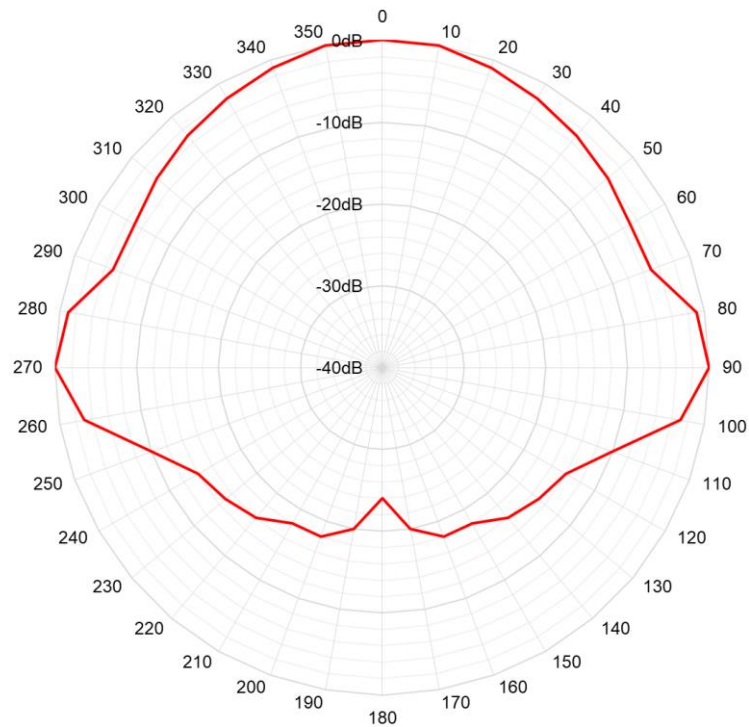
**Figure 19. Arc Focus/Focus Array (Visitor Sideline) – 250 Hz Directivity (dB/°)**



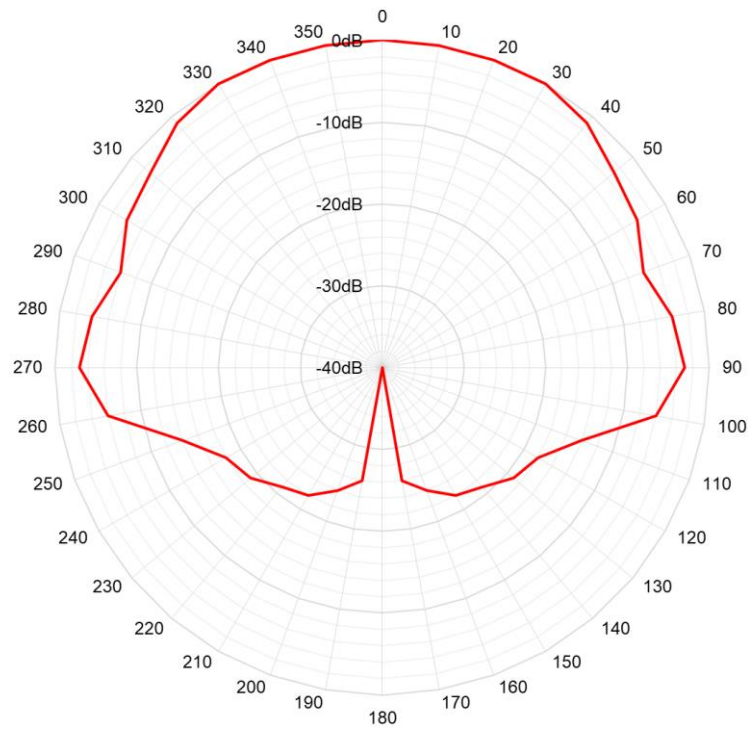
**Figure 20. Arc Focus/Focus Array (Visitor Sideline) – 500 Hz Directivity (dB/°)**



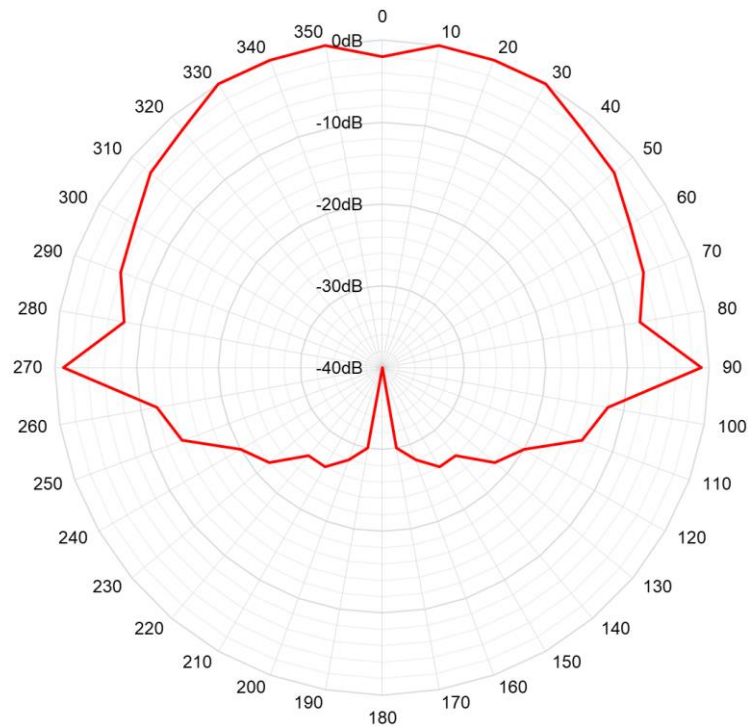
**Figure 21. Arc Focus/Focus Array (Visitor Sideline) – 1000 Hz Directivity (dB/°)**



**Figure 22. Arc Focus/Focus Array (Visitor Sideline) – 2000 Hz Directivity (dB/°)**



**Figure 23. Arc Focus/Focus Array (Visitor Sideline) – 4000 Hz Directivity (dB/°)**



**Figure 24. Arc Focus/Focus Array (Visitor Sideline) – 8000 Hz Directivity (dB/°)**



#### APPENDIX D. L-ACOUSTICS, INC. SPEAKER (PA) SYSTEM SOUND LEVEL CONTOUR FIGURES

Note that all contour figures in this section show A-weighted octave band sound levels for direct comparison with overall levels.

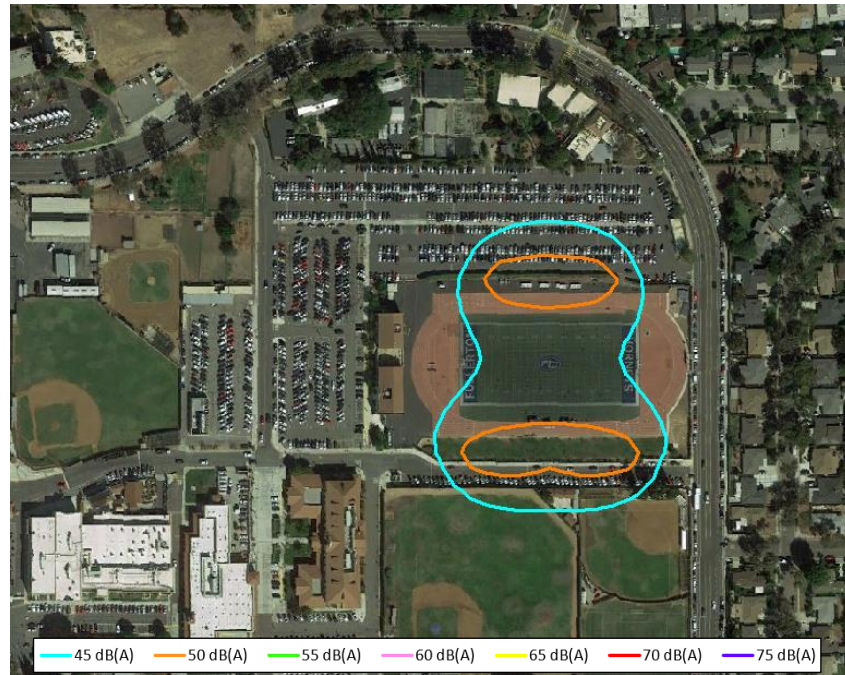


Figure 25. A-Weighted Sound Exposure from PA System – 63 Hz

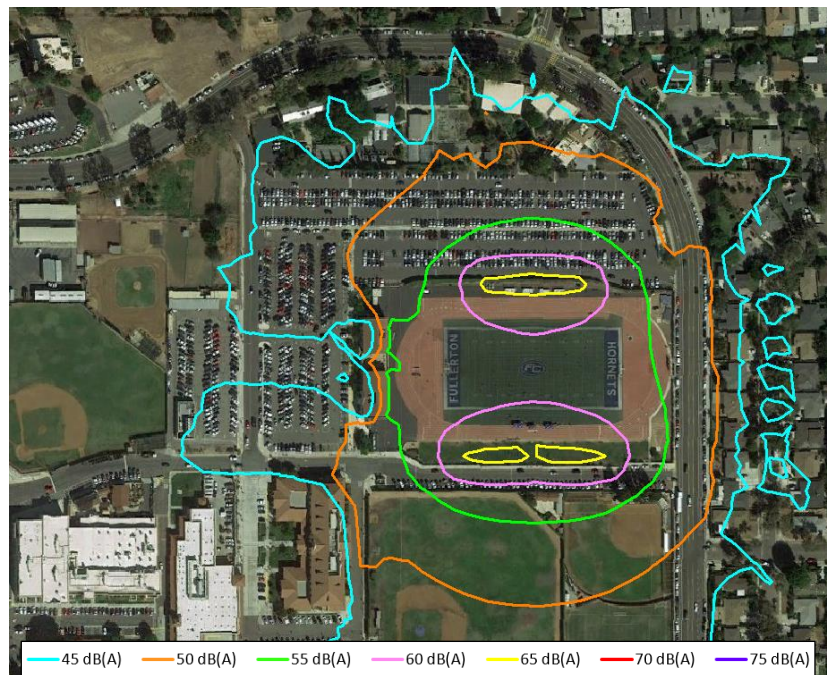
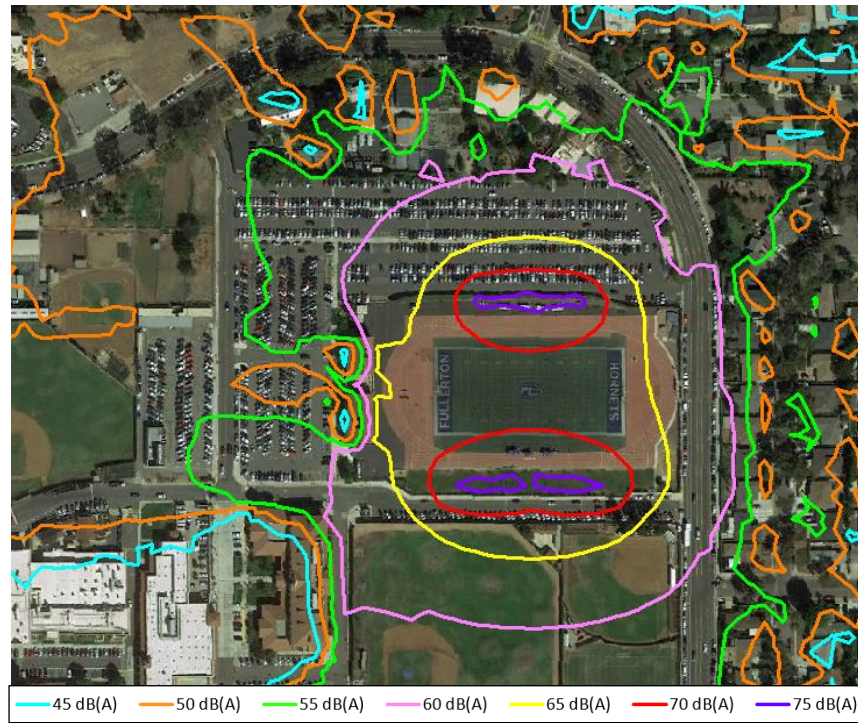
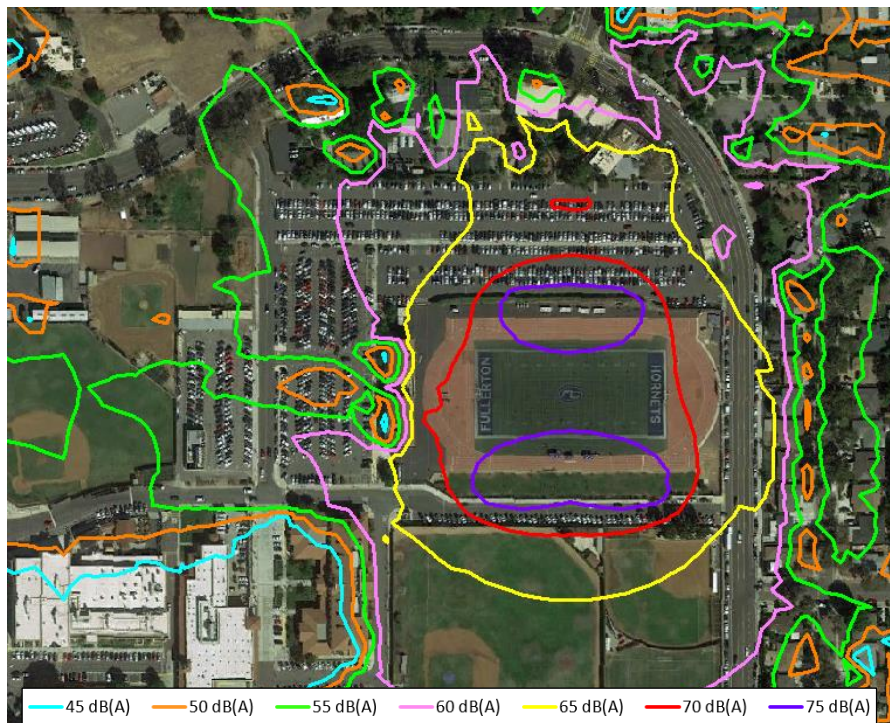


Figure 26. A-Weighted Sound Exposure from PA System – 125 Hz



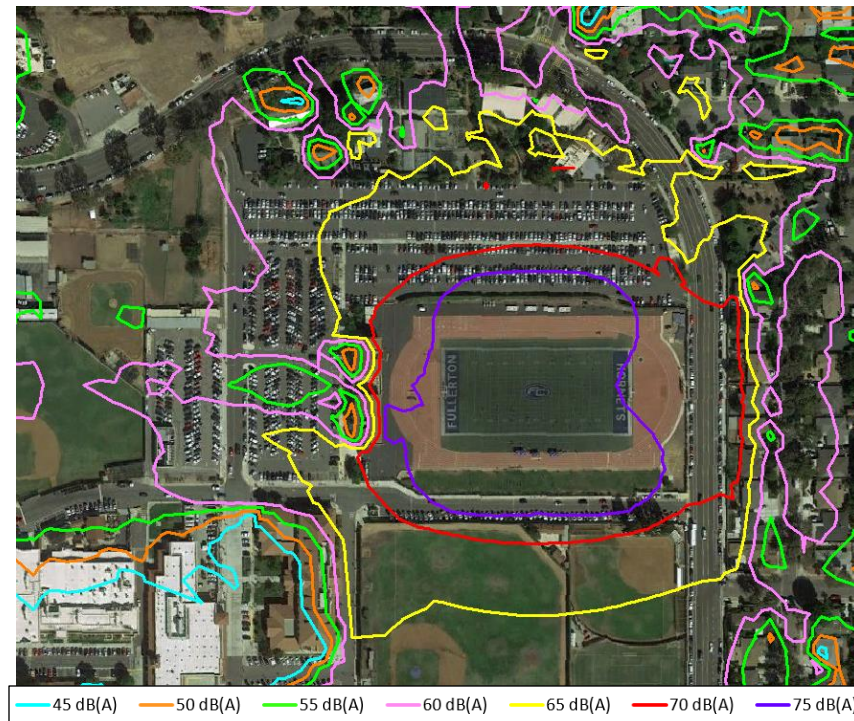


**Figure 27. A-Weighted Sound Exposure from PA System – 250 Hz**

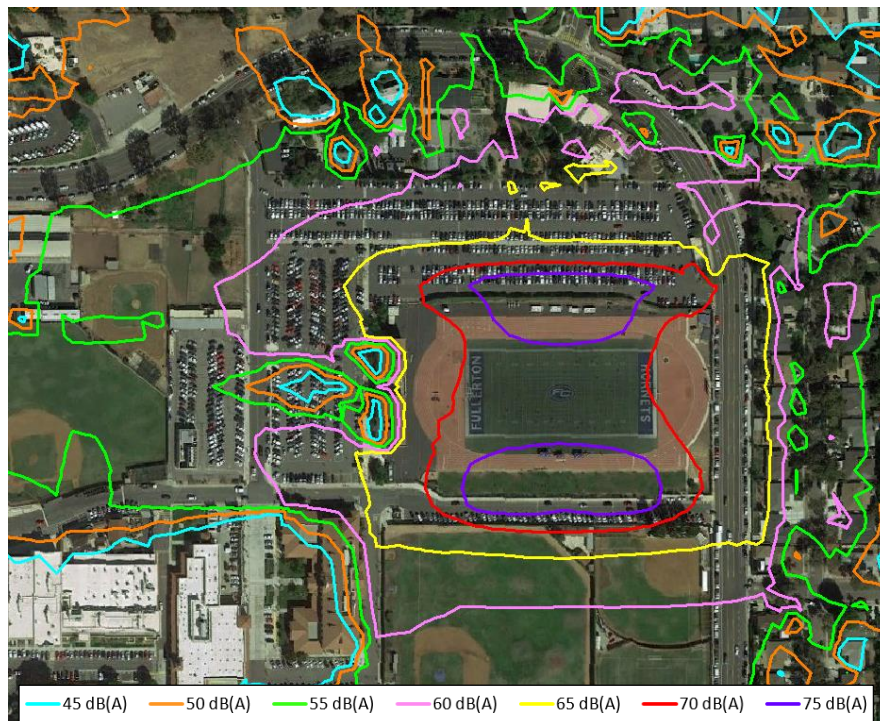


**Figure 28. A-Weighted Sound Exposure from PA System – 500 Hz**



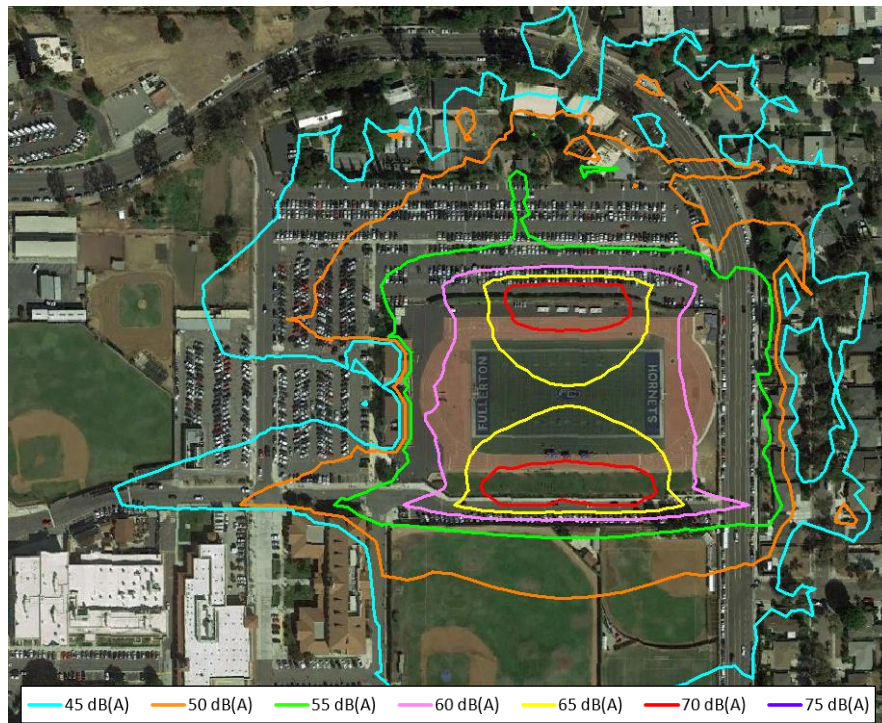


**Figure 29. A-Weighted Sound Exposure from PA System – 1000 Hz**

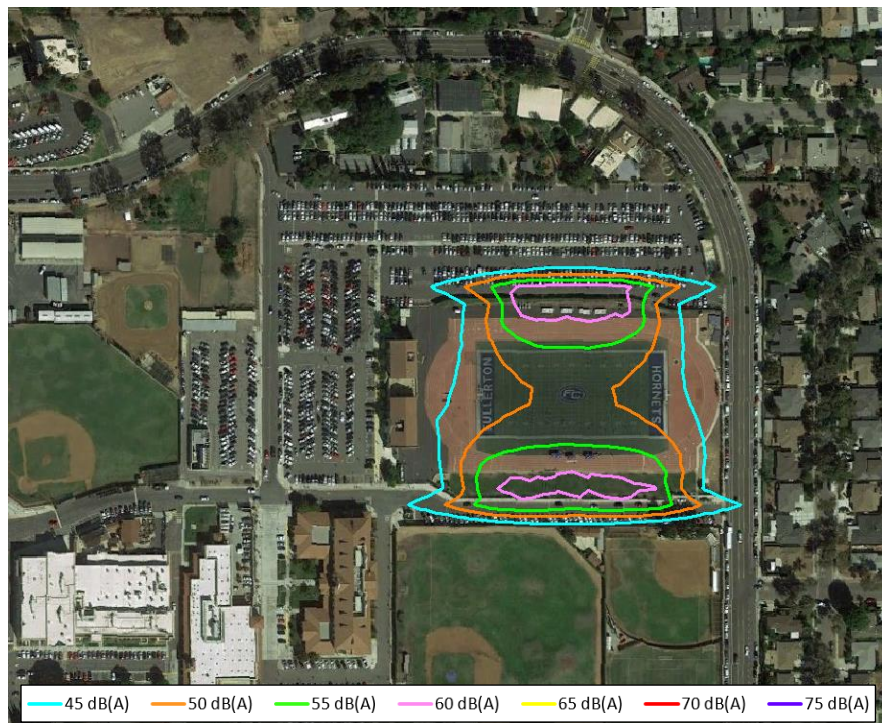


**Figure 30. A-Weighted Sound Exposure from PA System – 2000 Hz**





**Figure 31. A-Weighted Sound Exposure from PA System – 4000 Hz**



**Figure 32. A-Weighted Sound Exposure from PA System – 8000 Hz**

APPENDIX **E**-3  
*Traffic Noise Modeling*  
*Input and Output*





**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>9 July 2018</b>							
<b>PROJECT/CONTRACT:</b>				<b>TNM 2.5</b>							
<b>RUN:</b>				<b>Sherbeck Field EXISTING WEEKDAY PM</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXISTING WEEKDAY PM											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	2123	30	44	30	22	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	1461	30	30	30	15	30	0	0	0	0
	point12	12	1461	30	30	30	15	30	0	0	0	0
	point13	13	1461	30	30	30	15	30	0	0	0	0
	point14	14	1461	30	30	30	15	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	642	25	13	25	7	25	0	0	0	0
	point37	37	642	25	13	25	7	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	912	25	19	25	9	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	1115	25	23	25	11	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1687	25	35	25	17	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1894	25	39	25	20	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2222	30	46	30	23	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2892	40	60	40	30	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2929	40	60	40	30	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	200	25	4	25	2	25	0	0	0	0
	point32	32	200	25	4	25	2	25	0	0	0	0
	point33	33	200	25	4	25	2	25	0	0	0	0
	point34	34	200	25	4	25	2	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	1151	35	24	35	12	35	0	0	0	0
	point16	16	1151	35	24	35	12	35	0	0	0	0
	point17	17	1151	35	24	35	12	35	0	0	0	0
	point18	18	1151	35	24	35	12	35	0	0	0	0
	point19	19	1151	35	24	35	12	35	0	0	0	0
	point20	20	1151	35	24	35	12	35	0	0	0	0
	point21	21	1151	35	24	35	12	35	0	0	0	0
	point22	22	1151	35	24	35	12	35	0	0	0	0
	point23	23	1151	35	24	35	12	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	837	35	17	35	9	35	0	0	0	0
	point25	25	837	35	17	35	9	35	0	0	0	0
	point26	26	837	35	17	35	9	35	0	0	0	0
	point27	27	837	35	17	35	9	35	0	0	0	0
	point28	28	837	35	17	35	9	35	0	0	0	0
	point29	29	837	35	17	35	9	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	991	35	20	35	10	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:		10488									
RUN:		Sherbeck Field EXISTING WEEKDAY PM									
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXISTING WEEKDAY PM																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Incr-	Ht #Up	Perturbs #Dn	On Struct?
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		



**INPUT: BARRIERS**
**10488**

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing	No Barrier						With Barrier			
			LAeq1h	LAeq1h						Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n	Impact		LAeq1h	Calculated	Goal	Calculated
							Sub'l Inc						minus
													Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
M1	1	1	0.0	67.0	66	67.0	10	Snd Lvl		67.0	0.0	8	-8.0
M2	2	1	0.0	67.1	66	67.1	10	Snd Lvl		67.1	0.0	8	-8.0
M3	3	1	0.0	67.6	66	67.6	10	Snd Lvl		67.6	0.0	8	-8.0
M4	4	1	0.0	55.0	66	55.0	10	----		55.0	0.0	8	-8.0
M5	5	1	0.0	60.7	66	60.7	10	----		60.7	0.0	8	-8.0
M6	6	1	0.0	66.6	66	66.6	10	Snd Lvl		66.6	0.0	8	-8.0
M7	7	1	0.0	59.8	66	59.8	10	----		59.8	0.0	8	-8.0
M8	8	1	0.0	56.7	66	56.7	10	----		56.7	0.0	8	-8.0
M9	9	1	0.0	65.2	66	65.2	10	----		65.2	0.0	8	-8.0
M10	10	1	0.0	65.0	66	65.0	10	----		65.0	0.0	8	-8.0
M11	11	1	0.0	67.5	66	67.5	10	Snd Lvl		67.5	0.0	8	-8.0
M12	12	1	0.0	63.5	66	63.5	10	----		63.5	0.0	8	-8.0
M13	13	1	0.0	61.6	66	61.6	10	----		61.6	0.0	8	-8.0
M14	14	1	0.0	66.6	66	66.6	10	Snd Lvl		66.6	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		6	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>Average pavement type shall be used unless</b>							
<b>PROJECT/CONTRACT:</b>				<b>a State highway agency substantiates the use</b>							
<b>RUN:</b>				<b>of a different type with the approval of FHWA</b>							
<b>PROJECT/CONTRACT:</b>				<b>10488</b>							
<b>RUN:</b>				<b>Sherbeck Field EXIST P PROJ WKDY PM</b>							
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXIST P PROJ WKDY PM											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	2148	30	44	30	22	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	1468	30	30	30	15	30	0	0	0	0
	point12	12	1468	30	30	30	15	30	0	0	0	0
	point13	13	1468	30	30	30	15	30	0	0	0	0
	point14	14	1468	30	30	30	15	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	642	25	13	25	7	25	0	0	0	0
	point37	37	642	25	13	25	7	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	912	25	19	25	9	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	1119	25	23	25	12	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1711	25	35	25	18	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1904	25	39	25	20	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2232	30	46	30	23	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2915	40	60	40	30	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2948	40	61	40	30	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	200	25	4	25	2	25	0	0	0	0
	point32	32	200	25	4	25	2	25	0	0	0	0
	point33	33	200	25	4	25	2	25	0	0	0	0
	point34	34	200	25	4	25	2	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	1168	35	24	35	12	35	0	0	0	0
	point16	16	1168	35	24	35	12	35	0	0	0	0
	point17	17	1168	35	24	35	12	35	0	0	0	0
	point18	18	1168	35	24	35	12	35	0	0	0	0
	point19	19	1168	35	24	35	12	35	0	0	0	0
	point20	20	1168	35	24	35	12	35	0	0	0	0
	point21	21	1168	35	24	35	12	35	0	0	0	0
	point22	22	1168	35	24	35	12	35	0	0	0	0
	point23	23	1168	35	24	35	12	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	837	35	17	35	9	35	0	0	0	0
	point25	25	837	35	17	35	9	35	0	0	0	0
	point26	26	837	35	17	35	9	35	0	0	0	0
	point27	27	837	35	17	35	9	35	0	0	0	0
	point28	28	837	35	17	35	9	35	0	0	0	0
	point29	29	837	35	17	35	9	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1024	35	21	35	11	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field EXIST P PROJ WKDY PM										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXIST P PROJ WKDY PM																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	



## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

**RESULTS: SOUND LEVELS**
**10488**

Dudek MG													
<b>RESULTS: SOUND LEVELS</b>													
<b>PROJECT/CONTRACT:</b>													
<b>RUN:</b>													
<b>BARRIER DESIGN:</b>													
<b>ATMOSPHERICS:</b>													
<b>Receiver</b>													
<b>Name</b>	<b>No.</b>	<b>#DUs</b>	<b>Existing</b>	<b>No Barrier</b>					<b>With Barrier</b>				
			<b>LAeq1h</b>	<b>LAeq1h</b>			<b>Increase over existing</b>	<b>Type</b>	<b>Calculated</b>	<b>Noise Reduction</b>			
				<b>Calculated</b>	<b>Crit'n</b>	<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>LAeq1h</b>	<b>Calculated</b>	<b>Goal</b>	<b>Calculated</b>	
							<b>Sub'l Inc</b>					<b>minus</b>	
												<b>Goal</b>	
			<b>dBA</b>	<b>dBA</b>	<b>dBA</b>	<b>dB</b>	<b>dB</b>		<b>dBA</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>	
M1	1	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0	
M2	2	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0	
M3	3	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0	
M4	4	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0	
M5	5	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0	
M6	6	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0	
M7	7	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0	
M8	8	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0	
M9	9	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0	
M10	10	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0	
M11	11	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0	
M12	12	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0	
M13	13	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0	
M14	14	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0	
<b>Dwelling Units</b>		<b># DUs</b>	<b>Noise Reduction</b>										
			<b>Min</b>	<b>Avg</b>	<b>Max</b>								
			<b>dB</b>	<b>dB</b>	<b>dB</b>								
All Selected		14	0.0	0.0	0.0								
All Impacted		6	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>9 July 2018</b>							
<b>PROJECT/CONTRACT:</b>				<b>TNM 2.5</b>							
<b>RUN:</b>				<b>Sherbeck Field EXISTING SAT ARRIVAL</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXISTING SAT ARRIVAL											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	1306	30	27	30	13	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	674	30	14	30	7	30	0	0	0	0
	point12	12	674	30	14	30	7	30	0	0	0	0
	point13	13	674	30	14	30	7	30	0	0	0	0
	point14	14	674	30	14	30	7	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	398	25	8	25	4	25	0	0	0	0
	point37	37	398	25	8	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	568	25	12	25	6	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	487	25	10	25	5	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	761	25	16	25	8	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	987	25	20	25	10	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	1232	30	25	30	13	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	1440	40	30	40	15	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	1524	40	31	40	16	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	59	25	1	25	1	25	0	0	0	0
	point32	32	59	25	1	25	1	25	0	0	0	0
	point33	33	59	25	1	25	1	25	0	0	0	0
	point34	34	59	25	1	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	669	35	14	35	7	35	0	0	0	0
	point16	16	669	35	14	35	7	35	0	0	0	0
	point17	17	669	35	14	35	7	35	0	0	0	0
	point18	18	669	35	14	35	7	35	0	0	0	0
	point19	19	669	35	14	35	7	35	0	0	0	0
	point20	20	669	35	14	35	7	35	0	0	0	0
	point21	21	669	35	14	35	7	35	0	0	0	0
	point22	22	669	35	14	35	7	35	0	0	0	0
	point23	23	669	35	14	35	7	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	502	35	10	35	5	35	0	0	0	0
	point25	25	502	35	10	35	5	35	0	0	0	0
	point26	26	502	35	10	35	5	35	0	0	0	0
	point27	27	502	35	10	35	5	35	0	0	0	0
	point28	28	502	35	10	35	5	35	0	0	0	0
	point29	29	502	35	10	35	5	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	280	35	6	35	3	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field	EXISTING SAT ARRIVAL									
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y



## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXISTING SAT ARRIVAL																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

**RESULTS: SOUND LEVELS**
**10488**

Dudek													
MG													
<b>RESULTS: SOUND LEVELS</b>													
<b>PROJECT/CONTRACT:</b>													
<b>RUN:</b>													
<b>BARRIER DESIGN:</b>													
<b>ATMOSPHERICS:</b>													
<b>Receiver</b>													
<b>Name</b>	<b>No.</b>	<b>#DUs</b>	<b>Existing</b>	<b>No Barrier</b>						<b>With Barrier</b>			
			<b>LAeq1h</b>	<b>LAeq1h</b>			<b>Increase over existing</b>	<b>Type</b>		<b>Calculated</b>	<b>Noise Reduction</b>		
				<b>Calculated</b>	<b>Crit'n</b>		<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>LAeq1h</b>	<b>Calculated</b>	<b>Goal</b>	<b>Calculated</b>
								<b>Sub'l Inc</b>					<b>minus</b>
													<b>Goal</b>
			<b>dBA</b>	<b>dBA</b>	<b>dBA</b>	<b>dB</b>	<b>dB</b>			<b>dBA</b>	<b>dB</b>	<b>dB</b>	<b>dB</b>
M1	1	1	0.0	64.4	66	64.4	10	----		64.4	0.0	8	-8.0
M2	2	1	0.0	64.8	66	64.8	10	----		64.8	0.0	8	-8.0
M3	3	1	0.0	62.6	66	62.6	10	----		62.6	0.0	8	-8.0
M4	4	1	0.0	52.6	66	52.6	10	----		52.6	0.0	8	-8.0
M5	5	1	0.0	58.7	66	58.7	10	----		58.7	0.0	8	-8.0
M6	6	1	0.0	64.1	66	64.1	10	----		64.1	0.0	8	-8.0
M7	7	1	0.0	56.4	66	56.4	10	----		56.4	0.0	8	-8.0
M8	8	1	0.0	52.1	66	52.1	10	----		52.1	0.0	8	-8.0
M9	9	1	0.0	62.6	66	62.6	10	----		62.6	0.0	8	-8.0
M10	10	1	0.0	62.1	66	62.1	10	----		62.1	0.0	8	-8.0
M11	11	1	0.0	64.5	66	64.5	10	----		64.5	0.0	8	-8.0
M12	12	1	0.0	60.9	66	60.9	10	----		60.9	0.0	8	-8.0
M13	13	1	0.0	58.3	66	58.3	10	----		58.3	0.0	8	-8.0
M14	14	1	0.0	64.4	66	64.4	10	----		64.4	0.0	8	-8.0
<b>Dwelling Units</b>		<b># DUs</b>	<b>Noise Reduction</b>										
			<b>Min</b>	<b>Avg</b>	<b>Max</b>								
			<b>dB</b>	<b>dB</b>	<b>dB</b>								
All Selected		14	0.0	0.0	0.0								
All Impacted		0	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>											
<b>PROJECT/CONTRACT:</b>				10488							
<b>RUN:</b>				Sherbeck Field EXIST PP SAT ARRIVAL							
<b>Roadway</b>				<b>Points</b>							
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>				<b>Segment</b>
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXIST PP SAT ARRIVAL											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	1714	30	35	30	18	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	795	30	16	30	8	30	0	0	0	0
	point12	12	795	30	16	30	8	30	0	0	0	0
	point13	13	795	30	16	30	8	30	0	0	0	0
	point14	14	795	30	16	30	8	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	398	25	8	25	4	25	0	0	0	0
	point37	37	398	25	8	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	568	25	12	25	6	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	638	25	13	25	7	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1246	25	26	25	13	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1276	25	26	25	13	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	1626	30	34	30	17	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2136	40	44	40	22	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2068	40	43	40	21	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	59	25	1	25	1	25	0	0	0	0
	point32	32	59	25	1	25	1	25	0	0	0	0
	point33	33	59	25	1	25	1	25	0	0	0	0
	point34	34	59	25	1	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	880	35	18	35	9	35	0	0	0	0
	point16	16	880	35	18	35	9	35	0	0	0	0
	point17	17	880	35	18	35	9	35	0	0	0	0
	point18	18	880	35	18	35	9	35	0	0	0	0
	point19	19	880	35	18	35	9	35	0	0	0	0
	point20	20	880	35	18	35	9	35	0	0	0	0
	point21	21	880	35	18	35	9	35	0	0	0	0
	point22	22	880	35	18	35	9	35	0	0	0	0
	point23	23	880	35	18	35	9	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	583	35	12	35	6	35	0	0	0	0
	point25	25	583	35	12	35	6	35	0	0	0	0
	point26	26	583	35	12	35	6	35	0	0	0	0
	point27	27	583	35	12	35	6	35	0	0	0	0
	point28	28	583	35	12	35	6	35	0	0	0	0
	point29	29	583	35	12	35	6	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1187	35	24	35	12	35	0	0	0	0
	point31	31										



**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field EXIST PP SAT ARRIVAL										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXIST PP SAT ARRIVAL																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:		10488											
RUN:		Sherbeck Field EXIST PP SAT ARRIVAL											
BARRIER DESIGN:		INPUT HEIGHTS											
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	65.9	66		65.9	10	----	65.9	0.0	8	-8.0
M2	2	1	0.0	65.5	66		65.5	10	----	65.5	0.0	8	-8.0
M3	3	1	0.0	67.9	66		67.9	10	Snd Lvl	67.9	0.0	8	-8.0
M4	4	1	0.0	53.7	66		53.7	10	----	53.7	0.0	8	-8.0
M5	5	1	0.0	58.8	66		58.8	10	----	58.8	0.0	8	-8.0
M6	6	1	0.0	64.7	66		64.7	10	----	64.7	0.0	8	-8.0
M7	7	1	0.0	57.1	66		57.1	10	----	57.1	0.0	8	-8.0
M8	8	1	0.0	52.9	66		52.9	10	----	52.9	0.0	8	-8.0
M9	9	1	0.0	63.9	66		63.9	10	----	63.9	0.0	8	-8.0
M10	10	1	0.0	63.2	66		63.2	10	----	63.2	0.0	8	-8.0
M11	11	1	0.0	66.1	66		66.1	10	Snd Lvl	66.1	0.0	8	-8.0
M12	12	1	0.0	61.8	66		61.8	10	----	61.8	0.0	8	-8.0
M13	13	1	0.0	59.5	66		59.5	10	----	59.5	0.0	8	-8.0
M14	14	1	0.0	65.6	66		65.6	10	----	65.6	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		2	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>								<b>Average pavement type shall be used unless</b>			
<b>PROJECT/CONTRACT:</b>				<b>10488</b>				<b>a State highway agency substantiates the use</b>			
<b>RUN:</b>				<b>Sherbeck Field EXISTING SAT DEPARTU</b>				<b>of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	60.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXISTING SAT DEPARTU											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	1289	30	27	30	13	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	532	30	11	30	5	30	0	0	0	0
	point12	12	532	30	11	30	5	30	0	0	0	0
	point13	13	532	30	11	30	5	30	0	0	0	0
	point14	14	532	30	11	30	5	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	397	25	8	25	4	25	0	0	0	0
	point37	37	397	25	8	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	495	25	10	25	5	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	498	25	10	25	5	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	727	25	15	25	7	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	839	25	17	25	9	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	1221	30	25	30	13	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	1409	40	29	40	15	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	1489	40	31	40	15	40	0	0	0	0



**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	65	25	1	25	1	25	0	0	0	0
	point32	32	65	25	1	25	1	25	0	0	0	0
	point33	33	65	25	1	25	1	25	0	0	0	0
	point34	34	65	25	1	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	498	35	10	35	5	35	0	0	0	0
	point16	16	498	35	10	35	5	35	0	0	0	0
	point17	17	498	35	10	35	5	35	0	0	0	0
	point18	18	498	35	10	35	5	35	0	0	0	0
	point19	19	498	35	10	35	5	35	0	0	0	0
	point20	20	498	35	10	35	5	35	0	0	0	0
	point21	21	498	35	10	35	5	35	0	0	0	0
	point22	22	498	35	10	35	5	35	0	0	0	0
	point23	23	498	35	10	35	5	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	351	35	7	35	4	35	0	0	0	0
	point25	25	351	35	7	35	4	35	0	0	0	0
	point26	26	351	35	7	35	4	35	0	0	0	0
	point27	27	351	35	7	35	4	35	0	0	0	0
	point28	28	351	35	7	35	4	35	0	0	0	0
	point29	29	351	35	7	35	4	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	249	35	5	35	3	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek											
MG											
<b>INPUT: RECEIVERS</b> <b>PROJECT/CONTRACT: 10488</b> <b>RUN: Sherbeck Field EXISTING SAT DEPARTU</b>											
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXISTING SAT DEPARTU																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h						With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n	Impact					
							Sub'l Inc						
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
M1	1	1	0.0	63.1	66	63.1	10	----		63.1	0.0	8	-8.0
M2	2	1	0.0	63.4	66	63.4	10	----		63.4	0.0	8	-8.0
M3	3	1	0.0	62.2	66	62.2	10	----		62.2	0.0	8	-8.0
M4	4	1	0.0	51.3	66	51.3	10	----		51.3	0.0	8	-8.0
M5	5	1	0.0	58.0	66	58.0	10	----		58.0	0.0	8	-8.0
M6	6	1	0.0	63.3	66	63.3	10	----		63.3	0.0	8	-8.0
M7	7	1	0.0	55.4	66	55.4	10	----		55.4	0.0	8	-8.0
M8	8	1	0.0	52.3	66	52.3	10	----		52.3	0.0	8	-8.0
M9	9	1	0.0	62.6	66	62.6	10	----		62.6	0.0	8	-8.0
M10	10	1	0.0	61.5	66	61.5	10	----		61.5	0.0	8	-8.0
M11	11	1	0.0	64.4	66	64.4	10	----		64.4	0.0	8	-8.0
M12	12	1	0.0	60.8	66	60.8	10	----		60.8	0.0	8	-8.0
M13	13	1	0.0	58.3	66	58.3	10	----		58.3	0.0	8	-8.0
M14	14	1	0.0	64.4	66	64.4	10	----		64.4	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		0	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>9 July 2018</b>							
<b>PROJECT/CONTRACT:</b>				<b>TNM 2.5</b>							
<b>RUN:</b>				<b>Sherbeck Field EXISTI PP SAT DEPARTU</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					



**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field EXISTI PP SAT DEPARTU											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	1727	30	36	30	18	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	661	30	14	30	7	30	0	0	0	0
	point12	12	661	30	14	30	7	30	0	0	0	0
	point13	13	661	30	14	30	7	30	0	0	0	0
	point14	14	661	30	14	30	7	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	397	25	8	25	4	25	0	0	0	0
	point37	37	397	25	8	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	495	25	10	25	5	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	660	25	14	25	7	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1245	25	26	25	13	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1148	25	24	25	12	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	1642	30	34	30	17	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2153	40	44	40	22	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2072	40	43	40	21	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	65	25	1	25	1	25	0	0	0	0
	point32	32	65	25	1	25	1	25	0	0	0	0
	point33	33	65	25	1	25	1	25	0	0	0	0
	point34	34	65	25	1	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	868	35	18	35	9	35	0	0	0	0
	point16	16	868	35	18	35	9	35	0	0	0	0
	point17	17	868	35	18	35	9	35	0	0	0	0
	point18	18	868	35	18	35	9	35	0	0	0	0
	point19	19	868	35	18	35	9	35	0	0	0	0
	point20	20	868	35	18	35	9	35	0	0	0	0
	point21	21	868	35	18	35	9	35	0	0	0	0
	point22	22	868	35	18	35	9	35	0	0	0	0
	point23	23	868	35	18	35	9	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	722	35	15	35	7	35	0	0	0	0
	point25	25	722	35	15	35	7	35	0	0	0	0
	point26	26	722	35	15	35	7	35	0	0	0	0
	point27	27	722	35	15	35	7	35	0	0	0	0
	point28	28	722	35	15	35	7	35	0	0	0	0
	point29	29	722	35	15	35	7	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1220	35	25	35	13	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek											
MG											
<b>INPUT: RECEIVERS</b> <b>PROJECT/CONTRACT: 10488</b> <b>RUN: Sherbeck Field EXISTI PP SAT DEPARTU</b>											
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field EXISTI PP SAT DEPARTU																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:		10488											
RUN:		Sherbeck Field EXISTI PP SAT DEPARTU											
BARRIER DESIGN:		INPUT HEIGHTS											
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	66.6	66		66.6	10	Snd Lvl	66.6	0.0	8	-8.0
M2	2	1	0.0	66.4	66		66.4	10	Snd Lvl	66.4	0.0	8	-8.0
M3	3	1	0.0	68.1	66		68.1	10	Snd Lvl	68.1	0.0	8	-8.0
M4	4	1	0.0	53.7	66		53.7	10	----	53.7	0.0	8	-8.0
M5	5	1	0.0	58.2	66		58.2	10	----	58.2	0.0	8	-8.0
M6	6	1	0.0	64.3	66		64.3	10	----	64.3	0.0	8	-8.0
M7	7	1	0.0	56.4	66		56.4	10	----	56.4	0.0	8	-8.0
M8	8	1	0.0	53.1	66		53.1	10	----	53.1	0.0	8	-8.0
M9	9	1	0.0	63.9	66		63.9	10	----	63.9	0.0	8	-8.0
M10	10	1	0.0	62.8	66		62.8	10	----	62.8	0.0	8	-8.0
M11	11	1	0.0	66.2	66		66.2	10	Snd Lvl	66.2	0.0	8	-8.0
M12	12	1	0.0	61.9	66		61.9	10	----	61.9	0.0	8	-8.0
M13	13	1	0.0	59.6	66		59.6	10	----	59.6	0.0	8	-8.0
M14	14	1	0.0	65.6	66		65.6	10	----	65.6	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		4	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>								<b>Average pavement type shall be used unless</b>			
<b>PROJECT/CONTRACT:</b>				<b>10488</b>				<b>a State highway agency substantiates the use</b>			
<b>RUN:</b>				<b>Sherbeck Field YR 2030 WEEKDAY PM</b>				<b>of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	



**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field YR 2030 WEEKDAY PM											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	3163	30	65	30	33	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	1677	30	35	30	17	30	0	0	0	0
	point12	12	1677	30	35	30	17	30	0	0	0	0
	point13	13	1677	30	35	30	17	30	0	0	0	0
	point14	14	1677	30	35	30	17	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	684	25	14	25	7	25	0	0	0	0
	point37	37	684	25	14	25	7	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	1026	25	21	25	11	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	1504	25	31	25	16	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	2107	25	43	25	22	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	2467	25	51	25	25	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	3347	30	69	30	35	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	4255	40	88	40	44	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	4433	40	91	40	46	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	245	25	5	25	3	25	0	0	0	0
	point32	32	245	25	5	25	3	25	0	0	0	0
	point33	33	245	25	5	25	3	25	0	0	0	0
	point34	34	245	25	5	25	3	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	1310	35	27	35	14	35	0	0	0	0
	point16	16	1310	35	27	35	14	35	0	0	0	0
	point17	17	1310	35	27	35	14	35	0	0	0	0
	point18	18	1310	35	27	35	14	35	0	0	0	0
	point19	19	1310	35	27	35	14	35	0	0	0	0
	point20	20	1310	35	27	35	14	35	0	0	0	0
	point21	21	1310	35	27	35	14	35	0	0	0	0
	point22	22	1310	35	27	35	14	35	0	0	0	0
	point23	23	1310	35	27	35	14	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	964	35	20	35	10	35	0	0	0	0
	point25	25	964	35	20	35	10	35	0	0	0	0
	point26	26	964	35	20	35	10	35	0	0	0	0
	point27	27	964	35	20	35	10	35	0	0	0	0
	point28	28	964	35	20	35	10	35	0	0	0	0
	point29	29	964	35	20	35	10	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1208	35	25	35	12	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek											
MG											
<b>INPUT: RECEIVERS</b> <b>PROJECT/CONTRACT: 10488</b> <b>RUN: Sherbeck Field YR 2030 WEEKDAY PM</b>											
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field YR 2030 WEEKDAY PM																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Incre-	Ht #Up	Perturbs #Dn	On Struct?
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	67.7	66		67.7	10	Snd Lvl	67.7	0.0	8	-8.0
M2	2	1	0.0	67.6	66		67.6	10	Snd Lvl	67.6	0.0	8	-8.0
M3	3	1	0.0	68.6	66		68.6	10	Snd Lvl	68.6	0.0	8	-8.0
M4	4	1	0.0	55.6	66		55.6	10	----	55.6	0.0	8	-8.0
M5	5	1	0.0	61.3	66		61.3	10	----	61.3	0.0	8	-8.0
M6	6	1	0.0	67.2	66		67.2	10	Snd Lvl	67.2	0.0	8	-8.0
M7	7	1	0.0	60.4	66		60.4	10	----	60.4	0.0	8	-8.0
M8	8	1	0.0	57.9	66		57.9	10	----	57.9	0.0	8	-8.0
M9	9	1	0.0	66.9	66		66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M10	10	1	0.0	66.1	66		66.1	10	Snd Lvl	66.1	0.0	8	-8.0
M11	11	1	0.0	69.2	66		69.2	10	Snd Lvl	69.2	0.0	8	-8.0
M12	12	1	0.0	64.8	66		64.8	10	----	64.8	0.0	8	-8.0
M13	13	1	0.0	63.1	66		63.1	10	----	63.1	0.0	8	-8.0
M14	14	1	0.0	68.3	66		68.3	10	Snd Lvl	68.3	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		8	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								



**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>9 July 2018</b>							
<b>PROJECT/CONTRACT:</b>				<b>TNM 2.5</b>							
<b>RUN:</b>				<b>Sherbeck Field Yr2030 P PRJ WKDY PM</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>				<b>Segment</b>
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field Yr2030 P PRJ WKDY PM											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	3187	30	66	30	33	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	1684	30	35	30	17	30	0	0	0	0
	point12	12	1684	30	35	30	17	30	0	0	0	0
	point13	13	1684	30	35	30	17	30	0	0	0	0
	point14	14	1684	30	35	30	17	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	684	25	14	25	7	25	0	0	0	0
	point37	37	684	25	14	25	7	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	1026	25	21	25	11	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	1508	25	31	25	16	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	2131	25	44	25	22	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	2476	25	51	25	26	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	3356	30	69	30	35	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	4279	40	88	40	44	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	4451	40	92	40	46	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	245	25	5	25	3	25	0	0	0	0
	point32	32	245	25	5	25	3	25	0	0	0	0
	point33	33	245	25	5	25	3	25	0	0	0	0
	point34	34	245	25	5	25	3	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	1326	35	27	35	14	35	0	0	0	0
	point16	16	1326	35	27	35	14	35	0	0	0	0
	point17	17	1326	35	27	35	14	35	0	0	0	0
	point18	18	1326	35	27	35	14	35	0	0	0	0
	point19	19	1326	35	27	35	14	35	0	0	0	0
	point20	20	1326	35	27	35	14	35	0	0	0	0
	point21	21	1326	35	27	35	14	35	0	0	0	0
	point22	22	1326	35	27	35	14	35	0	0	0	0
	point23	23	1326	35	27	35	14	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	964	35	20	35	10	35	0	0	0	0
	point25	25	964	35	20	35	10	35	0	0	0	0
	point26	26	964	35	20	35	10	35	0	0	0	0
	point27	27	964	35	20	35	10	35	0	0	0	0
	point28	28	964	35	20	35	10	35	0	0	0	0
	point29	29	964	35	20	35	10	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1241	35	26	35	13	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek											
MG											
<b>INPUT: RECEIVERS</b> <b>PROJECT/CONTRACT: 10488</b> <b>RUN: Sherbeck Field Yr2030 P PRJ WKDY PM</b>											
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.1	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field Yr2030 P PRJ WKDY PM																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates	(bottom)	Height	Segment				
		Min	Max	\$ per Unit	\$ per Unit	Top Width	Run:Rise	\$ per Unit				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
				Area	Vol.			Length								Incre-	#Up	#Dn	Reflec-
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					



## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h						With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n	Impact					
							Sub'l Inc						
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
M1	1	1	0.0	67.7	66	67.7	10	Snd Lvl		67.7	0.0	8	-8.0
M2	2	1	0.0	67.6	66	67.6	10	Snd Lvl		67.6	0.0	8	-8.0
M3	3	1	0.0	68.7	66	68.7	10	Snd Lvl		68.7	0.0	8	-8.0
M4	4	1	0.0	55.6	66	55.6	10	----		55.6	0.0	8	-8.0
M5	5	1	0.0	61.3	66	61.3	10	----		61.3	0.0	8	-8.0
M6	6	1	0.0	67.2	66	67.2	10	Snd Lvl		67.2	0.0	8	-8.0
M7	7	1	0.0	60.4	66	60.4	10	----		60.4	0.0	8	-8.0
M8	8	1	0.0	57.9	66	57.9	10	----		57.9	0.0	8	-8.0
M9	9	1	0.0	66.9	66	66.9	10	Snd Lvl		66.9	0.0	8	-8.0
M10	10	1	0.0	66.2	66	66.2	10	Snd Lvl		66.2	0.0	8	-8.0
M11	11	1	0.0	69.2	66	69.2	10	Snd Lvl		69.2	0.0	8	-8.0
M12	12	1	0.0	64.8	66	64.8	10	----		64.8	0.0	8	-8.0
M13	13	1	0.0	63.1	66	63.1	10	----		63.1	0.0	8	-8.0
M14	14	1	0.0	68.3	66	68.3	10	Snd Lvl		68.3	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		8	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>											
<b>PROJECT/CONTRACT:</b>				10488							
<b>RUN:</b>				Sherbeck Field YR 2030 SAT ARRIVAL							
<b>Roadway</b>				<b>Points</b>							
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>				<b>Segment</b>
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field YR 2030 SAT ARRIVAL											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	2011	30	41	30	21	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	784	30	16	30	8	30	0	0	0	0
	point12	12	784	30	16	30	8	30	0	0	0	0
	point13	13	784	30	16	30	8	30	0	0	0	0
	point14	14	784	30	16	30	8	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	425	25	9	25	4	25	0	0	0	0
	point37	37	425	25	9	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	651	25	13	25	7	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	751	25	15	25	8	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	972	25	20	25	10	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1360	25	28	25	14	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2044	30	42	30	21	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2351	40	48	40	24	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2553	40	53	40	26	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	88	25	2	25	1	25	0	0	0	0
	point32	32	88	25	2	25	1	25	0	0	0	0
	point33	33	88	25	2	25	1	25	0	0	0	0
	point34	34	88	25	2	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	747	35	15	35	8	35	0	0	0	0
	point16	16	747	35	15	35	8	35	0	0	0	0
	point17	17	747	35	15	35	8	35	0	0	0	0
	point18	18	747	35	15	35	8	35	0	0	0	0
	point19	19	747	35	15	35	8	35	0	0	0	0
	point20	20	747	35	15	35	8	35	0	0	0	0
	point21	21	747	35	15	35	8	35	0	0	0	0
	point22	22	747	35	15	35	8	35	0	0	0	0
	point23	23	747	35	15	35	8	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	570	35	12	35	6	35	0	0	0	0
	point25	25	570	35	12	35	6	35	0	0	0	0
	point26	26	570	35	12	35	6	35	0	0	0	0
	point27	27	570	35	12	35	6	35	0	0	0	0
	point28	28	570	35	12	35	6	35	0	0	0	0
	point29	29	570	35	12	35	6	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	360	35	7	35	4	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field YR 2030 SAT ARRIVAL										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field YR 2030 SAT ARRIVAL																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Incre-	Ht #Up	Perturbs #Dn	On Struct?
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		



INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:		10488											
RUN:		Sherbeck Field YR 2030 SAT ARRIVAL											
BARRIER DESIGN:		INPUT HEIGHTS											
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	65.1	66		65.1	10	----	65.1	0.0	8	-8.0
M2	2	1	0.0	65.4	66		65.4	10	----	65.4	0.0	8	-8.0
M3	3	1	0.0	64.0	66		64.0	10	----	64.0	0.0	8	-8.0
M4	4	1	0.0	53.1	66		53.1	10	----	53.1	0.0	8	-8.0
M5	5	1	0.0	59.3	66		59.3	10	----	59.3	0.0	8	-8.0
M6	6	1	0.0	64.8	66		64.8	10	----	64.8	0.0	8	-8.0
M7	7	1	0.0	57.1	66		57.1	10	----	57.1	0.0	8	-8.0
M8	8	1	0.0	53.6	66		53.6	10	----	53.6	0.0	8	-8.0
M9	9	1	0.0	64.7	66		64.7	10	----	64.7	0.0	8	-8.0
M10	10	1	0.0	63.5	66		63.5	10	----	63.5	0.0	8	-8.0
M11	11	1	0.0	66.6	66		66.6	10	Snd Lvl	66.6	0.0	8	-8.0
M12	12	1	0.0	62.4	66		62.4	10	----	62.4	0.0	8	-8.0
M13	13	1	0.0	60.2	66		60.2	10	----	60.2	0.0	8	-8.0
M14	14	1	0.0	66.3	66		66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		2	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>											
<b>PROJECT/CONTRACT:</b>				10488							
<b>RUN:</b>				Sherbeck Field YR2030 PP SAT ARRVL							
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>				<b>Segment</b>
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field YR2030 PP SAT ARRVL											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	2419	30	50	30	25	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	905	30	19	30	9	30	0	0	0	0
	point12	12	905	30	19	30	9	30	0	0	0	0
	point13	13	905	30	19	30	9	30	0	0	0	0
	point14	14	905	30	19	30	9	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	425	25	9	25	4	25	0	0	0	0
	point37	37	425	25	9	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	651	25	13	25	7	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	902	25	19	25	9	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1457	25	30	25	15	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1648	25	34	25	17	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2438	30	50	30	25	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	3047	40	63	40	31	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	3097	40	64	40	32	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	88	25	2	25	1	25	0	0	0	0
	point32	32	88	25	2	25	1	25	0	0	0	0
	point33	33	88	25	2	25	1	25	0	0	0	0
	point34	34	88	25	2	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	1057	35	22	35	11	35	0	0	0	0
	point16	16	1057	35	22	35	11	35	0	0	0	0
	point17	17	1057	35	22	35	11	35	0	0	0	0
	point18	18	1057	35	22	35	11	35	0	0	0	0
	point19	19	1057	35	22	35	11	35	0	0	0	0
	point20	20	1057	35	22	35	11	35	0	0	0	0
	point21	21	1057	35	22	35	11	35	0	0	0	0
	point22	22	1057	35	22	35	11	35	0	0	0	0
	point23	23	1057	35	22	35	11	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	889	35	18	35	9	35	0	0	0	0
	point25	25	889	35	18	35	9	35	0	0	0	0
	point26	26	889	35	18	35	9	35	0	0	0	0
	point27	27	889	35	18	35	9	35	0	0	0	0
	point28	28	889	35	18	35	9	35	0	0	0	0
	point29	29	889	35	18	35	9	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1267	35	26	35	13	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field YR2030 PP SAT ARRVL										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field YR2030 PP SAT ARRVL																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg	Ht	Perturbs	On
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	



## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

INPUT: BARRIERS

10488

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

**10488**

C:\TNM25\Project Files\Sherbeck Field Fullerton College PN 10488\Yr2030PP Sat Arrival

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>											
<b>PROJECT/CONTRACT:</b>				10488							
<b>RUN:</b>				Sherbeck Field YR 2030 SAT DEPARTU							
<b>Roadway</b>				<b>Points</b>							
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>				<b>Segment</b>
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control</b>	<b>Speed</b>	<b>Percent</b>	<b>Pvmt</b>	<b>On</b>
							<b>Device</b>	<b>Constraint</b>	<b>Vehicles</b>	<b>Type</b>	<b>Struct?</b>
									<b>Affected</b>		
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field YR 2030 SAT DEPARTU											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	1990	30	41	30	21	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	626	30	13	30	6	30	0	0	0	0
	point12	12	626	30	13	30	6	30	0	0	0	0
	point13	13	626	30	13	30	6	30	0	0	0	0
	point14	14	626	30	13	30	6	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	425	25	9	25	4	25	0	0	0	0
	point37	37	425	25	9	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	572	25	12	25	6	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	762	25	16	25	8	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	930	25	19	25	10	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1198	25	25	25	12	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2033	30	42	30	21	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	2318	40	48	40	24	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	2515	40	52	40	26	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	96	25	2	25	1	25	0	0	0	0
	point32	32	96	25	2	25	1	25	0	0	0	0
	point33	33	96	25	2	25	1	25	0	0	0	0
	point34	34	96	25	2	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	561	35	12	35	6	35	0	0	0	0
	point16	16	561	35	12	35	6	35	0	0	0	0
	point17	17	561	35	12	35	6	35	0	0	0	0
	point18	18	561	35	12	35	6	35	0	0	0	0
	point19	19	561	35	12	35	6	35	0	0	0	0
	point20	20	561	35	12	35	6	35	0	0	0	0
	point21	21	561	35	12	35	6	35	0	0	0	0
	point22	22	561	35	12	35	6	35	0	0	0	0
	point23	23	561	35	12	35	6	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	404	35	8	35	4	35	0	0	0	0
	point25	25	404	35	8	35	4	35	0	0	0	0
	point26	26	404	35	8	35	4	35	0	0	0	0
	point27	27	404	35	8	35	4	35	0	0	0	0
	point28	28	404	35	8	35	4	35	0	0	0	0
	point29	29	404	35	8	35	4	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	327	35	7	35	3	35	0	0	0	0
	point31	31										

**INPUT: RECEIVERS**
**10488**

Dudek						9 July 2018					
MG						TNM 2.5					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field YR 2030 SAT DEPARTU										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y



## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field YR 2030 SAT DEPARTU																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft	#Up	#Dn	Reflec-tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

**INPUT: BARRIERS**
**10488**

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	0	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing	No Barrier						With Barrier			
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	63.6	66		63.6	10	----	63.6	0.0	8	-8.0
M2	2	1	0.0	63.8	66		63.8	10	----	63.8	0.0	8	-8.0
M3	3	1	0.0	63.6	66		63.6	10	----	63.6	0.0	8	-8.0
M4	4	1	0.0	51.9	66		51.9	10	----	51.9	0.0	8	-8.0
M5	5	1	0.0	58.7	66		58.7	10	----	58.7	0.0	8	-8.0
M6	6	1	0.0	64.1	66		64.1	10	----	64.1	0.0	8	-8.0
M7	7	1	0.0	56.1	66		56.1	10	----	56.1	0.0	8	-8.0
M8	8	1	0.0	53.8	66		53.8	10	----	53.8	0.0	8	-8.0
M9	9	1	0.0	64.7	66		64.7	10	----	64.7	0.0	8	-8.0
M10	10	1	0.0	63.0	66		63.0	10	----	63.0	0.0	8	-8.0
M11	11	1	0.0	66.6	66		66.6	10	Snd Lvl	66.6	0.0	8	-8.0
M12	12	1	0.0	62.4	66		62.4	10	----	62.4	0.0	8	-8.0
M13	13	1	0.0	60.3	66		60.3	10	----	60.3	0.0	8	-8.0
M14	14	1	0.0	66.3	66		66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		2	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

**INPUT: ROADWAYS**
**10488**

Dudek											
MG											
<b>INPUT: ROADWAYS</b>				<b>9 July 2018</b>							
<b>PROJECT/CONTRACT:</b>				<b>TNM 2.5</b>							
<b>RUN:</b>				<b>Sherbeck Field YR 2030 PP SAT DPRT</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>			
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>			<b>Segment</b>	
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
East Chapman Avenue - W of N Lemon	70.0	point1	1	507.0	2,656.6	170.00				Average	
		point3	3	1,568.4	2,669.0	170.00					
N Berkeley Avenue - W of N Lemon	50.0	point39	39	463.6	4,519.4	170.00				Average	
		point12	12	726.1	4,484.4	170.00				Average	
		point13	13	896.6	4,431.9	170.00				Average	
		point14	14	1,176.6	4,401.3	170.00				Average	
		point15	15	1,524.6	4,410.0	170.00					
N. Raymond Ave - N. of Chapman	40.0	point40	40	5,467.3	5,130.1	170.00				Average	
		point37	37	5,462.9	3,944.7	170.00				Average	
		point38	38	5,479.8	2,705.8	170.00					
North Lemon Street - N of N Berkeley	50.0	point43	43	1,513.3	5,134.2	170.00				Average	
		point8	8	1,530.8	4,421.2	170.00					
N. Raymond Ave N. - S. of Chapman	40.0	point46	46	5,479.8	2,701.8	170.00				Average	
		point2	2	5,487.4	1,544.1	170.00					
North Lemon Street - S of N Berkeley	50.0	point47	47	1,530.8	4,421.2	170.00				Average	
		point9	9	1,569.5	2,671.0	170.00					
North Lemon Street - S of E Chapman	50.0	point48	48	1,569.5	2,669.6	170.00				Average	
		point10	10	1,578.9	1,274.3	170.00					
East Chapman Avenue- Lemon to Berkel	70.0	point49	49	1,571.4	2,668.6	170.00				Average	
		point4	4	3,270.2	2,683.1	170.00					
East Chapman Avenue-Berkeley to Rym	70.0	point50	50	3,276.0	2,682.8	170.00				Average	
		point5	5	5,478.2	2,700.3	170.00					
East Chapman Avenue- E. of Rymnd	70.0	point51	51	5,486.1	2,700.3	170.00				Average	
		point6	6	6,296.1	2,717.7	170.00					
N Berkeley Avenue- S of Chapman Ave	50.0	point52	52	3,271.7	2,684.4	170.00				Average	

**INPUT: ROADWAYS**
**10488**

		point32	32	3,276.3	2,545.1	170.00				Average	
		point33	33	3,305.6	2,486.9	170.00				Average	
		point34	34	3,307.7	2,095.4	170.00				Average	
		point35	35	3,318.7	1,767.4	170.00					
N Berkeley Avenue-E of Lemon St	50.0	point53	53	1,535.2	4,410.0	170.00				Average	
		point16	16	1,885.1	4,414.4	170.00				Average	
		point17	17	2,010.1	4,433.5	170.00				Average	
		point18	18	2,185.4	4,518.6	170.00				Average	
		point19	19	2,254.8	4,577.6	170.00				Average	
		point20	20	2,343.4	4,627.9	170.00				Average	
		point21	21	2,449.2	4,678.2	170.00				Average	
		point22	22	2,591.6	4,697.3	170.00				Average	
		point23	23	2,766.9	4,697.3	170.00				Average	
		point24	24	2,940.5	4,681.7	170.00					
N Berkeley Avenue-E of Hornet Way	50.0	point54	54	2,940.5	4,681.7	170.00				Average	
		point25	25	3,048.1	4,614.0	170.00				Average	
		point26	26	3,169.6	4,499.4	170.00				Average	
		point27	27	3,223.4	4,391.8	170.00				Average	
		point28	28	3,251.5	4,276.8	170.00				Average	
		point29	29	3,259.8	4,006.5	170.00				Average	
		point30	30	3,256.4	3,732.2	170.00					
N Berkeley Avenue- N. of Chapman Ave	50.0	point55	55	3,256.4	3,732.2	170.00				Average	
		point31	31	3,271.7	2,686.5	170.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

Dudek												
MG												
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	10488											
RUN:	Sherbeck Field YR 2030 PP SAT DPRT											
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
East Chapman Avenue - W of N Lemon	point1	1	2428	30	50	30	25	30	0	0	0	0
	point3	3										
N Berkeley Avenue - W of N Lemon	point39	39	755	30	16	30	8	30	0	0	0	0
	point12	12	755	30	16	30	8	30	0	0	0	0
	point13	13	755	30	16	30	8	30	0	0	0	0
	point14	14	755	30	16	30	8	30	0	0	0	0
	point15	15										
N. Raymond Ave - N. of Chapman	point40	40	425	25	9	25	4	25	0	0	0	0
	point37	37	425	25	9	25	4	25	0	0	0	0
	point38	38										
North Lemon Street - N of N Berkeley	point43	43	572	25	12	25	6	25	0	0	0	0
	point8	8										
N. Raymond Ave N. - S. of Chapman	point46	46	924	25	19	25	10	25	0	0	0	0
	point2	2										
North Lemon Street - S of N Berkeley	point47	47	1449	25	30	25	15	25	0	0	0	0
	point9	9										
North Lemon Street - S of E Chapman	point48	48	1506	25	31	25	16	25	0	0	0	0
	point10	10										
East Chapman Avenue- Lemon to Berkel	point49	49	2454	30	51	30	25	30	0	0	0	0
	point4	4										
East Chapman Avenue-Berkeley to Rym	point50	50	3062	40	63	40	32	40	0	0	0	0
	point5	5										
East Chapman Avenue- E. of Rymnd	point51	51	3098	40	64	40	32	40	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**
**10488**

	point6	6										
N Berkeley Avenue- S of Chapman Ave	point52	52	96	25	2	25	1	25	0	0	0	0
	point32	32	96	25	2	25	1	25	0	0	0	0
	point33	33	96	25	2	25	1	25	0	0	0	0
	point34	34	96	25	2	25	1	25	0	0	0	0
	point35	35										
N Berkeley Avenue-E of Lemon St	point53	53	955	35	20	35	10	35	0	0	0	0
	point16	16	955	35	20	35	10	35	0	0	0	0
	point17	17	955	35	20	35	10	35	0	0	0	0
	point18	18	955	35	20	35	10	35	0	0	0	0
	point19	19	955	35	20	35	10	35	0	0	0	0
	point20	20	955	35	20	35	10	35	0	0	0	0
	point21	21	955	35	20	35	10	35	0	0	0	0
	point22	22	955	35	20	35	10	35	0	0	0	0
	point23	23	955	35	20	35	10	35	0	0	0	0
	point24	24										
N Berkeley Avenue-E of Horner Way	point54	54	802	35	17	35	8	35	0	0	0	0
	point25	25	802	35	17	35	8	35	0	0	0	0
	point26	26	802	35	17	35	8	35	0	0	0	0
	point27	27	802	35	17	35	8	35	0	0	0	0
	point28	28	802	35	17	35	8	35	0	0	0	0
	point29	29	802	35	17	35	8	35	0	0	0	0
	point30	30										
N Berkeley Avenue- N. of Chapman Ave	point55	55	1298	35	27	35	13	35	0	0	0	0
	point31	31										



**INPUT: RECEIVERS**
**10488**

Dudek											
MG											
INPUT: RECEIVERS											
PROJECT/CONTRACT:	10488										
RUN:	Sherbeck Field YR 2030 PP SAT DPRT										
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	1	1	3,283.9	3,788.2	170.00	5.00	0.00	66	10.0	8.0	Y
M2	2	1	3,218.4	4,459.0	170.00	5.00	0.00	66	10.0	8.0	Y
M3	3	1	3,299.5	2,878.9	170.00	5.00	0.00	66	10.0	8.0	Y
M4	4	1	2,096.6	4,776.4	170.00	5.00	0.00	66	10.0	8.0	Y
M5	5	1	1,572.4	4,832.0	170.00	5.00	0.00	66	10.0	8.0	Y
M6	6	1	1,503.2	4,487.0	170.00	5.00	0.00	66	10.0	8.0	Y
M7	7	1	600.7	4,386.9	170.00	5.00	0.00	66	10.0	8.0	Y
M8	8	1	3,276.9	1,995.3	170.00	5.00	0.00	66	10.0	8.0	Y
M9	9	1	1,774.3	2,600.4	170.00	5.00	0.00	66	10.0	8.0	Y
M10	10	1	1,535.3	1,662.3	170.00	5.00	0.00	66	10.0	8.0	Y
M11	11	1	5,310.2	2,793.7	170.00	5.00	0.00	66	10.0	8.0	Y
M12	12	1	5,528.8	2,959.0	170.00	5.00	0.00	66	10.0	8.0	Y
M13	13	1	5,421.3	2,344.5	170.00	5.00	0.00	66	10.0	8.0	Y
M14	14	1	1,000.9	2,709.7	170.00	5.00	0.00	66	10.0	8.0	Y

## INPUT: BARRIERS

10488

Dudek					9 July 2018														
MG					TNM 2.5														
INPUT: BARRIERS																			
PROJECT/CONTRACT:		10488																	
RUN:		Sherbeck Field YR 2030 PP SAT DPRT																	
Barrier										Points									
Name	Type	Height		If Wall	If Berm			Add'tnl		Name	No.	Coordinates	(bottom)	Height	Segment				
		Min	Max	\$ per Unit	\$ per Unit	Top Width	Run:Rise	\$ per Unit				X	Y	Z	at Point	Seg Ht	Perturbs	On	Important
				Area	Vol.			Length								Incre-	#Up	#Dn	Reflec-
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft				ft	ft	ft	ft	ft			tions?
Barrier1	W	0.00	99.99	0.00				0.00		point1	1	1,623.2	3,114.1	170.00	10.00	0.00	0	0	
										point3	3	1,777.5	3,114.1	170.00	10.00	0.00	0	0	
										point4	4	1,783.0	2,783.4	170.00	10.00	0.00	0	0	
										point5	5	1,642.5	2,780.7	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point114	114	896.7	3,756.1	170.00	10.00	0.00	0	0	
										point71	71	1,159.1	3,764.8	170.00	10.00	0.00	0	0	
										point72	72	1,172.2	3,379.9	170.00	10.00	0.00	0	0	
										point73	73	1,469.6	3,384.3	170.00	10.00	0.00	0	0	
										point74	74	1,491.5	3,152.5	170.00	10.00	0.00	0	0	
										point75	75	914.2	3,148.1	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point116	116	1,045.3	4,533.7	170.00	10.00	0.00	0	0	
										point66	66	682.1	4,599.0	170.00	10.00	0.00	0	0	
										point67	67	527.3	4,619.1	170.00	10.00	0.00	0	0	
										point68	68	527.3	5,035.2	170.00	10.00	0.00	0	0	
										point69	69	1,050.8	5,021.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point118	118	1,466.9	4,983.0	170.00	10.00	0.00	0	0	
										point62	62	1,470.9	4,511.1	170.00	10.00	0.00	0	0	
										point63	63	1,130.7	4,509.0	170.00	10.00	0.00	0	0	
										point64	64	1,106.0	4,972.0	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point120	120	1,635.8	4,734.6	170.00	10.00	0.00	0	0	
										point56	56	1,662.1	4,577.1	170.00	10.00	0.00	0	0	
										point57	57	1,845.8	4,616.5	170.00	10.00	0.00	0	0	
										point58	58	1,823.9	4,669.0	170.00	10.00	0.00	0	0	
										point59	59	1,697.1	4,642.7	170.00	10.00	0.00	0	0	
										point60	60	1,684.0	4,743.4	170.00	10.00				
Barrier1-2-2	W	0.00	99.99	0.00				0.00		point122	122	3,341.7	2,639.7	170.00	10.00	0.00	0	0	
										point44	44	3,936.5	2,639.7	170.00	10.00	0.00	0	0	
										point45	45	3,958.4	1,598.8	170.00	10.00	0.00	0	0	
										point46	46	3,385.4	1,594.4	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point124	124	1,912.2	2,575.0	170.00	10.00	0.00	0	0	
										point52	52	2,154.7	2,586.0	170.00	10.00	0.00	0	0	
										point53	53	2,160.2	2,453.8	170.00	10.00	0.00	0	0	
										point54	54	1,928.8	2,448.3	170.00	10.00				
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00		point126	126	2,678.0	4,164.2	170.00	10.00	0.00	0	0	
										point112	112	2,678.0	3,855.2	170.00	10.00	0.00	0	0	

## INPUT: BARRIERS

10488

									point102	102	3,184.9	3,865.6	170.00	10.00	0.00	0	0		
									point103	103	3,171.0	4,181.5	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point128	128	907.4	2,778.9	170.00	10.00	0.00	0	0		
									point105	105	1,487.2	2,785.9	170.00	10.00	0.00	0	0		
									point106	106	1,490.7	3,091.4	170.00	10.00	0.00	0	0		
									point107	107	914.4	3,105.3	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point130	130	2,277.4	2,046.9	170.00	10.00	0.00	0	0		
									point77	77	3,193.9	2,053.9	170.00	10.00	0.00	0	0		
									point78	78	3,235.5	1,928.9	170.00	10.00	0.00	0	0		
									point79	79	3,249.4	1,595.6	170.00	10.00	0.00	0	0		
									point80	80	2,319.0	1,616.4	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point132	132	1,629.3	2,370.8	170.00	10.00	0.00	0	0		
									point94	94	1,671.0	1,523.7	170.00	10.00	0.00	0	0		
									point95	95	2,198.6	1,530.6	170.00	10.00	0.00	0	0		
									point96	96	2,198.6	2,100.0	170.00	10.00	0.00	0	0		
									point97	97	2,025.1	2,100.0	170.00	10.00	0.00	0	0		
									point98	98	2,011.2	2,280.5	170.00	10.00	0.00	0	0		
									point99	99	1,740.4	2,259.7	170.00	10.00	0.00	0	0		
									point100	100	1,761.2	2,370.8	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point134	134	1,063.7	2,476.9	170.00	10.00	0.00	0	0		
									point109	109	1,511.5	2,480.4	170.00	10.00	0.00	0	0		
									point110	110	1,518.5	2,143.6	170.00	10.00	0.00	0	0		
									point111	111	973.4	2,133.2	170.00	10.00	0.00	0	0		
									point2	2	970.0	2,504.7	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point136	136	1,922.0	4,802.6	170.00	10.00	0.00	0	0		
									point37	37	2,883.6	4,750.5	170.00	10.00	0.00	0	0		
									point38	38	2,921.8	4,948.4	170.00	10.00	0.00	0	0		
									point39	39	1,821.3	4,910.2	170.00	10.00	0.00	0	0		
									point40	40	1,831.7	4,820.0	170.00	10.00	0.00	0	0		
									point41	41	1,911.6	4,823.4	170.00	10.00	0.00	0	0		
									point42	42	1,915.0	4,795.7	170.00	10.00					
Barrier1-2	W	0.00	99.99	0.00				0.00	point137	137	3,012.1	4,726.3	170.00	10.00	0.00	0	0		
									point138	138	3,213.4	4,590.9	170.00	10.00	0.00	0	0		
									point33	33	3,605.7	4,604.7	170.00	10.00	0.00	0	0		
									point34	34	3,612.6	4,809.6	170.00	10.00	0.00	0	0		
									point35	35	3,025.9	4,799.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point140	140	3,321.1	3,676.8	170.00	10.00	0.00	0	0		
									point19	19	3,399.2	3,675.1	170.00	10.00	0.00	0	0		
									point20	20	3,411.3	4,225.3	170.00	10.00	0.00	0	0		
									point21	21	3,491.2	4,348.6	170.00	10.00	0.00	0	0		
									point22	22	3,486.0	4,534.3	170.00	10.00	0.00	0	0		
									point23	23	3,253.4	4,527.4	170.00	10.00	0.00	0	0		
									point24	24	3,322.8	4,254.8	170.00	10.00	0.00	0	0		
									point25	25	3,321.2	3,685.3	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point141	141	3,531.7	2,743.1	170.00	10.00	0.00	0	0		
									point30	30	3,328.9	2,732.6	170.00	10.00					
Barrier1-2-2-2	W	0.00	99.99	0.00				0.00	point143	143	3,324.4	3,592.2	170.00	10.00	0.00	0	0		
									point26	26	3,406.7	3,590.1	170.00	10.00	0.00	0	0		
									point27	27	3,420.6	3,031.2	170.00	10.00	0.00	0	0		

**INPUT: BARRIERS**
**10488**

									point28	28	3,517.8	2,920.1	170.00	10.00	0.00	0	0		
									point29	29	3,531.7	2,743.1	170.00	10.00					
Barrier1-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point145	145	5,401.8	4,352.1	170.00	10.00	0.00	0	0		
									point82	82	5,401.8	3,012.0	170.00	10.00	0.00	0	0		
									point83	83	4,915.8	2,963.4	170.00	10.00	0.00	0	0		
									point84	84	4,915.8	2,741.3	170.00	10.00	0.00	0	0		
									point85	85	3,596.6	2,741.3	170.00	10.00	0.00	0	0		
									point86	86	3,575.8	4,442.3	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point147	147	2,367.1	3,783.6	170.00	10.00	0.00	0	0		
									point15	15	2,375.4	2,805.5	170.00	10.00	0.00	0	0		
									point16	16	2,639.9	2,813.7	170.00	10.00	0.00	0	0		
									point17	17	2,642.7	3,778.1	170.00	10.00					
Barrier1-2-2	W	0.00	99.99	0.00				0.00	point149	149	1,840.8	3,690.0	170.00	10.00	0.00	0	0		
									point7	7	2,143.9	3,684.5	170.00	10.00	0.00	0	0		
									point8	8	2,207.3	3,706.5	170.00	10.00	0.00	0	0		
									point9	9	2,265.2	3,712.0	170.00	10.00	0.00	0	0		
									point10	10	2,259.7	3,601.8	170.00	10.00	0.00	1	0		
									point11	11	2,334.0	3,599.0	170.00	10.00	0.00	0	0		
									point12	12	2,339.6	2,736.6	170.00	10.00	0.00	0	0		
									point13	13	1,860.1	2,736.6	170.00	10.00					
Barrier1-2-2-2-2-2-2-2-2	W	0.00	99.99	0.00				0.00	point151	151	4,020.1	2,623.2	170.00	10.00	0.00	0	0		
									point88	88	5,422.6	2,644.0	170.00	10.00	0.00	0	0		
									point89	89	5,415.7	2,192.7	170.00	10.00	0.00	0	0		
									point90	90	5,019.9	2,192.7	170.00	10.00	0.00	0	0		
									point91	91	5,033.8	1,602.6	170.00	10.00	0.00	0	0		
									point92	92	4,068.7	1,602.6	170.00	10.00					
Barrier1-2-2-2-2	W	0.00	99.99	0.00				0.00	point153	153	3,218.3	2,619.1	170.00	10.00	0.00	0	0		
									point48	48	2,347.6	2,575.0	170.00	10.00	0.00	0	0		
									point49	49	2,358.6	2,150.7	170.00	10.00	0.00	0	0		
									point50	50	3,251.4	2,145.2	170.00	10.00					

## RESULTS: SOUND LEVELS

10488

Dudek MG													
RESULTS: SOUND LEVELS PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type	Calculated	Noise Reduction			
				Calculated	Crit'n		Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
			dBA	dBA	dBA		dB	dB		dBA	dB	dB	dB
M1	1	1	0.0	67.1	66		67.1	10	Snd Lvl	67.1	0.0	8	-8.0
M2	2	1	0.0	66.9	66		66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M3	3	1	0.0	68.6	66		68.6	10	Snd Lvl	68.6	0.0	8	-8.0
M4	4	1	0.0	54.2	66		54.2	10	----	54.2	0.0	8	-8.0
M5	5	1	0.0	58.9	66		58.9	10	----	58.9	0.0	8	-8.0
M6	6	1	0.0	64.8	66		64.8	10	----	64.8	0.0	8	-8.0
M7	7	1	0.0	57.0	66		57.0	10	----	57.0	0.0	8	-8.0
M8	8	1	0.0	54.3	66		54.3	10	----	54.3	0.0	8	-8.0
M9	9	1	0.0	65.5	66		65.5	10	----	65.5	0.0	8	-8.0
M10	10	1	0.0	64.0	66		64.0	10	----	64.0	0.0	8	-8.0
M11	11	1	0.0	67.7	66		67.7	10	Snd Lvl	67.7	0.0	8	-8.0
M12	12	1	0.0	63.1	66		63.1	10	----	63.1	0.0	8	-8.0
M13	13	1	0.0	61.2	66		61.2	10	----	61.2	0.0	8	-8.0
M14	14	1	0.0	67.1	66		67.1	10	Snd Lvl	67.1	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		14	0.0	0.0	0.0								
All Impacted		5	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

APPENDIX **E-4**  
*Construction Noise Barrier*  
*Calculations*



Project: Sherbeck Field EIR - Noise

3/15/2019

By: MG

Please Enter: Using English (E) units or Metric (M) units ? E

Ray Trace Number/Description	Source- Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground (ft. or m)	Receiver Base Elev. (ft. or m)	Receiver Height above Ground (ft. or m)	Horizontal Barrier Dist. (in ref. to source) (ft. or m)	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source- Rcvr Straight- Line Dist. (ft. or m)	Source- Top-of- Barrier Dist. (ft. or m)	Receiver- Top-of- Barrier Dist. (ft. or m)	Lambda	N <sub>max</sub>	AE <sub>(barriers)</sub> (dB)
1. Source -Construction Equipment	100.0	168.0	7.0	166.0	5.0	15.0	168.0	<b>8.0</b>	500.0	100.1	15.0	85.1	2.3	0.1	<b>6.4</b>
2. Source -Construction Equipment	200.0	168.0	7.0	166.0	5.0	115.0	168.0	<b>8.0</b>	500.0	200.0	115.0	85.1	2.3	0.1	<b>6.6</b>
2. Source -Construction Equipment	300.0	168.0	7.0	166.0	5.0	215.0	168.0	<b>8.0</b>	500.0	300.0	215.0	85.1	2.3	0.1	<b>6.7</b>





# **APPENDIX F**

## ***Traffic Impact Analysis***



TRAFFIC IMPACT ANALYSIS REPORT  
FULLERTON COLLEGE SHERBECK FIELD  
IMPROVEMENTS PROJECT

Fullerton, California  
April 17, 2019

Prepared for:

**DUDEK**  
605 Third Street  
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LLG Ref. 2-17-3897-1



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# TABLE OF CONTENTS

SECTION	PAGE
<b>1.0 Introduction.....</b>	<b>1</b>
1.1 Scope of Work .....	1
1.2 Study Area .....	2
<b>2.0 Project Description .....</b>	<b>4</b>
2.1 Site Access .....	5
2.2 Pedestrian Circulation .....	5
<b>3.0 Existing Conditions.....</b>	<b>6</b>
3.1 Existing Street System .....	6
3.2 Existing Bicycle Network .....	6
3.3 Existing Public Transit.....	7
3.4 Existing Traffic Volumes.....	7
3.5 Existing Daily Roadway Segment Volume Comparisons .....	8
3.6 Existing Intersection Conditions.....	8
3.6.1 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Signalized Intersections).....	8
3.6.2 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections).....	9
3.6.2.1 Two-Way Stop-Controlled Intersections .....	9
3.6.2.2 All-Way Stop-Controlled Intersections .....	9
3.7 Level of Service Criteria .....	9
3.8 Level of Service Input Parameters .....	10
3.9 Existing Level of Service Results .....	10
<b>4.0 Traffic Forecasting Methodology .....</b>	<b>17</b>
<b>5.0 Project Traffic Characteristics .....</b>	<b>18</b>
5.1 Project Traffic Generation – Academic Instruction.....	18
5.2 Project Traffic Generation – Field Event.....	18
5.3 Project Traffic Distribution and Assignment.....	19
5.4 Existing Plus Project Traffic Conditions .....	20
<b>6.0 Future Traffic Conditions .....</b>	<b>23</b>
6.1 Year 2020 Traffic Volumes .....	23
6.2 Year 2030 Buildout Traffic Volumes .....	24
<b>7.0 Traffic Impact Analysis Methodology .....</b>	<b>25</b>
7.1 Significant Impact Criteria.....	25
7.2 Traffic Impact Analysis Scenarios.....	26

## TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
<b>8.0 Peak Hour Intersection Capacity Analysis.....</b>	<b>27</b>
8.1 Existing Plus Project Analysis – Weekday Academic Instruction .....	27
8.2 Existing Plus Project Analysis – Field Event .....	27
8.3 Year 2020 Traffic Conditions – Weekday Academic Instruction .....	28
8.3.1 Year 2020 Traffic Conditions (Without Proj.) – Weekday Academic Instruction ...	28
8.3.2 Year 2020 Plus Project Traffic Conditions – Weekday Academic Instruction .....	29
8.4 Year 2020 Traffic Conditions – Saturday Field Event .....	29
8.4.1 Year 2020 Traffic Conditions (Without Project) – Saturday Field Event .....	29
8.4.2 Year 2020 Plus Project Traffic Conditions – Saturday Field Event .....	30
8.5 Year 2030 Traffic Conditions – Weekday Academic Instruction .....	30
8.5.1 Year 2030 Buildout Traffic Conditions (Without Project) – Weekday Academic Instruction .....	30
8.5.2 Year 2030 Buildout Plus Project Traffic Conditions – Weekday Academic Instruction .....	31
8.6 Year 2030 Traffic Conditions – Saturday Field Event .....	31
8.6.1 Year 2030 Buildout Traffic Conditions (Without Proj.) – Saturday Field Event .....	31
8.6.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event .....	32
<b>9.0 State of California (Caltrans) Methodology .....</b>	<b>55</b>
9.1 Existing Plus Project Traffic Conditions – Weekday Academic Instruction.....	55
9.1.1 Existing Traffic Conditions – Weekday Academic Instruction.....	55
9.1.2 Existing Plus Project Traffic Conditions – Weekday Academic Instruction.....	55
9.2 Existing Plus Project Traffic Conditions – Saturday Field Event.....	56
9.2.1 Existing Traffic Conditions – Saturday Field Event.....	56
9.2.2 Existing Plus Project Traffic Conditions – Saturday Field Event.....	56
9.3 Year 2020 Traffic Conditions – Weekday Academic Instruction .....	56
9.3.1 Year 2020 Traffic Conditions (Without Project) – Weekday Academic Instruction	56
9.3.2 Year 2020 Plus Project Traffic Conditions – Weekday Academic Instruction .....	57
9.4 Year 2020 Traffic Conditions – Saturday Field Event .....	57
9.4.1 Year 2020 Traffic Conditions (Without Project) – Saturday Field Event .....	57
9.4.2 Year 2020 Plus Project Traffic Conditions – Saturday Field Event .....	57
9.5 Year 2030 Traffic Conditions – Weekday Academic Instruction .....	58
9.5.1 Year 2030 Buildout Traffic Conditions (Without Project) – Weekday Academic Instruction .....	58
9.5.2 Year 2030 Buildout Plus Project Traffic Conditions – Weekday Academic Instruction .....	58
9.6 Year 2030 Traffic Conditions – Saturday Field Event .....	58
9.6.1 Year 2030 Buildout Traffic Conditions (Without Proj.) – Saturday Field Event .....	58
9.6.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event .....	59
9.7 Off-Ramp Queuing Analysis .....	66
9.7.1 Existing Plus Project Traffic Conditions .....	66
9.7.2 Year 2020 Cumulative Plus Project Traffic Conditions .....	66

## TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
9.7.3 Year 2030 Buildout Plus Project Traffic Conditions.....	67
<b>10.0 Caltrans Facilities Analysis.....</b>	<b>74</b>
10.1 Basic Freeway Segment Capacity Analysis.....	75
10.1.1 Existing Traffic Conditions.....	75
10.2 Existing Plus Project Traffic Conditions – Saturday Field Event.....	76
10.3 Year 2020 Cum. Plus Proj. Basic Freeway Segment Capacity Analysis – Saturday Field Event.....	80
10.3.1 Year 2020 Cumulative Traffic Conditions – Saturday Field Event.....	80
10.3.2 Year 2020 Cum. Plus Project Traffic Conditions – Saturday Field Event .....	80
10.4 Year 2030 Buildout Plus Project Basic Freeway Segment Capacity Analysis – Saturday Field Event.....	82
10.4.1 Year 2030 Buildout Traffic Conditions – Saturday Field Event .....	82
10.4.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event ....	82
10.5 Freeway Segment Traffic Improvements.....	83
10.6 Freeway Merge/Diverge Ramp Junction Analysis – Saturday Field Event .....	85
10.6.1 Existing Plus Project Ramp Junction Analysis – Saturday Field Event .....	85
10.6.1.1 Existing Traffic Conditions – Saturday Field Event .....	85
10.6.1.2 Existing Plus Project Traffic Conditions – Saturday Field Event.....	85
10.6.2 Year 2020 Cumulative Ramp Junction Analysis – Saturday Field Event .....	87
10.6.2.1 Year 2020 Cumulative Traffic Conditions – Saturday Field Event .....	87
10.6.2.2 Year 2020 Cumulative Plus Project Traffic Conditions – Saturday Field Event	87
10.6.3 Year 2030 Buildout Ramp Junction Analysis – Saturday Field Event.....	89
10.6.3.1 Year 2030 Buildout Traffic Conditions – Saturday Field Event.....	89
10.6.3.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event ...	89
10.6.4 Freeway Ramp Junction Traffic Improvements .....	89
<b>11.0 Area-Wide Traffic Improvements.....</b>	<b>91</b>
11.1 Existing Plus Project Recommended Improvements.....	91
11.1.1 Weekday Academic Instruction.....	91
11.1.2 Saturday Field Event.....	91
11.2 Year 2020 Plus Project Recommended Improvements .....	92
11.2.1 Weekday Academic Instruction.....	92
11.2.2 Saturday Field Event.....	92
11.3 Year 2030 Buildout Plus Project Recommended Improvements .....	92
11.3.1 Weekday Academic Instruction.....	92
11.3.2 Saturday Field Event.....	93
11.4 Existing Plus Project Recommended Improvements – Caltrans Methodology .....	93
11.4.1 Weekday Academic Instruction.....	93
11.4.2 Saturday Field Event.....	94
11.5 Year 2020 Plus Project Recommended Improvements – Caltrans Methodology.....	94
11.5.1 Weekday Academic Instruction.....	94

## TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
11.5.2 Saturday Field Event.....	94
11.6 Year 2030 Buildout Plus Proj. Recommended Improvements – Caltrans Methodology ...	94
11.6.1 Weekday Academic Instruction.....	94
11.6.2 Saturday Field Event.....	94
11.7 Traffic Management Plan .....	95
11.8 Project-Related Fair Share Percentage Contribution .....	96
11.8.1 Year 2020 Project-Related Fair Share Contribution .....	96
11.8.2 Year 2030 Buildout Project-Related Fair Share Contribution.....	96
<b>12.0 Friday Field Event Analysis.....</b>	<b>98</b>
12.1 Existing Friday Traffic Volumes .....	98
12.2 Project Traffic Generation and Assignment – Friday Field Event .....	98
12.3 Existing Plus Project Friday Traffic Volumes .....	98
12.4 Year 2020 Friday Traffic Volumes.....	99
12.5 Peak Hour Intersection Capacity Analysis .....	99
12.5.1 Existing Plus Project Analysis – Friday Field Event.....	99
12.5.2 Year 2020 Traffic Conditions – Friday Field Event .....	100
12.5.2.1 Year 2020 Traffic Conditions (Without Project) – Friday Field Event .....	100
12.5.2.2 Year 2020 Plus Project Traffic Conditions – Friday Field Event .....	100
12.6 Existing Plus Project Friday Recommended Improvements .....	109
12.7 Year 2020 Plus Project Friday Recommended Improvements .....	109
12.8 Traffic Management Plan .....	110
<b>13.0 Construction Traffic Impact Assessment .....</b>	<b>112</b>
13.1 Construction Traffic Trip Generation .....	112
13.2 Construction Traffic Assessment.....	113
13.3 Construction Management Plan Criteria.....	114
<b>14.0 Summary Of Findings And Conclusions .....</b>	<b>116</b>



## APPENDICES

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### APPENDIX

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- A. Existing Traffic Count Data
- B. Existing Traffic Conditions Intersection Level of Service Calculation Worksheets
- C. Yorba Linda High School Traffic Counts – Fullerton College Football Game
- D. Cumulative Project Traffic Volumes
- E. Existing Plus Project Traffic Conditions Intersection Level of Service Calculation Worksheets
- F. Year 2020 Cumulative Traffic Conditions Intersection Level of Service Calculation Worksheets
- G. Year 2030 Buildout Traffic Conditions Intersection Level of Service Calculation Worksheets
- H. Existing Plus Project Traffic Conditions Caltrans Intersection Level of Service Calculation Worksheets
- I. Year 2020 Cumulative Traffic Conditions Caltrans Intersection Level of Service Calculation Worksheets
- J. Year 2030 Buildout Traffic Conditions Caltrans Intersection Level of Service Calculation Worksheets
- K. Basic Freeway Segment Analysis
- L. Merge/Diverge Analysis
- M. Existing Traffic Count Data (Friday Field Event Project Analysis)
- N. Existing Plus Project Traffic Conditions Intersection Level of Service Calculation Worksheets (Friday Field Event Project Analysis)
- O. Year 2020 Cumulative Traffic Conditions Intersection Level of Service Calculation Worksheets (Friday Field Event Project Analysis)

## LIST OF FIGURES

SECTION—FIGURE #	FOLLOWING PAGE
1-1 Vicinity Map.....	3
2-1 Existing Site Aerial .....	5
2-2 Proposed Site Plan.....	5
3-1 Existing Roadway Conditions and Intersection Controls.....	8
3-2 Roadway Classifications.....	8
3-3 Bikeways Network.....	8
3-4 OCTA Bus System Map .....	8
3-5 Existing Weekday PM Peak Hour Traffic Volumes.....	8
3-6 Existing Saturday Event Arrival Period Peak Hour Traffic Volumes .....	8
3-7 Existing Saturday Event Departure Period Peak Hour Traffic Volumes .....	8
3-8 Existing Daily Profile for Berkeley Avenue East of Lemon Street .....	8
3-9 Existing Daily Profile for Hornet Way North of Berkeley Avenue.....	8
3-10 Existing Daily Profile for Brookdale Place East of Berkeley Avenue .....	8
3-11 Existing Daily Profile for Lemon Street North of Chapman Avenue.....	8
3-12 Existing Daily Profile for Chapman Avenue between Lemon Street and Berkeley Avenue.....	8
3-13 Existing Daily Profile for Berkeley Avenue North of Chapman Avenue .....	8
3-14 Existing Hourly Profile for Berkeley Avenue East of Lemon Street .....	8
3-15 Existing Hourly Profile for Hornet Way North of Berkeley Avenue .....	8
3-16 Existing Hourly Profile for Brookdale Place East of Berkeley Avenue.....	8
3-17 Existing Hourly Profile for Lemon Street North of Chapman Avenue .....	8
3-18 Existing Hourly Profile for Chapman Avenue between Lemon Street and Berkeley Avenue.....	8
3-19 Existing Hourly Profile for Berkeley Avenue North of Chapman Avenue .....	8
5-1 Year 2020 Project Traffic Distribution Pattern – Academic Instruction .....	22
5-2 Year 2030 Project Traffic Distribution Pattern – Academic Instruction .....	22
5-3 Year 2020 Project Traffic Distribution Pattern – Saturday Field Event .....	22
5-4 Year 2030 Project Traffic Distribution Pattern – Saturday Field Event .....	22
5-5 Year 2020 Weekday PM Peak Hour Project Traffic Volumes.....	22
5-6 Year 2030 Weekday PM Peak Hour Project Traffic Volumes.....	22
5-7 Year 2020 Saturday Event Arrival Period Peak Hour Project Traffic Volumes .....	22

## LIST OF FIGURES (CONTINUED)

SECTION—FIGURE #	FOLLOWING PAGE
5-8	Year 2020 Saturday Event Departure Period Peak Hour Project Traffic Volumes ...22
5-9	Year 2030 Saturday Event Arrival Period Peak Hour Project Traffic Volumes .....22
5-10	Year 2030 Saturday Event Departure Period Peak Hour Project Traffic Volumes ...22
5-11	Existing Plus Project Weekday PM Peak Hour Traffic Volumes.....22
5-12	Existing Plus Project Saturday Event Arrival Period Peak Hour Traffic Volumes...22
5-13	Existing Plus Project Saturday Event Departure Period Peak Hour Traffic Volumes .....22
6-1	Year 2020 Weekday PM Peak Hour Cumulative Project Traffic Volumes.....24
6-2	Year 2020 Saturday Event Arrival Period and Event Departure Period Peak Hour Cumulative Project Traffic Volumes .....24
6-3	Year 2020 Weekday Cumulative PM Peak Hour Traffic Volumes.....24
6-4	Year 2020 Saturday Event Arrival Period Cumulative Peak Hour Traffic Volumes .....24
6-5	Year 2020 Saturday Event Departure Period Cumulative Peak Hour Traffic Volumes .....24
6-6	Year 2020 Weekday Cumulative Plus Project PM Peak Hour Traffic Volumes.....24
6-7	Year 2020 Saturday Event Arrival Period Cumulative Plus Project Peak Hour Traffic Volumes .....24
6-8	Year 2020 Saturday Event Departure Period Cumulative Plus Project Peak Hour Traffic Volumes .....24
6-9	Year 2030 Weekday PM Peak Hour Cumulative Project Traffic Volumes.....24
6-10	Year 2030 Saturday Event Arrival Period and Event Departure Period Peak Hour Cumulative Project Traffic Volumes .....24
6-11	Year 2030 Weekday Buildout PM Peak Hour Traffic Volumes.....24
6-12	Year 2030 Saturday Event Arrival Period Buildout Traffic Volumes.....24
6-13	Year 2030 Saturday Event Departure Period Buildout Traffic Volumes .....24
6-14	Year 2030 Weekday Buildout Plus Project PM Peak Hour Traffic Volumes .....24
6-15	Year 2030 Saturday Event Arrival Period Buildout Plus Project Peak Hour Traffic Volumes .....24
6-16	Year 2030 Saturday Event Departure Period Buildout Plus Project Peak Hour Traffic Volumes .....24

## LIST OF FIGURES (CONTINUED)

SECTION—FIGURE #	FOLLOWING PAGE
11-1 Existing Plus Project Saturday Recommended Improvements.....	95
11-2 Year 2020 Saturday Recommended Improvements .....	95
11-3 Year 2030 Saturday Recommended Improvements .....	95
11-4 Year 2030 Caltrans Recommended Improvements .....	95
11-5 Traffic Management Plan Details Saturday Field Event Arrival Period.....	95
11-6 Traffic Management Plan Details Saturday Field Event Departure Period.....	95
12-1 Existing Friday Event Arrival Period Peak Hour Traffic Volumes .....	98
12-2 Existing Friday Event Departure Period Peak Hour Traffic Volumes .....	98
12-3 Existing Plus Project Friday Event Arrival Period Peak Hour Traffic Volumes.....	98
12-4 Existing Plus Project Friday Event Departure Period Peak Hour Traffic Volumes ..	98
12-5 Year 2020 Friday Event Arrival Period Cumulative Peak Hour Traffic Volumes .....	99
12-6 Year 2020 Friday Event Departure Period Cumulative Peak Hour Traffic Volumes .....	99
12-7 Year 2020 Friday Event Arrival Period Cumulative Plus Project Peak Hour Traffic Volumes .....	99
12-8 Year 2020 Friday Event Departure Period Cumulative Plus Project Peak Hour Traffic Volumes .....	99
12-9 Existing Plus Project Friday Recommended Improvements .....	111
12-10 Year 2020 Friday Recommended Improvements .....	111
12-11 Traffic Management Plan Details Friday Field Event Departure Period.....	111

## LIST OF TABLES

SECTION—TABLE #	PAGE
3-1	Level of Service Criteria For Signalized Intersections..... 11
3-2	Level of Service Criteria For Unsignalized Intersections ..... 12
3-3	Existing Weekday Peak Hour Intersection Capacity Analysis ..... 13-14
3-4	Existing Saturday Peak Hour Intersection Capacity Analysis ..... 15-16
5-1	Weekday Academic Instruction Project Traffic Generation Forecast ..... 21
5-2	Saturday Field Event Project Traffic Generation Forecast ..... 22
8-1	Existing Plus Project Weekday Peak Hour Intersection Capacity Analysis – Academic Instruction..... 33-35
8-2	Existing Plus Project Saturday Peak Hour Intersection Capacity Analysis – Field Event..... 36-38
8-3	Year 2020 Weekday Peak Hour Intersection Capacity Analysis – Academic Instruction..... 39-42
8-4	Year 2020 Saturday Peak Hour Intersection Capacity Analysis – Field Event..... 43-46
8-5	Year 2030 Buildout Weekday Peak Hour Intersection Capacity Analysis – Academic Instruction..... 47-50
8-6	Year 2030 Buildout Saturday Peak Hour Intersection Capacity Analysis – Field Event..... 51-54
9-1	Existing Plus Project Weekday Peak Hour Intersection Capacity Analysis (Caltrans) – Academic Instruction..... 60
9-2	Existing Plus Project Saturday Peak Hour Intersection Capacity Analysis (Caltrans) – Field Event..... 61
9-3	Year 2020 Weekday Peak Hour Intersection Capacity Analysis (Caltrans) – Academic Instruction..... 62
9-4	Year 2020 Saturday Peak Hour Intersection Capacity Analysis (Caltrans) – Field Event..... 63
9-5	Year 2030 Buildout Weekday Peak Hour Intersection Capacity Analysis (Caltrans) – Academic Instruction..... 64
9-6	Year 2030 Buildout Saturday Peak Hour Intersection Capacity Analysis (Caltrans) – Field Event..... 65

## LIST OF TABLES (CONTINUED)

SECTION—TABLE #	PAGE
9-7	Existing Plus Project Weekday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Academic Instruction ..... 68
9-8	Existing Plus Project Saturday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Field Event ..... 69
9-9	Year 2020 Cumulative Weekday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Academic Instruction ..... 70
9-10	Year 2020 Cumulative Saturday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Field Event ..... 71
9-11	Year 2030 Buildout Weekday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Academic Instruction ..... 72
9-12	Year 2030 Buildout Saturday Peak Hour
	Freeway Off-Ramp Queuing Analysis – Field Event ..... 73
10-1	Existing Weekday Peak Hour
	Freeway Mainline Capacity Analysis Summary – Academic Instruction ..... 77
10-2	Existing Saturday Peak Hour
	Freeway Mainline Capacity Analysis Summary – Field Event ..... 78
10-3	Existing Plus Project Saturday Peak Hour
	Freeway Mainline Capacity Analysis Summary – Field Event ..... 79
10-4	Year 2020 Cumulative Saturday Peak Hour
	Freeway Mainline Capacity Analysis Summary – Field Event ..... 81
10-5	Year 2030 Buildout Saturday Peak Hour
	Freeway Mainline Capacity Analysis Summary – Field Event ..... 84
10-6	Existing Plus Project Saturday Peak Hour
	Merge and Diverge Capacity Analysis Summary – Field Event ..... 86
10-7	Year 2020 Cumulative Saturday Peak Hour
	Merge and Diverge Capacity Analysis Summary – Field Event ..... 88
10-8	Year 2030 Buildout Saturday Peak Hour
	Merge and Diverge Capacity Analysis Summary – Field Event ..... 90
11-1	Year 2030 Buildout Project Fair Share Contribution ..... 97

## LIST OF TABLES (CONTINUED)

SECTION—TABLE #	PAGE
12-1 Existing Plus Project Friday Peak Hour	
Intersection Capacity Analysis – Field Event.....	102-104
12-2 Year 2020 Cumulative Friday Peak Hour	
Intersection Capacity Analysis – Field Event.....	105-108
13-1 Project Construction-Related Traffic Generation Forecast .....	115

# TRAFFIC IMPACT ANALYSIS REPORT

## FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT

Fullerton, California  
April 17, 2019

### 1.0 INTRODUCTION

This Traffic Impact Analysis report addresses the potential traffic impacts associated with the proposed Fullerton College Sherbeck Field Improvements Project (hereinafter referred to as Project). The Fullerton College Campus is an approximately 70-acre site that is generally bounded by residential uses along Berkeley Avenue to the north and east, Chapman Avenue to the south, Lemon Street to the west, and has an address of 321 E. Chapman Avenue, in the City of Fullerton, California. Specifically, Sherbeck Field (i.e. the proposed Project site) is located in the northeastern portion of the Fullerton College Campus. The proposed Project will consist of the installation of permanent prefabricated aluminum bleachers with 4,417 seats (i.e. 2,861 seats on the home side of the field and 1,556 seats on the visitor side of the field), six field lighting stanchions to allow for more evening class options for the physical education program, a sound system, a press box and a storage building. The proposed field improvements will also enable Fullerton College home football games to occur on campus between 1:00 PM and 4:00 PM on Saturdays.

### 1.1 Scope of Work

This traffic report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts associated with the proposed Project. The traffic analysis evaluates the operating conditions at thirty-one (31) key study locations within the project vicinity, estimates the trip generation potential of the proposed Project, superimposes the project-related traffic volumes on the circulation system as it currently exists, and forecasts future operating conditions without and with the proposed Project. Where necessary, intersection improvements/mitigation measures are identified.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing weekday PM peak hour traffic information has been collected at thirty-one (31) key study locations on a “typical” weekday for use in the preparation of intersection level of service calculations. A “typical” weekday constitutes a Tuesday, Wednesday or Thursday and refers to a non-holiday condition when the college and other local schools are in session. Existing Saturday peak hour traffic information has also been collected at the thirty-one (31) key study intersections for use in the preparation of Saturday intersection level of service calculations.

This traffic report satisfies the traffic impact requirements of the City of Fullerton and is consistent with the most current *Congestion Management Program (CMP) for Orange County*. This traffic report analyzes existing and future weekday PM peak hour and Saturday peak hour traffic conditions for the Year 2020 traffic setting (i.e. project completion year) and for the Year 2030 Buildout traffic setting. Year 2020 weekday PM peak hour and Saturday peak hour background traffic volumes were forecast based on application of growth rates provided by the City of Fullerton to existing



traffic volumes, and further adding traffic volumes from identified cumulative projects. Year 2030 weekday PM peak hour and Saturday peak hour background traffic volumes were also forecast based on application of growth rates provided by the City of Fullerton to existing traffic volumes, and further adding traffic volumes from all future cumulative projects (i.e. buildout of the City).

## 1.2 Study Area

The traffic analysis study area is generally comprised of those locations which have the greatest potential to experience significant traffic impacts due to the proposed project as defined by the Lead Agency. Consistent with standard traffic engineering practices, the study area typically includes those intersections that are:

- arterial to arterial intersections adjacent or in close proximity to the project site;
- arterial to arterial intersections in the vicinity of the project site that are documented to have current or projected future adverse operational issues; and
- arterial to arterial intersections in the vicinity of the project site that are forecast to experience a relatively greater percentage of project-related vehicular turning movements.

Based on the above criteria and direction from City of Fullerton Traffic Engineering staff, a total of thirty-one (31) locations have been selected for evaluation. The thirty-one (31) locations listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic impact investigation.

### Key Study Intersections

- |   |  |
|---|--|
| 1. Harbor Boulevard at Bastanchury Road         | 17. Lemon Street at Commonwealth Avenue                  |
| 2. Harbor Boulevard at Valley View Dr/Brea Blvd | 18. Harbor Boulevard at Valencia Drive                   |
| 3. Harbor Boulevard at Berkeley Avenue          | 19. Lemon Street at Valencia Drive                       |
| 4. Lemon Street at Berkeley Avenue              | 20. Harbor Boulevard at Orangethorpe Avenue <sup>1</sup> |
| 5. Hornet Way at Berkeley Avenue                | 21. Lemon Street at Orangethorpe Avenue                  |
| 6. Euclid Street at Malvern Avenue              | 22. Harbor Boulevard at SR-91 WB Ramps <sup>1</sup>      |
| 7. Harbor Boulevard at Chapman Avenue           | 23. Lemon Street at SR-91 WB Ramps                       |
| 8. Lemon Street at Chapman Avenue               | 24. Harbor Boulevard at SR-91 EB Ramps <sup>1</sup>      |
| 9. Berkeley Avenue at Chapman Avenue            | 25. Lemon Street at SR-91 EB Ramps                       |
| 10. Raymond Avenue at Chapman Avenue            | 26. Centennial Way at Berkeley Avenue                    |
| 11. Acacia Avenue at Chapman Avenue             | 27. Lemon Street at Fullerton College Drive              |
| 12. State College Boulevard at Chapman Avenue   | 28. Berkeley Avenue at College Driveway No. 1            |
| 13. SR-57 SB Ramps at Chapman Avenue            | 29. Berkeley Avenue at College Driveway No. 2            |
| 14. SR-57 NB Ramps at Chapman Avenue            | 30. Berkeley Avenue at Brookdale Place                   |
| 15. Lemon Street at Wilshire Avenue             | 31. Lemon Street at Parking Structure                    |
| 16. Harbor Boulevard at Commonwealth Avenue     |  |

**Figure 1-1** presents a Vicinity Map, which illustrates the general location of the Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area

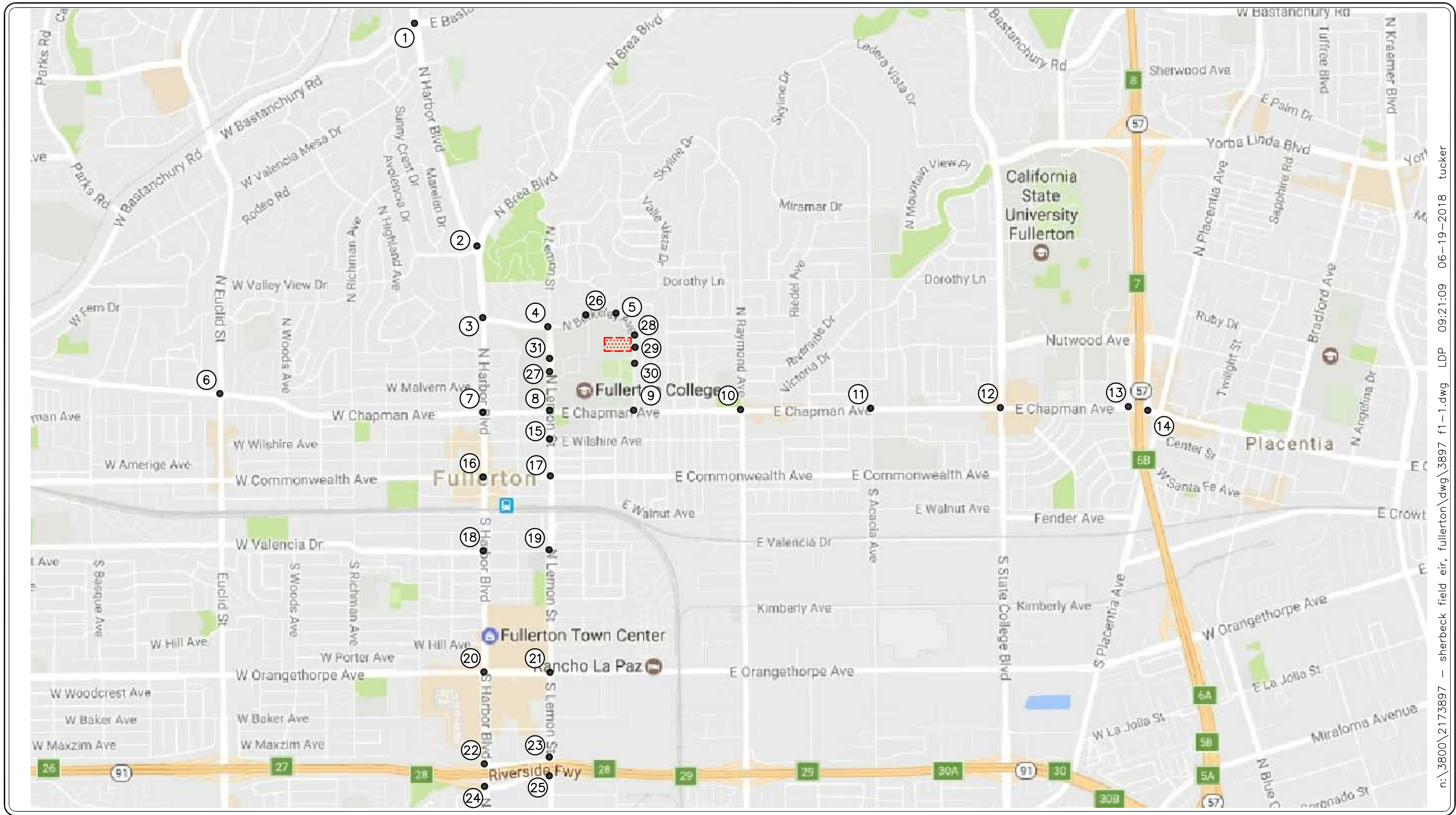
<sup>1</sup> Orange County Congestion Management Program (CMP) intersection.

growth, cumulative projects, and the proposed Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service, and/or mitigate the impact of the project.

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated Project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour capacity analyses for Existing conditions,
- Weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour capacity analyses for Existing plus Project conditions,
- Weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour capacity analyses for Year 2020 traffic conditions without and with the proposed Project,
- Weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour capacity analyses for Year 2030 Buildout traffic conditions without and with the proposed Project,
- Caltrans Facilities Analysis at applicable locations,
- Recommended Improvements, and
- Friday Field Event analysis.

It should be noted that since the proposed Project consists of field lighting to allow for more weekday evening class options for the physical education program (i.e. beginning at 6:00 PM) and is not changing the field's current operations that occur during the morning hours, this traffic study does not include the evaluation of the weekday AM peak hour.



n:\3800\2173897 - sherbeck field air, fullerton\dwg\3897 f1-1.dwg LDP 09:21:09 06-19-2018 tucker



NO SCALE

SOURCE: GOOGLE

KEY

- # = STUDY INTERSECTION
- [Red hatched rectangle] = PROJECT SITE

FIGURE 1-1

VICINITY MAP

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON

## 2.0 PROJECT DESCRIPTION

The Fullerton College Campus is an approximately 70-acre site that is generally bounded by residential uses along Berkeley Avenue to the north and east, Chapman Avenue to the south, Lemon Street to the west, and has an address of 321 E. Chapman Avenue, in the City of Fullerton, California. Specifically, Sherbeck Field (i.e. the proposed Project site) is located in the northeastern portion of the Fullerton College Campus. Sherbeck Field is 4.36 acres and consists of a turf football field that is surrounded by a 400-meter-long track. A two-story field house is located on the western edge of the field and there is a scoreboard located at the eastern end of the field. Sherbeck Field currently does not have permanent seating or lighting. Sherbeck Field is currently used for academic instruction, competitive athletics, and rentals. **Figure 2-1** presents an aerial depiction of the existing site.

**Figure 2-2** presents the proposed site plan for the proposed Project. As shown, the proposed Project will consist of the installation of permanent prefabricated aluminum bleachers with 4,417 seats (i.e. 2,861 seats on the home side of the field and 1,556 seats on the visitor side of the field), six field lighting stanchions to allow for more evening class options for the physical education program, a sound system, a press box and a storage building. The proposed field improvements will also allow Fullerton College home football games to occur on campus between 1:00 PM and 4:00 PM on Saturdays. The proposed Project is expected to be completed by the Year 2020.

In order to facilitate the development of trip generation forecasts for the proposed Project, the aforementioned project description has been divided amongst two categories. These two categories consist of 1) academic instruction and 2) field event. The following describes the aforementioned two categories in detail.

### **Academic Instruction**

As stated above, the addition of lighting stanchions to Sherbeck Field will allow the college to offer more evening class options for the physical education program. Based on the Proposed Sherbeck Field Schedule and Programming table provided by Fullerton College Staff, new evening classes would begin at 6:00 PM. A maximum of two classes would occur on the field with class sizes ranging from 24 students to 32 students. To provide a conservative analysis, the traffic study assumes that each class will have the maximum number of students (i.e. 32 students) and all of the students would arrive during the PM peak hour.

### **Field Event**

As stated above, the proposed Project will consist of the installation of permanent prefabricated aluminum bleachers with 4,417 seats. The proposed field improvements will also allow Fullerton College home football games to occur on campus between 1:00 PM and 4:00 PM on Saturdays. To provide a conservative analysis, the traffic study assumes a Saturday field event with a maximum seating attendance of 4,417 seats. It should be noted that there would be approximately five regular season football games and up to two playoff football games per year at the field.

## **2.1 Site Access**

Vehicular access to the parking lots adjacent to Sherbeck Field (i.e. student parking lots 4, 5 and 6) would continue to be provided from the existing unsignalized driveways located along Berkeley Avenue [i.e. Centennial Way/Berkeley Avenue (key study intersection #26), Berkeley Avenue/College Driveway No. 1 (key study intersection #28) and Berkeley Avenue/College Driveway No. 2 (key study intersection #29)].

It should be noted that key study intersection #29 (i.e. Berkeley Avenue/College Driveway No. 2) was assumed to only provide egress movements from the campus in the Year 2030, consistent with the Fullerton College Master Plan Traffic Study.

## **2.2 Pedestrian Circulation**

Pedestrian circulation would continue to be provided via the existing public sidewalks located along Berkeley Avenue within the vicinity of Sherbeck Field, which connect to the existing driveways along Berkeley Avenue and to the campus internal walkways.





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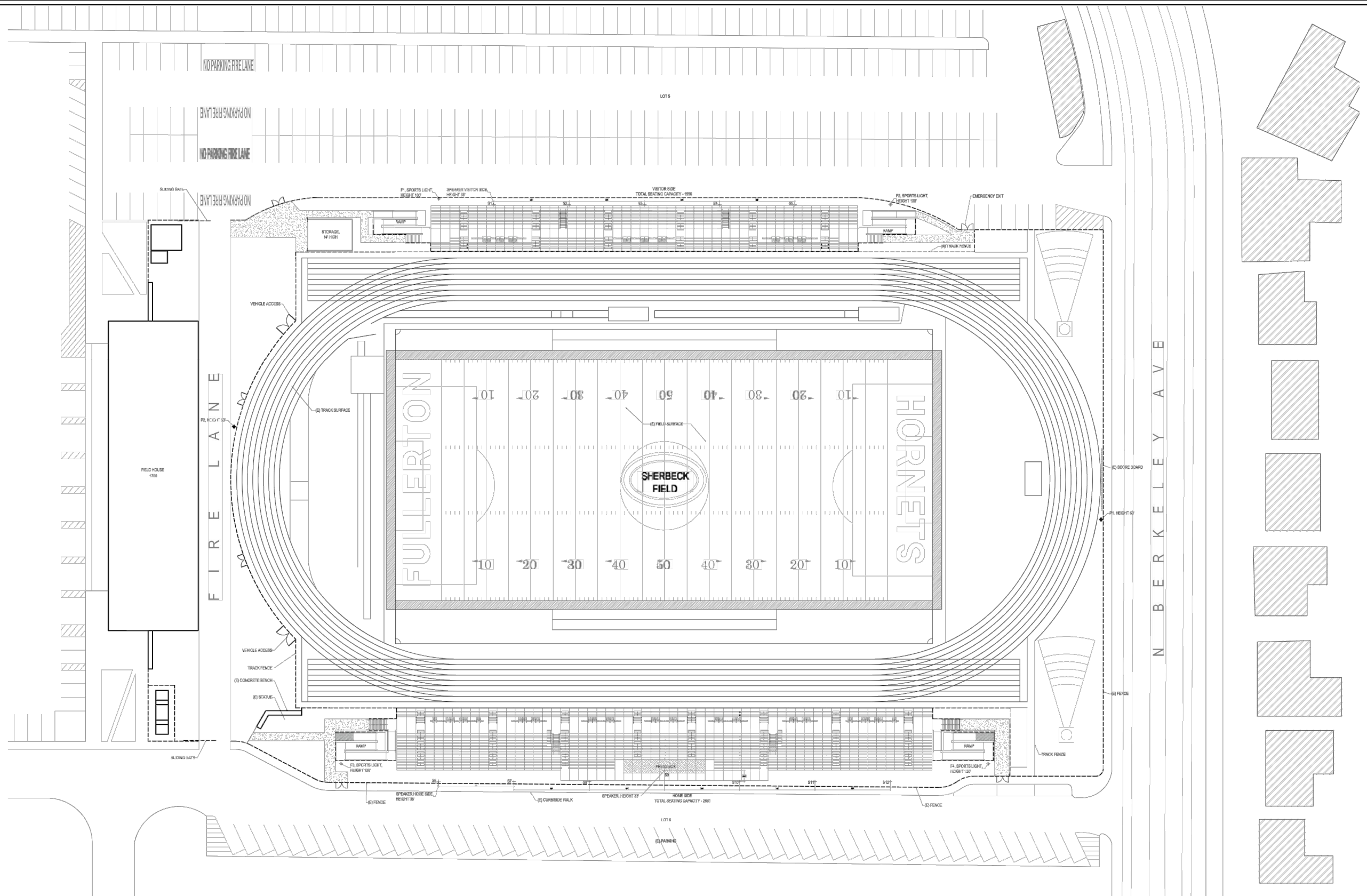
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FIGURE 2-1

EXISTING SITE AERIAL

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





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FIGURE 2-2

PROPOSED SITE PLAN

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



NO SCALE

## 3.0 EXISTING CONDITIONS

### 3.1 Existing Street System

The principal local network of streets serving the project site are Berkeley Avenue, Lemon Street and Chapman Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

**Berkeley Avenue** is generally a two-lane, divided roadway, oriented in both the east-west and north-south directions. The posted speed limit on Berkeley Avenue is 35 miles per hour (mph). On-street parking is generally permitted along this roadway in the vicinity of Fullerton College. Traffic signals control the study intersections of Berkeley Avenue at Harbor Boulevard, Lemon Street, Horner Way and Chapman Avenue. The study intersections of Berkeley Avenue at Centennial Way, College Driveway No. 1, College Driveway No. 2 and Brookdale Place are stop controlled.

**Lemon Street** is a two-lane, undivided roadway north of Berkeley Avenue and a four-lane, divided roadway south of Berkeley Avenue, oriented in the north-south direction. The posted speed limit on Lemon Street is 25 mph north of Berkeley Avenue, 30 mph between Berkeley Avenue and Chapman Avenue, and 40 mph south of Chapman Avenue. On-street parking is generally not permitted along this roadway in the vicinity of Fullerton College. Traffic signals control the study intersections of Lemon Street at Berkeley Avenue, Fullerton College Drive, Chapman Avenue, Wilshire Avenue, Commonwealth Avenue, Valencia Drive, Orangethorpe Avenue, SR-91 Westbound Ramps, and SR-91 Eastbound Ramps.

**Chapman Avenue** is generally a four-lane, divided roadway oriented in the east-west direction. The posted speed limit on Chapman Avenue is 40 mph between Euclid Street and Harbor Boulevard, 30 mph between Harbor Boulevard and Raymond Avenue, and 40 mph east of Raymond Avenue. On-street parking is generally not permitted along this roadway in the vicinity of Fullerton College, except on the south side of the street between Lawrence Avenue and Balcom Avenue. Traffic signals control the study intersections of Chapman Avenue at Euclid Street, Harbor Boulevard, Lemon Street, Berkeley Avenue, Raymond Avenue, Acacia Avenue, State College Boulevard, SR-57 Southbound Ramps, and SR-57 Northbound Ramps.

**Figure 3-1** presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections. **Figure 3-2** shows roadway classifications within the City of Fullerton as shown on the City's General Plan Circulation Element.

### 3.2 Existing Bicycle Network

The City of Fullerton promotes bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bicycle Master Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The Existing Bikeways



Network is shown on **Figure 3-3**. As shown in *Figure 3-3*, a Class II bike lane is currently provided along Berkeley Avenue in both directions between Chapman Avenue and Lemon Street.

### 3.3 Existing Public Transit

Public transit bus service is provided in the Project area by the Orange County Transportation Authority (OCTA). The OCTA Bus System Map is shown in **Figure 3-4**. Four (4) OCTA Bus Routes operate within the vicinity of the Project site either along Chapman Avenue or Lemon Street and consist of the following:

- OCTA Bus Route 24
- OCTA Express Bus Route 103B
- OCTA Bus Route 143
- OCTA Bus Route 213/A

Five (5) bus stops are located along Lemon Street between Berkeley Avenue and Wilshire Avenue, west of the college campus. Four (4) bus stops are located along Chapman Avenue between Lemon Street and Berkeley Avenue, south of the college campus.

### 3.4 Existing Traffic Volumes

Thirty-one (31) key study intersections have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections and their analysis will reveal the expected relative impacts of the project. Existing weekday PM peak hour traffic volumes for the locations evaluated in this report were obtained from the *Fullerton College Master Plan Traffic Impact Analysis Report*, prepared by LLG Engineers, dated May 24, 2017. It should be noted that all weekday PM peak hour traffic counts taken from the *Fullerton College Master Plan Traffic Impact Analysis Report* were factored up by the City-approved growth factor of 0.5% to bring them up to current Year 2017 existing baseline traffic conditions. The only exception was key study intersection #1, as the traffic count for this location was conducted in March 2017.

Existing Saturday Event Arrival Period and Saturday Event Departure Period peak hour traffic volumes for the locations evaluated in this report were obtained from manual peak hour turning movement counts conducted by Transportation Studies Inc. in November 2017. It should be noted that the Saturday traffic counts were conducted between 12:00 PM and 2:00 PM and between 3:30 PM and 5:30 PM.

**Figure 3-5** illustrates the existing weekday PM peak hour traffic volumes at the key study intersections evaluated in this report. **Figures 3-6** and **3-7** illustrate the existing Saturday Event Arrival Period and existing Saturday Event Departure Period peak hour traffic volumes at the key study intersections evaluated in this report, respectively. **Appendix A** contains the detailed peak hour count sheets for the key intersections evaluated in this report.

### 3.5 Existing Daily Roadway Segment Volume Comparisons

Five days of daily (24-hour) traffic counts were collected from Friday October 6, 2017 through Tuesday October 10, 2017 at six (6) locations either bordering or near the Fullerton College campus. The six (6) locations consisted of the following:

- Berkeley Avenue, east of Lemon Street
- Hornet Way, north of Berkeley Avenue
- Brookdale Place, east of Berkeley Avenue
- Lemon Street, north of Chapman Avenue
- Chapman Avenue, between Lemon Street and Berkeley Avenue
- Berkeley Avenue, north of Chapman Avenue

The traffic counts were conducted to gain insight as to the existing variation in daily weekday versus daily weekend traffic around the Fullerton College campus. **Figures 3-8, 3-9, 3-10, 3-11, 3-12 and 3-13** present the existing daily profile for the six (6) locations listed above, respectively. Review of the aforementioned figures indicates that traffic around the Fullerton College campus is significantly lower on a typical Saturday when compared to a typical weekday (Tuesday had the greatest daily volume). The Saturday traffic volumes are approximately fifty percent (50%) lower at all the locations, except for the segment on Brookdale Place (approximately 35% lower) and Chapman Avenue (approximately 25% lower).

**Figures 3-14, 3-15, 3-16, 3-17, 3-18 and 3-19** present the Saturday versus Tuesday existing hourly volume profiles for the six (6) locations listed above, respectively. Review of the aforementioned figures indicates again that traffic around the Fullerton College campus is significantly lower on a Saturday when compared to a Tuesday on an hourly basis. These results would imply that there is significant roadway capacity in the area to add special event traffic on Saturdays.

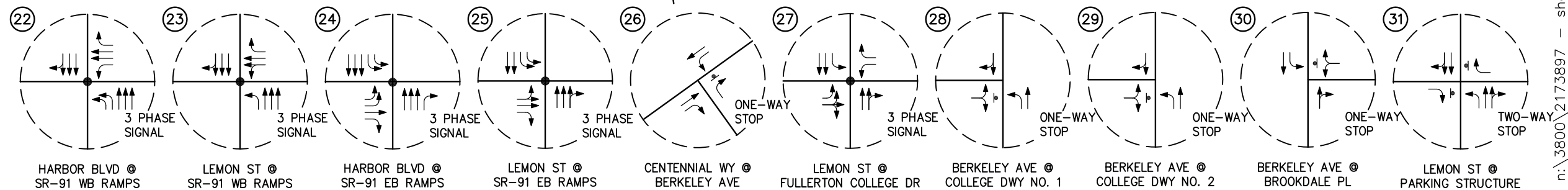
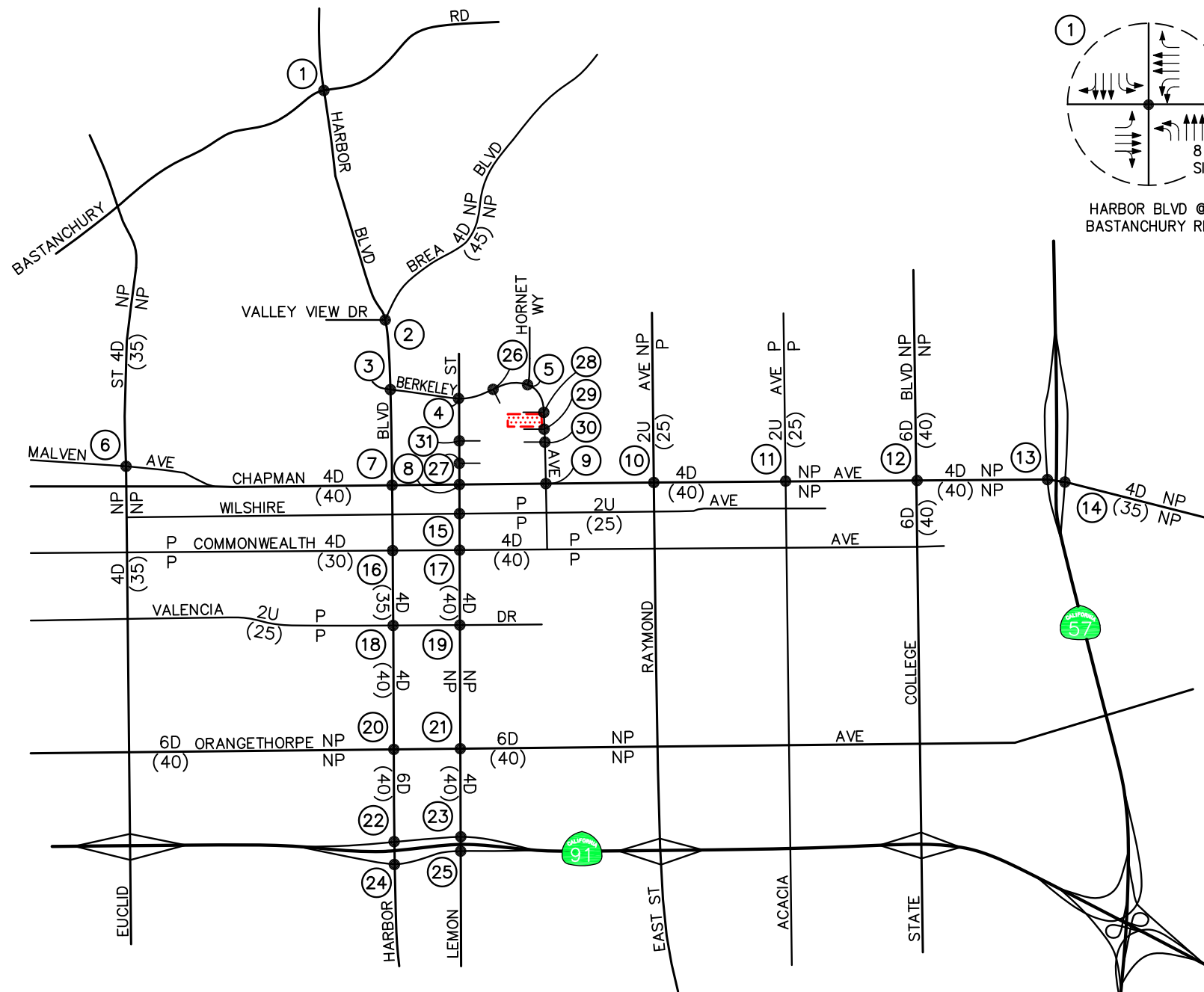
*Appendix A* also contains the daily traffic volumes for the aforementioned six (6) roadway segments.

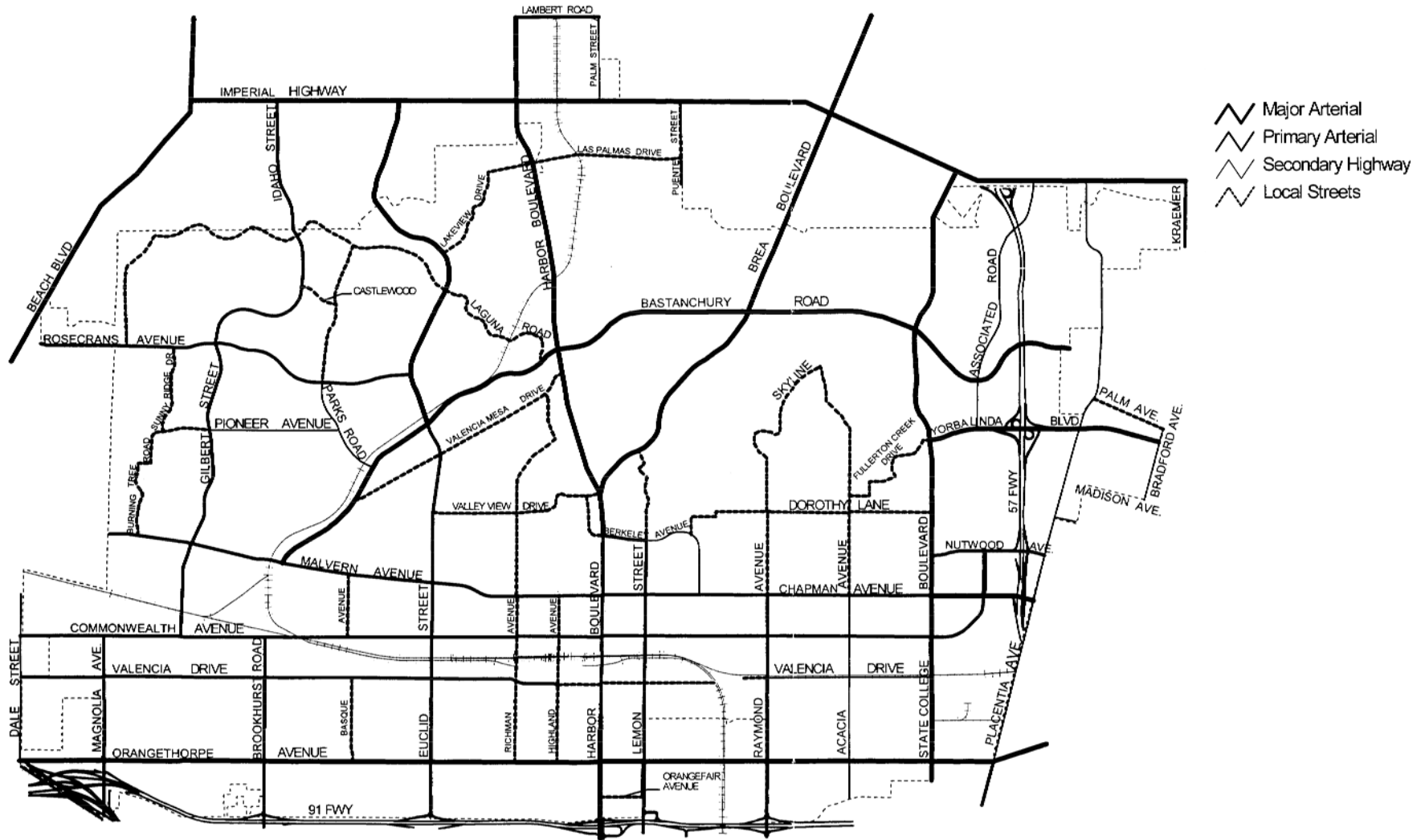
### 3.6 Existing Intersection Conditions

In conformance with City of Fullerton requirements, existing peak hour operating conditions for the key study intersections were evaluated using the methodology outlined in *Chapter 19 of the Highway Capacity Manual 6 (HCM 6)* for signalized intersections, the methodology outlined in *Chapter 20 of the HCM 6* for two-way stop-controlled intersections and the methodology outlined in *Chapter 21 of the HCM 6* for all-way stop-controlled intersections.

#### 3.6.1 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Signalized Intersections)

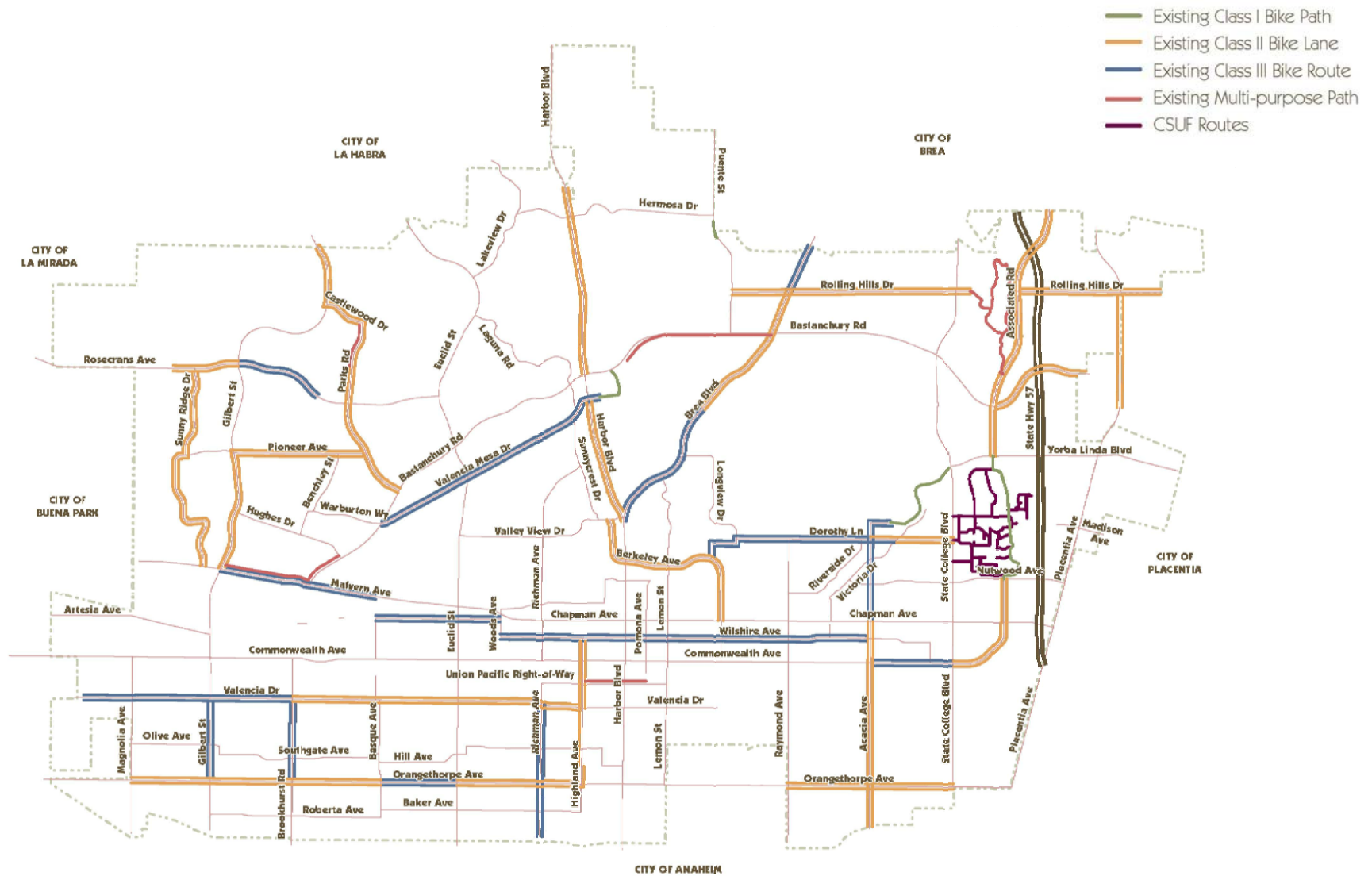
Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort, and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the



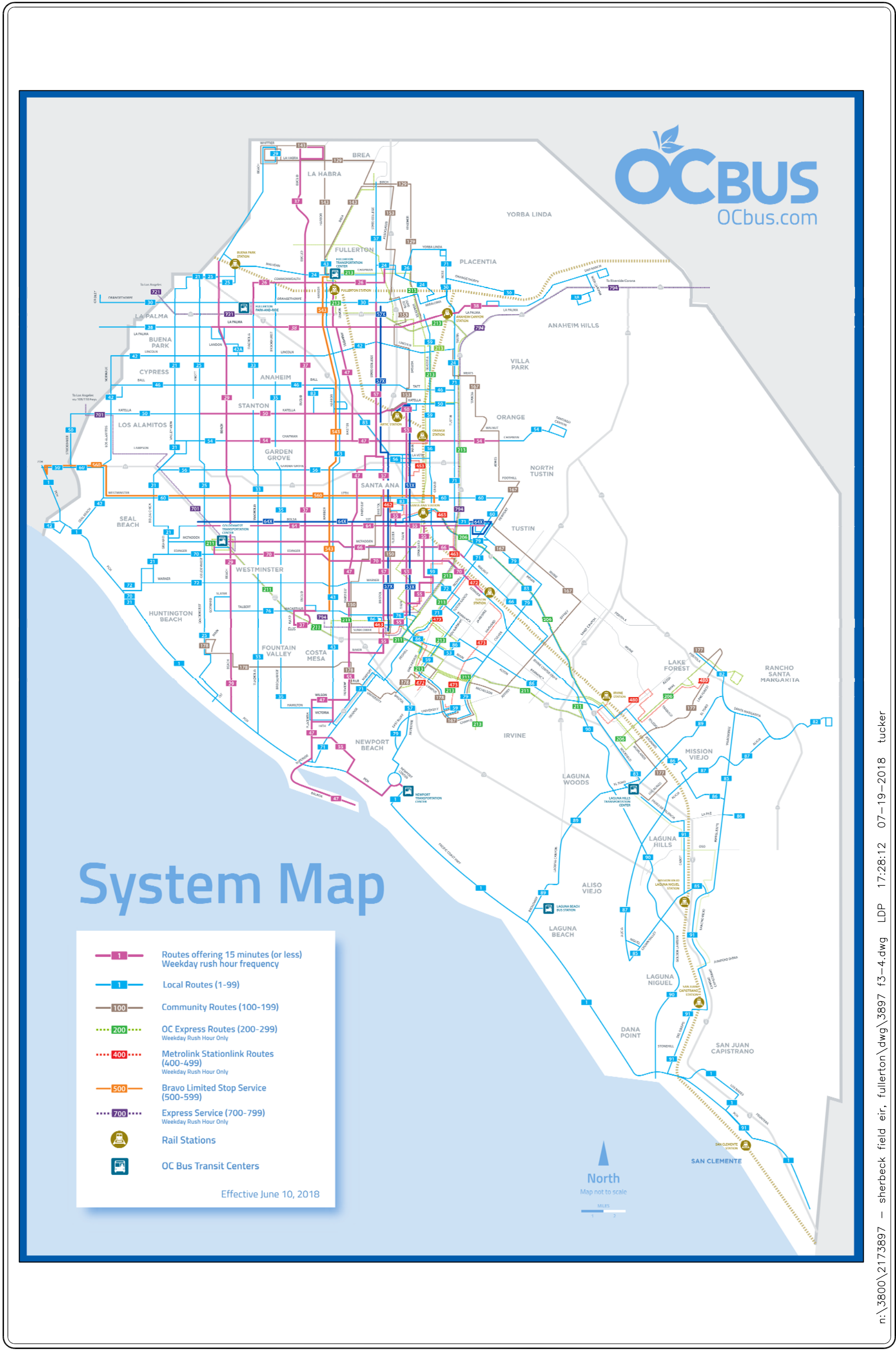


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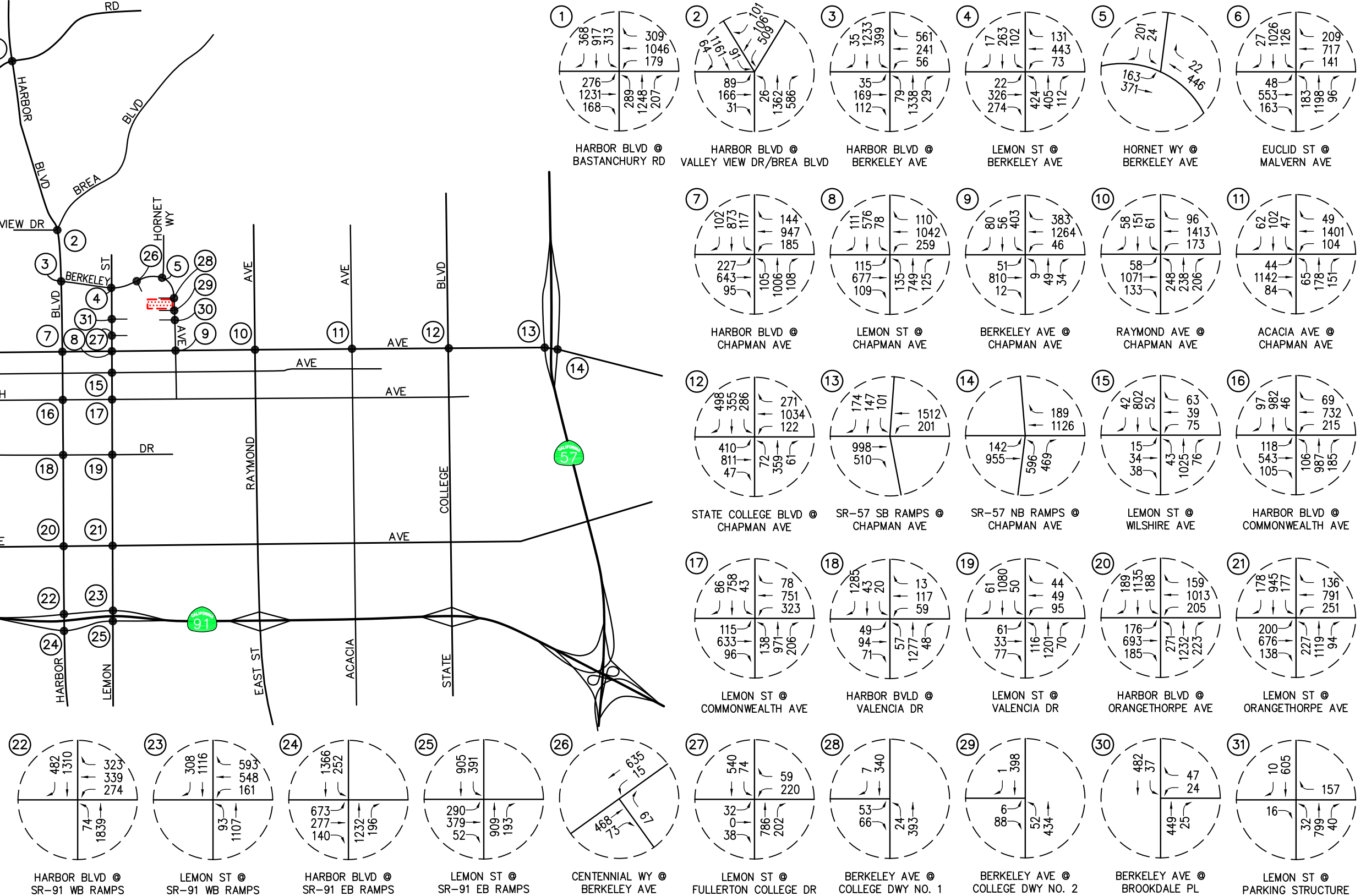
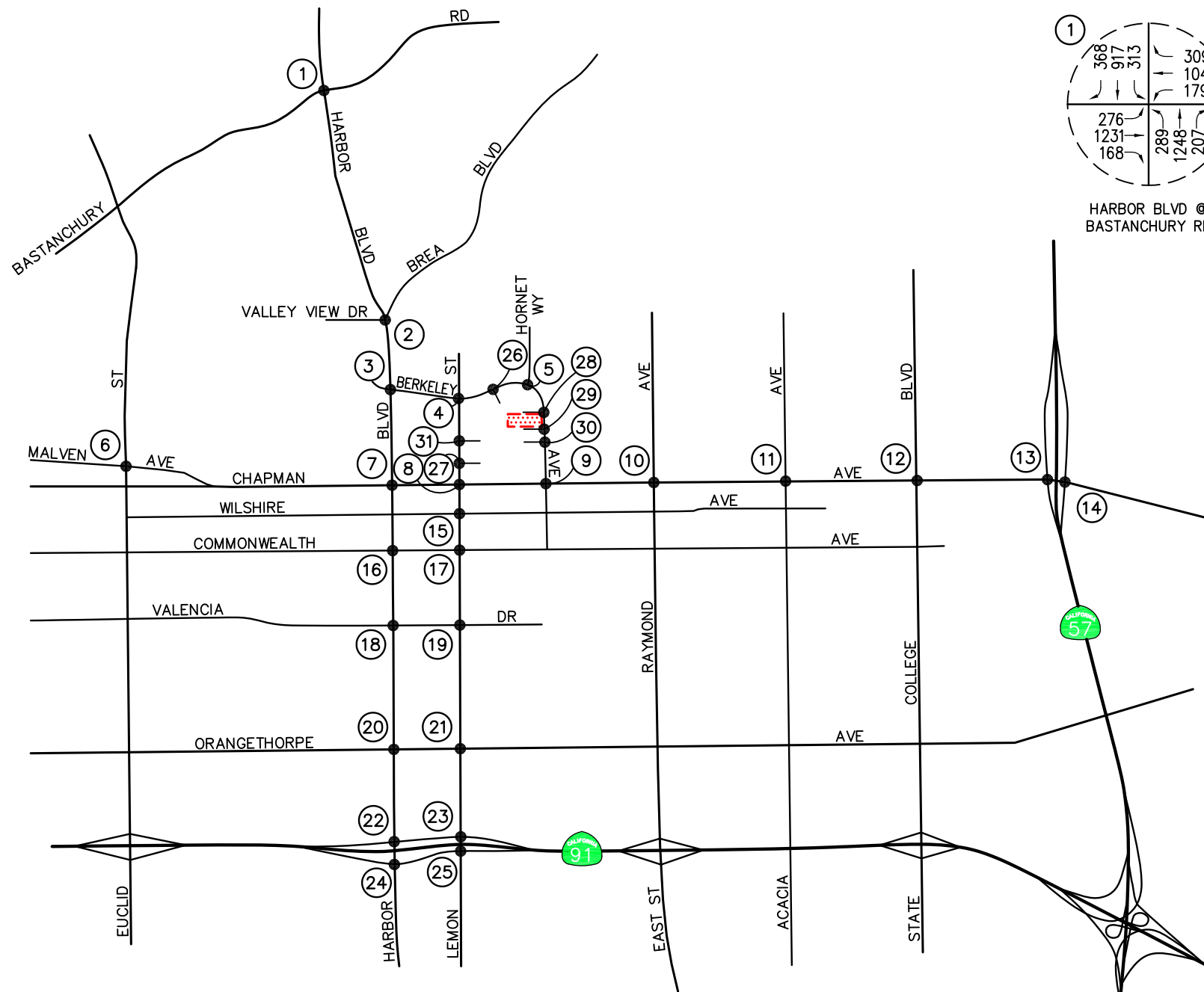


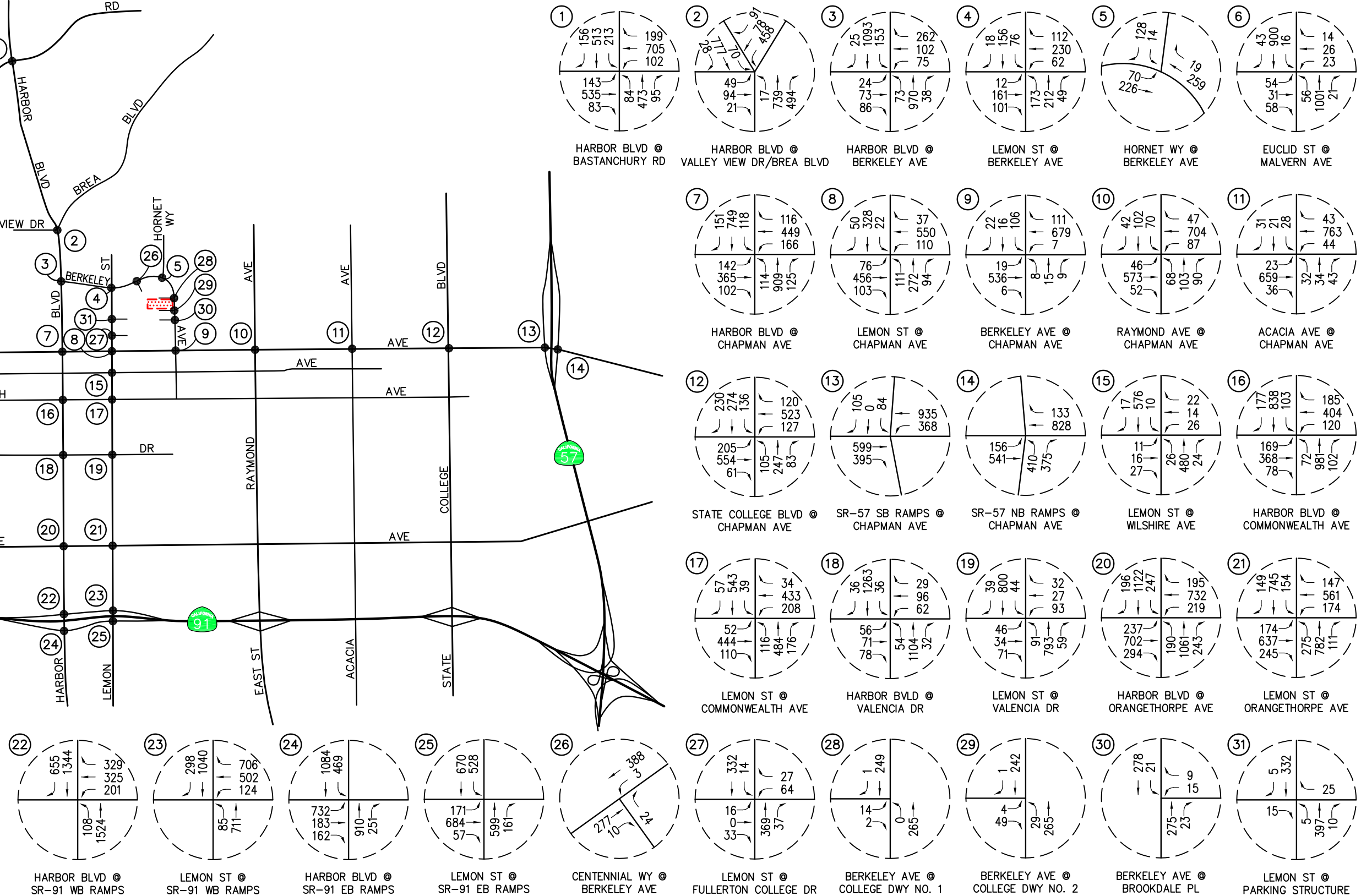
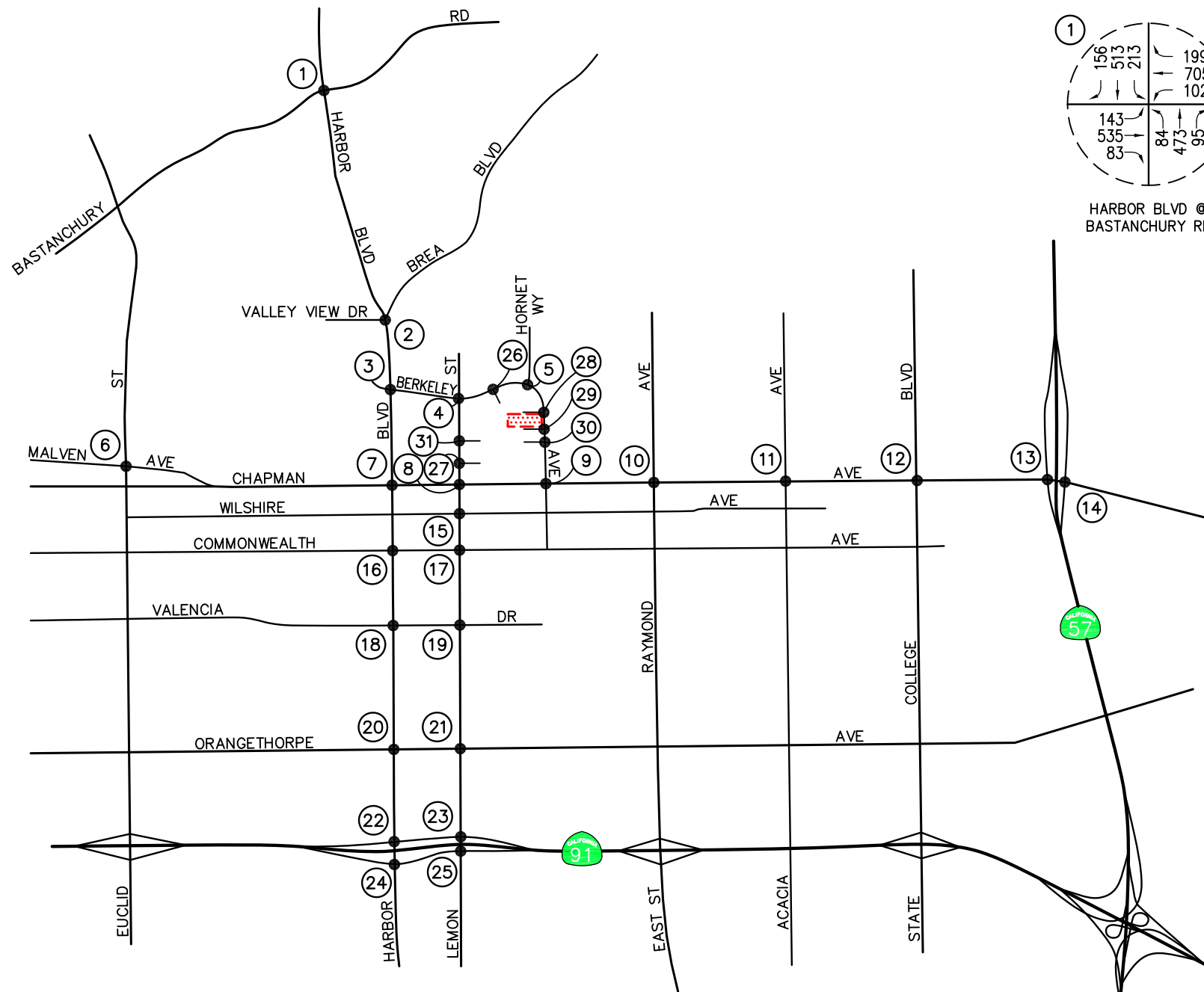






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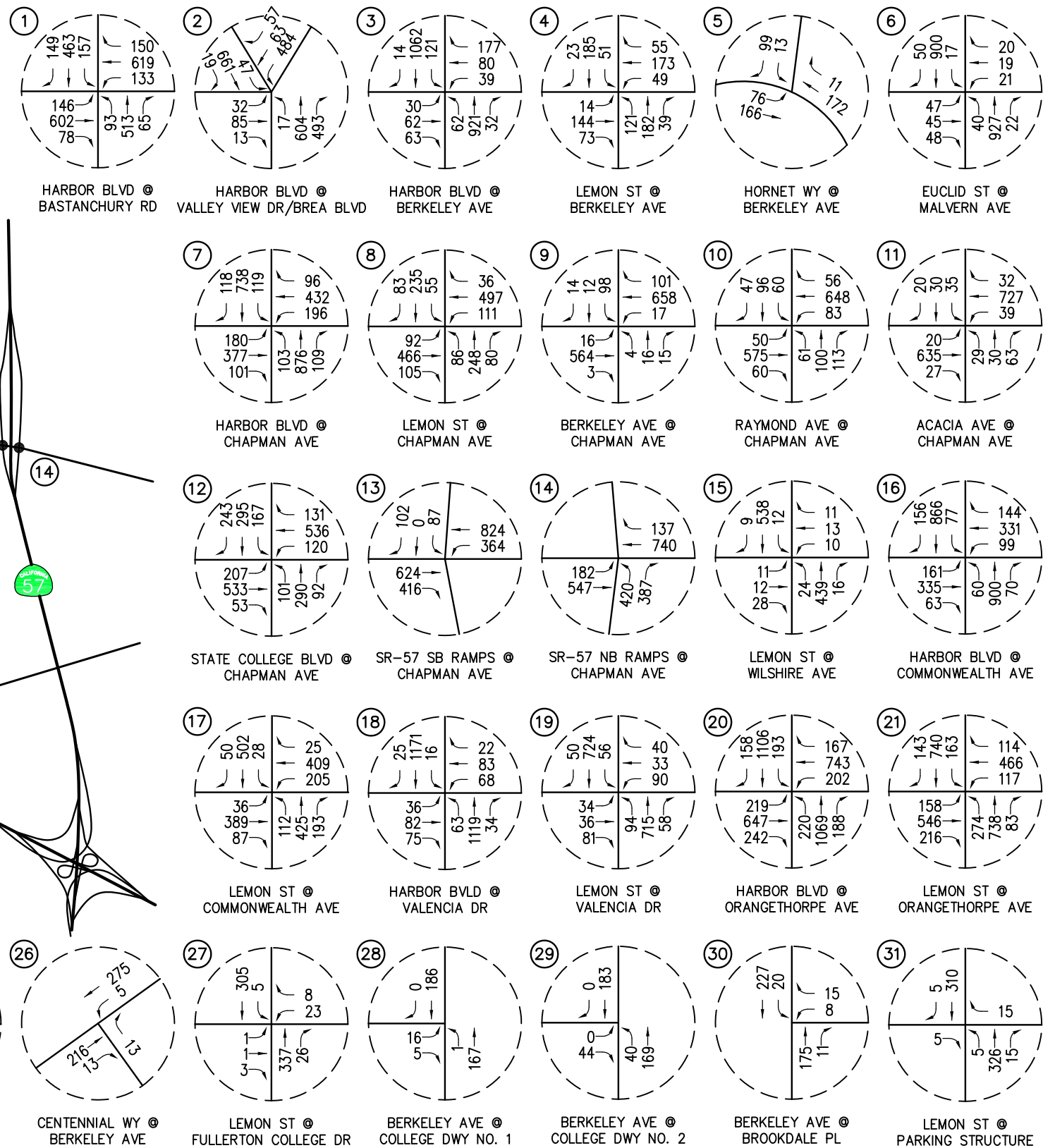
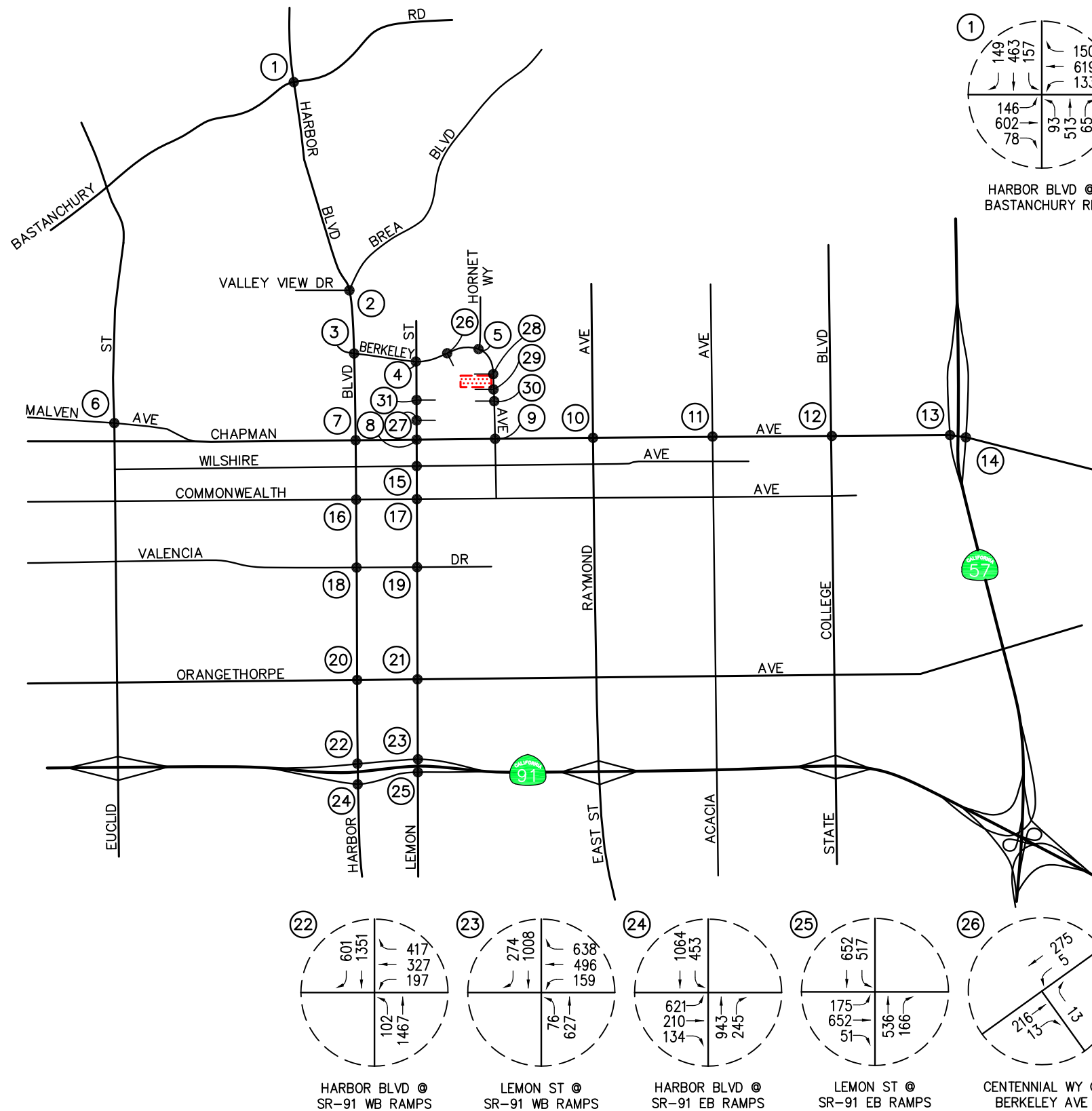
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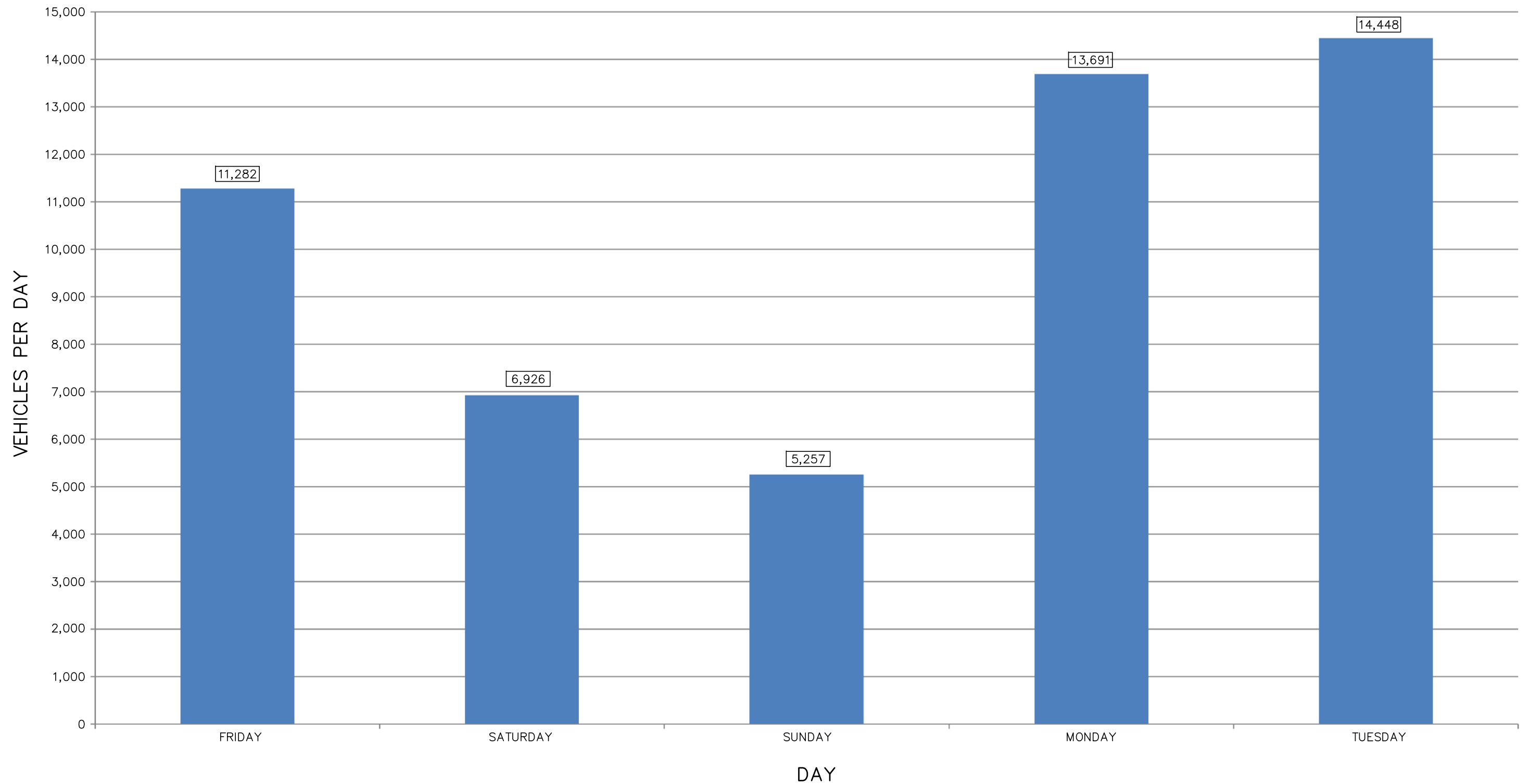
FIGURE 3-6

EXISTING SATURDAY EVENT ARRIVAL PERIOD  
PEAK HOUR TRAFFIC VOLUMES

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON







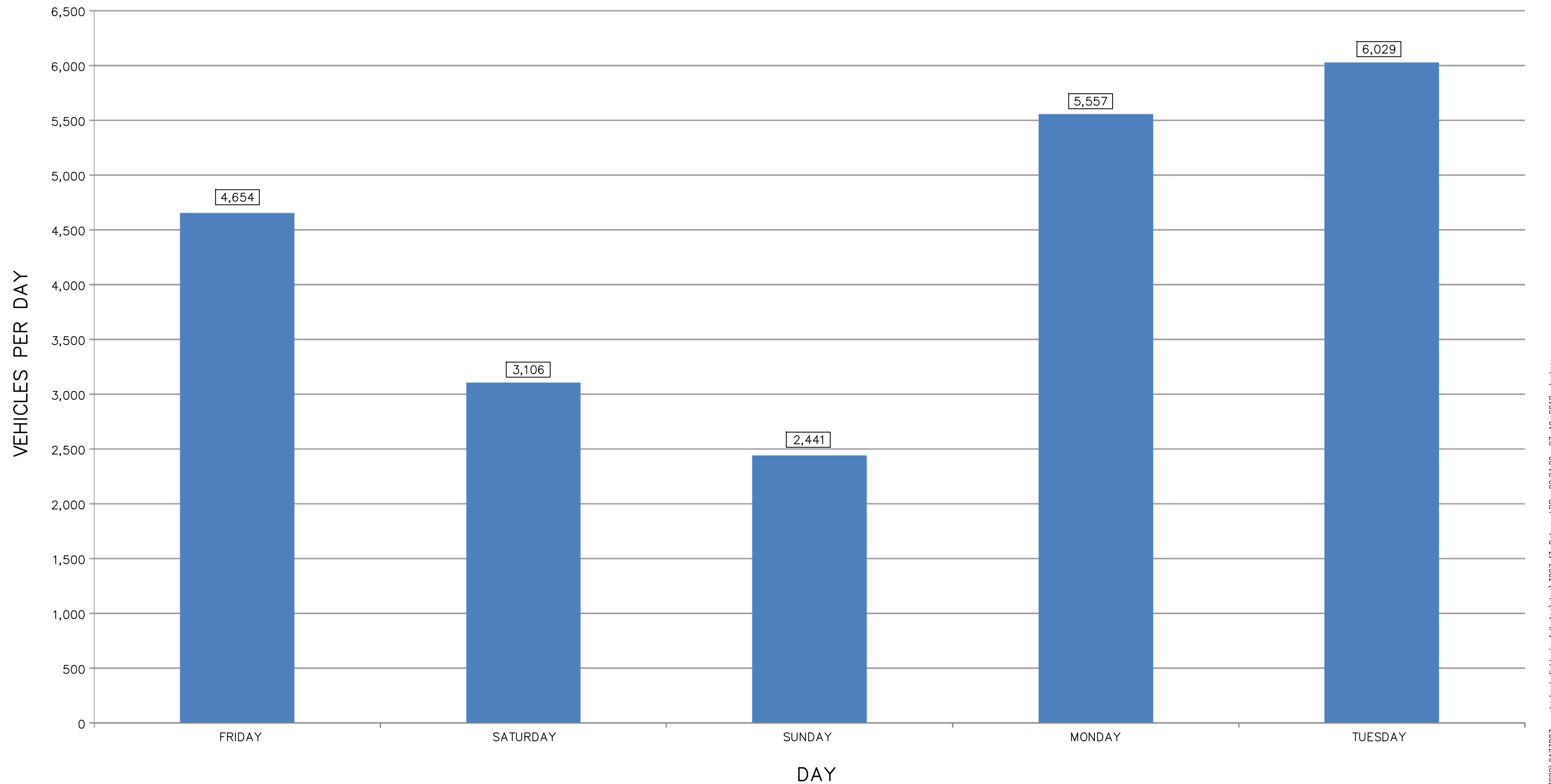
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FIGURE 3-8

EXISTING DAILY PROFILE FOR BERKELEY AVENUE  
EAST OF LEMON STREET

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



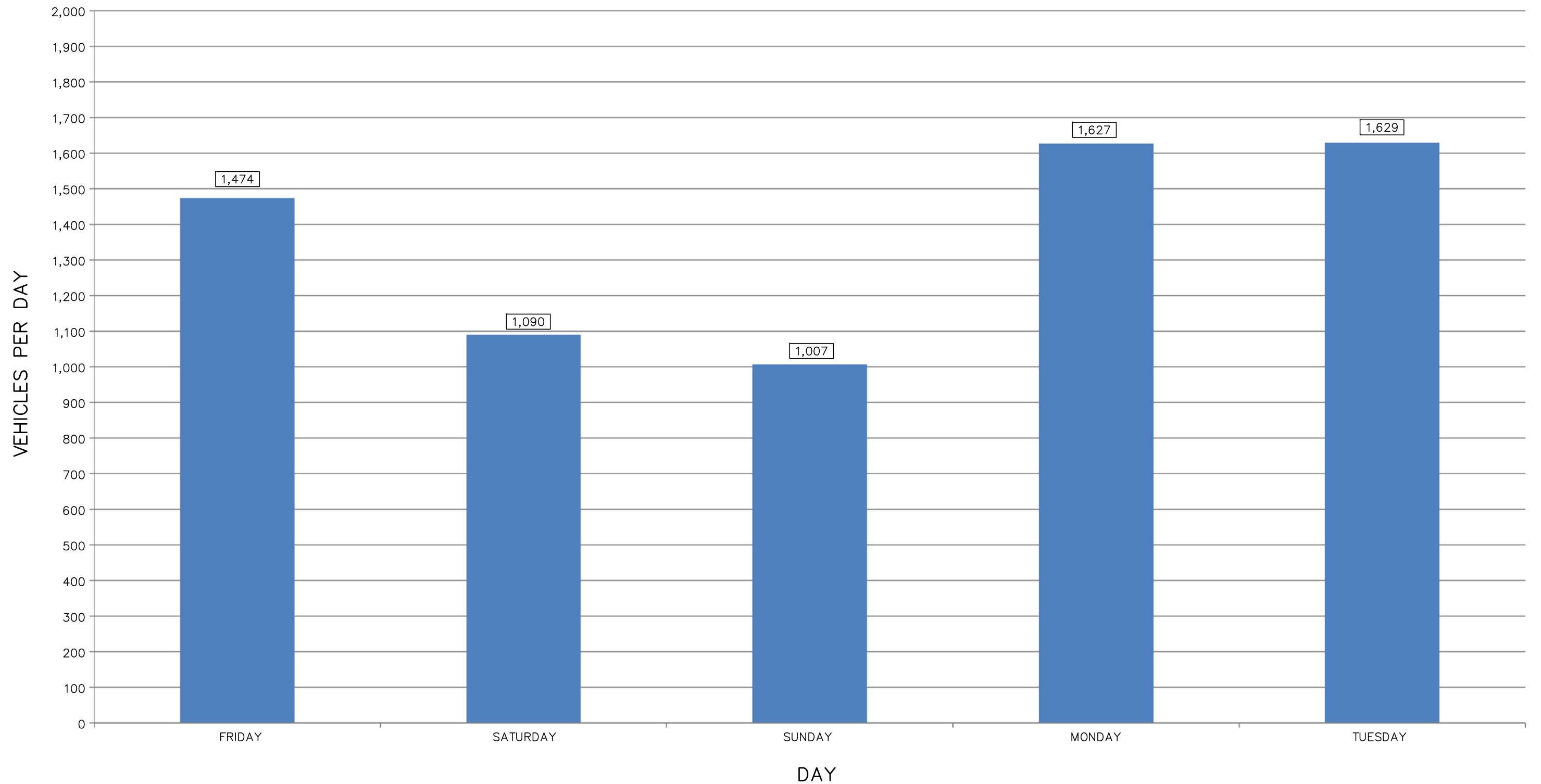
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**FIGURE 3-9**

**EXISTING DAILY PROFILE FOR HORNET WAY  
NORTH OF BERKELEY AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



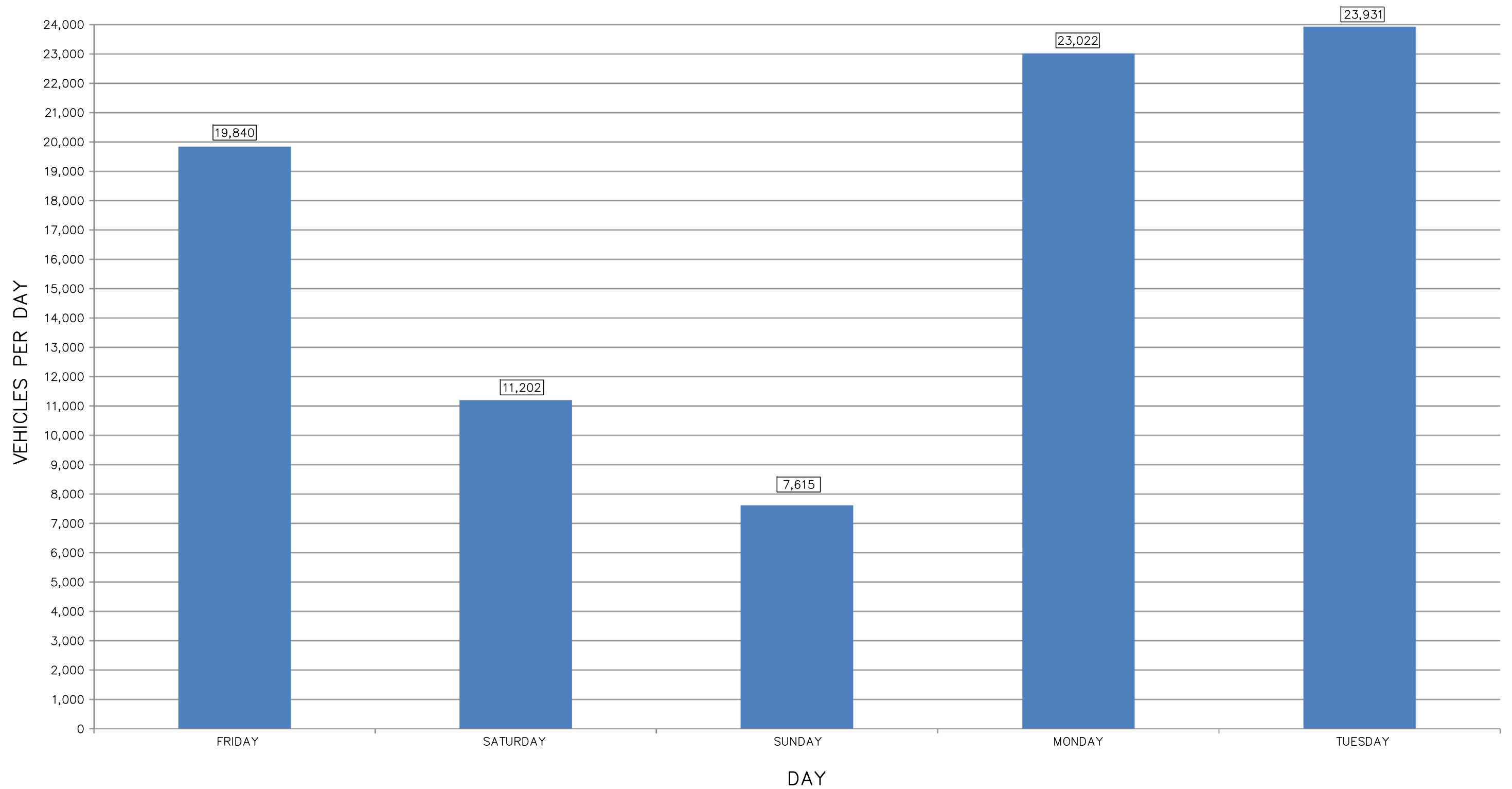
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**FIGURE 3-10**

**EXISTING DAILY PROFILE FOR BROOKDALE PLACE  
EAST OF BERKELEY AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



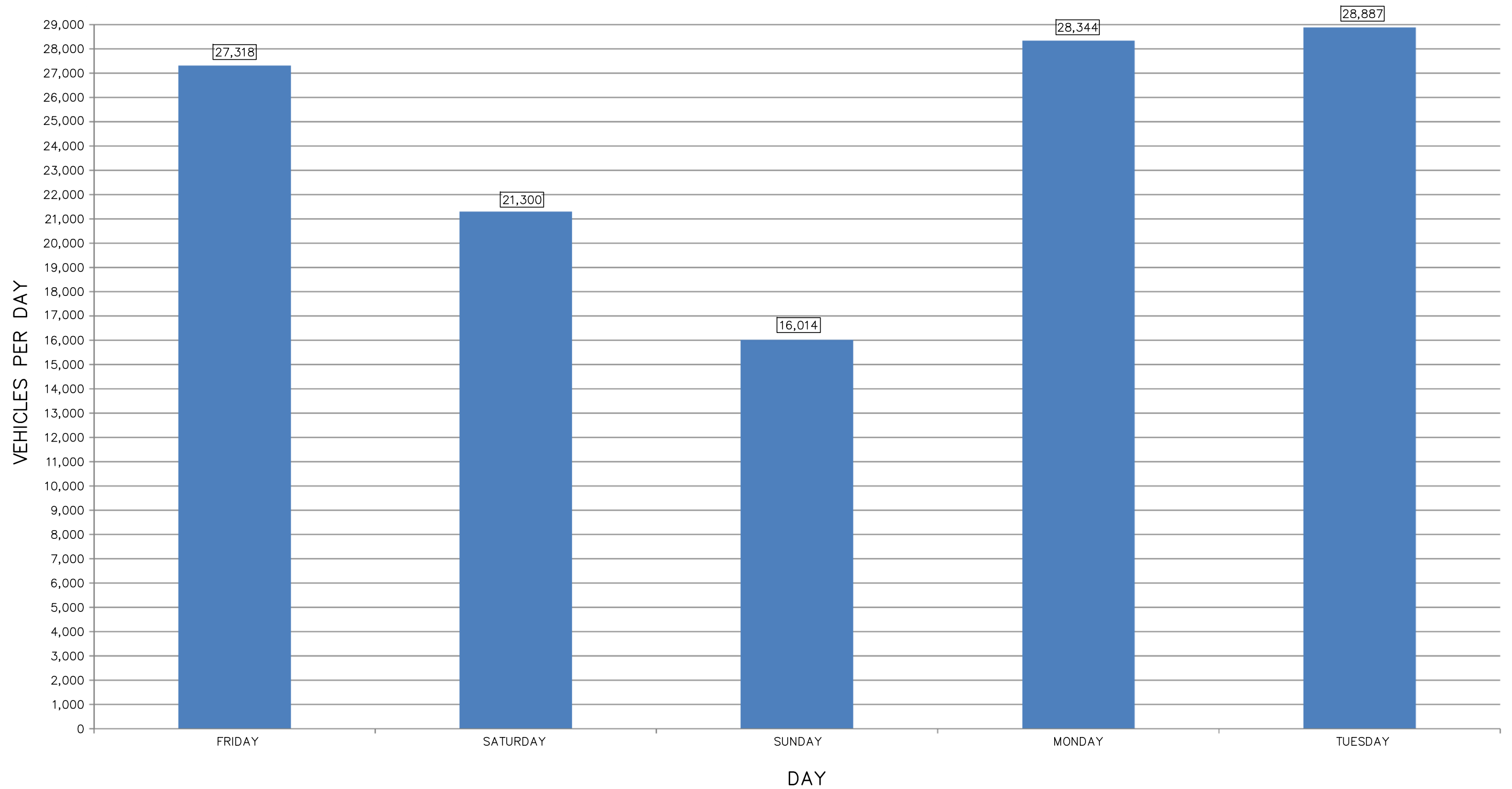
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**FIGURE 3-11**

**EXISTING DAILY PROFILE FOR LEMON STREET  
NORTH OF CHAPMAN AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON

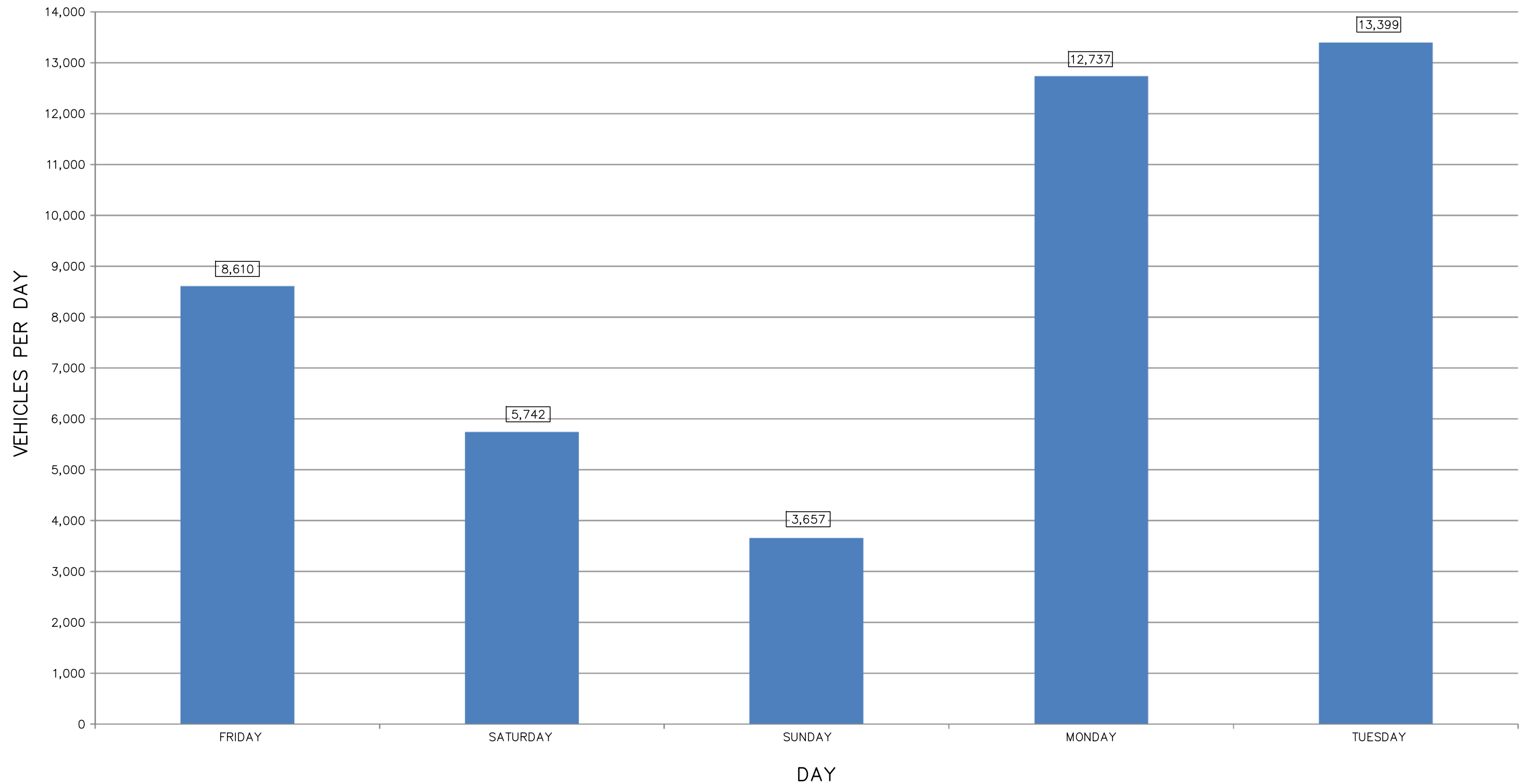


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FIGURE 3-12

EXISTING DAILY PROFILE FOR CHAPMAN AVENUE  
BETWEEN LEMON STREET AND BERKELEY AVENUE  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



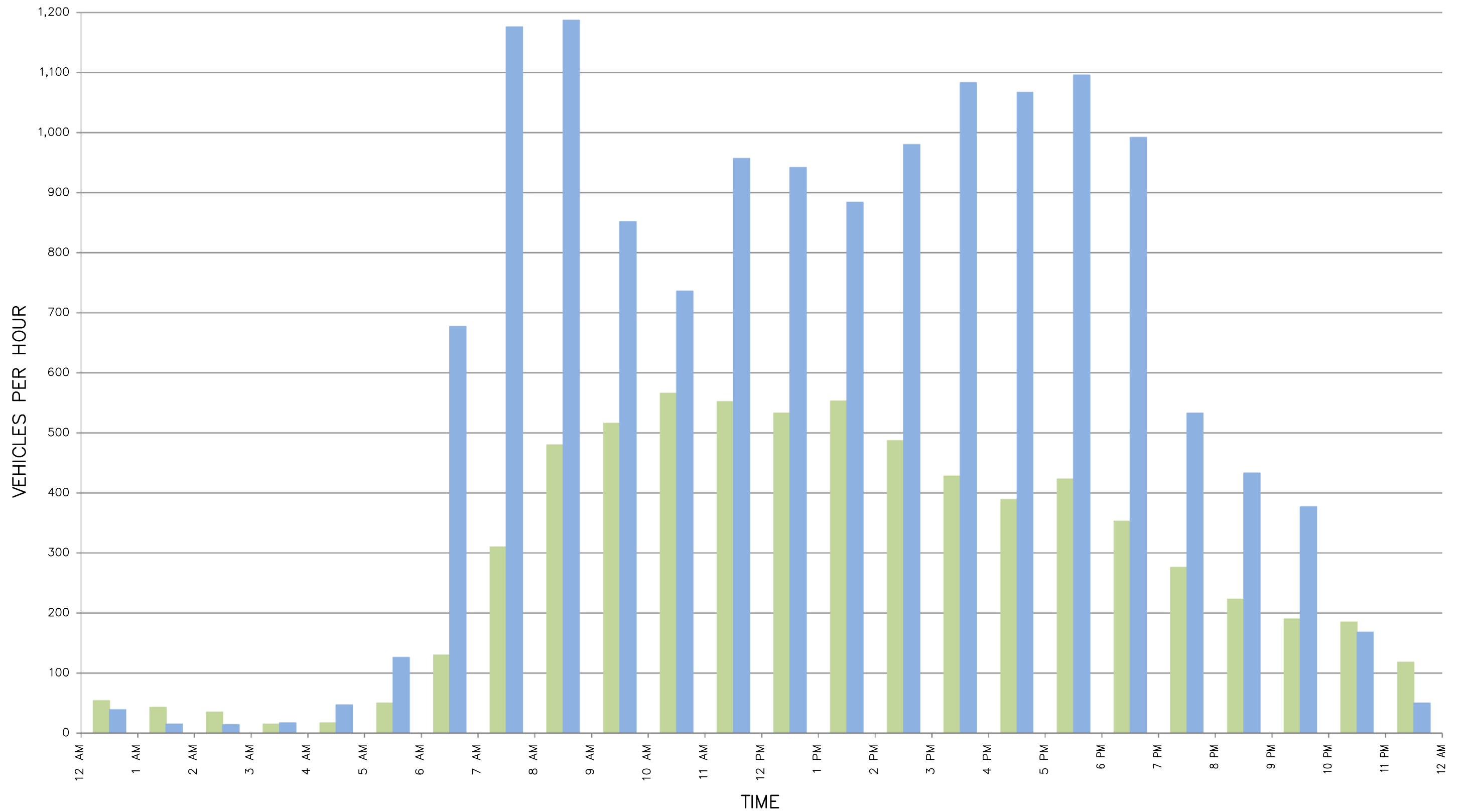
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**FIGURE 3-13**

**EXISTING DAILY PROFILE FOR BERKELEY AVENUE  
NORTH OF CHAPMAN AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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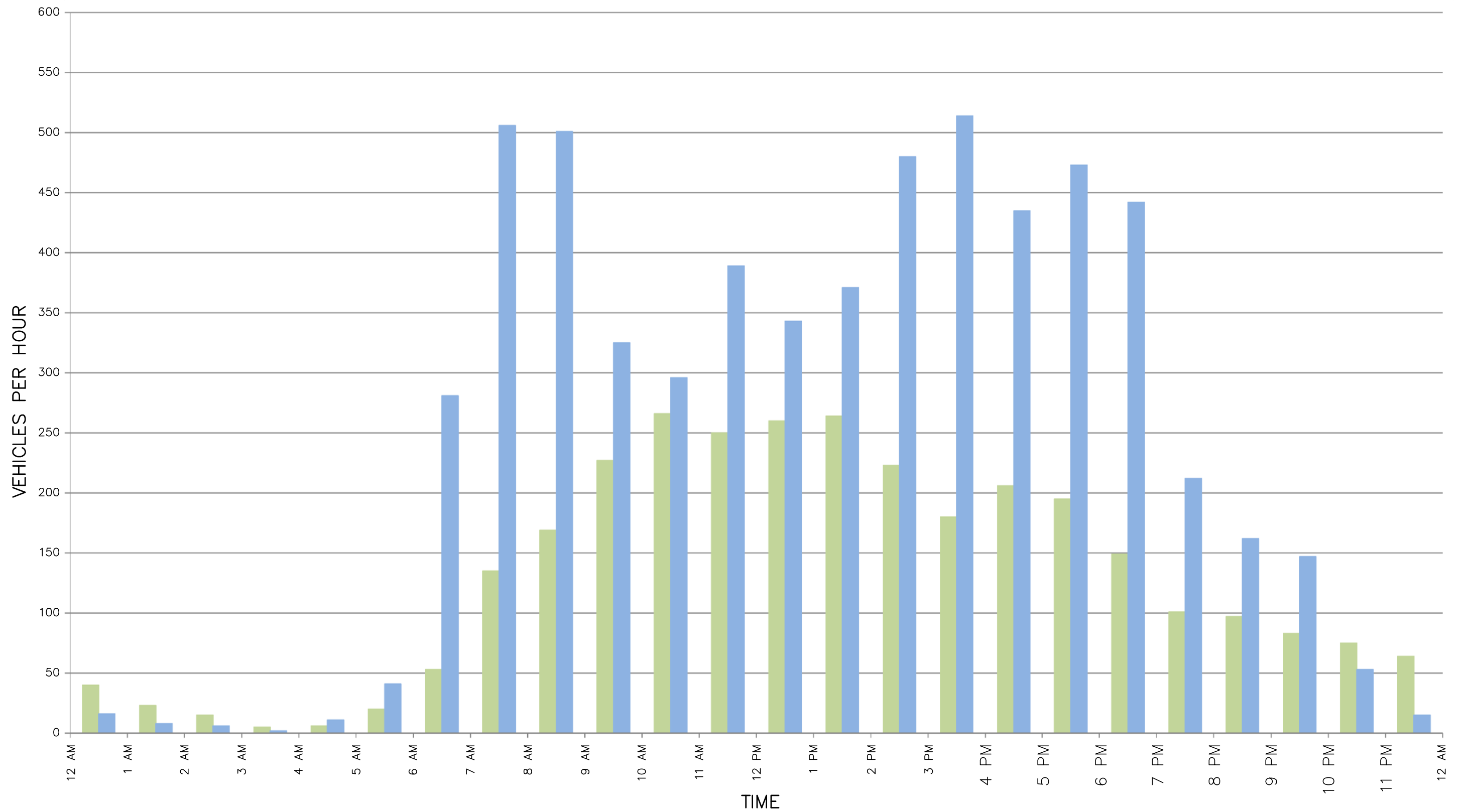


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**FIGURE 3-14**

**EXISTING HOURLY PROFILE FOR BERKELEY AVENUE  
 EAST OF LEMON STREET**  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





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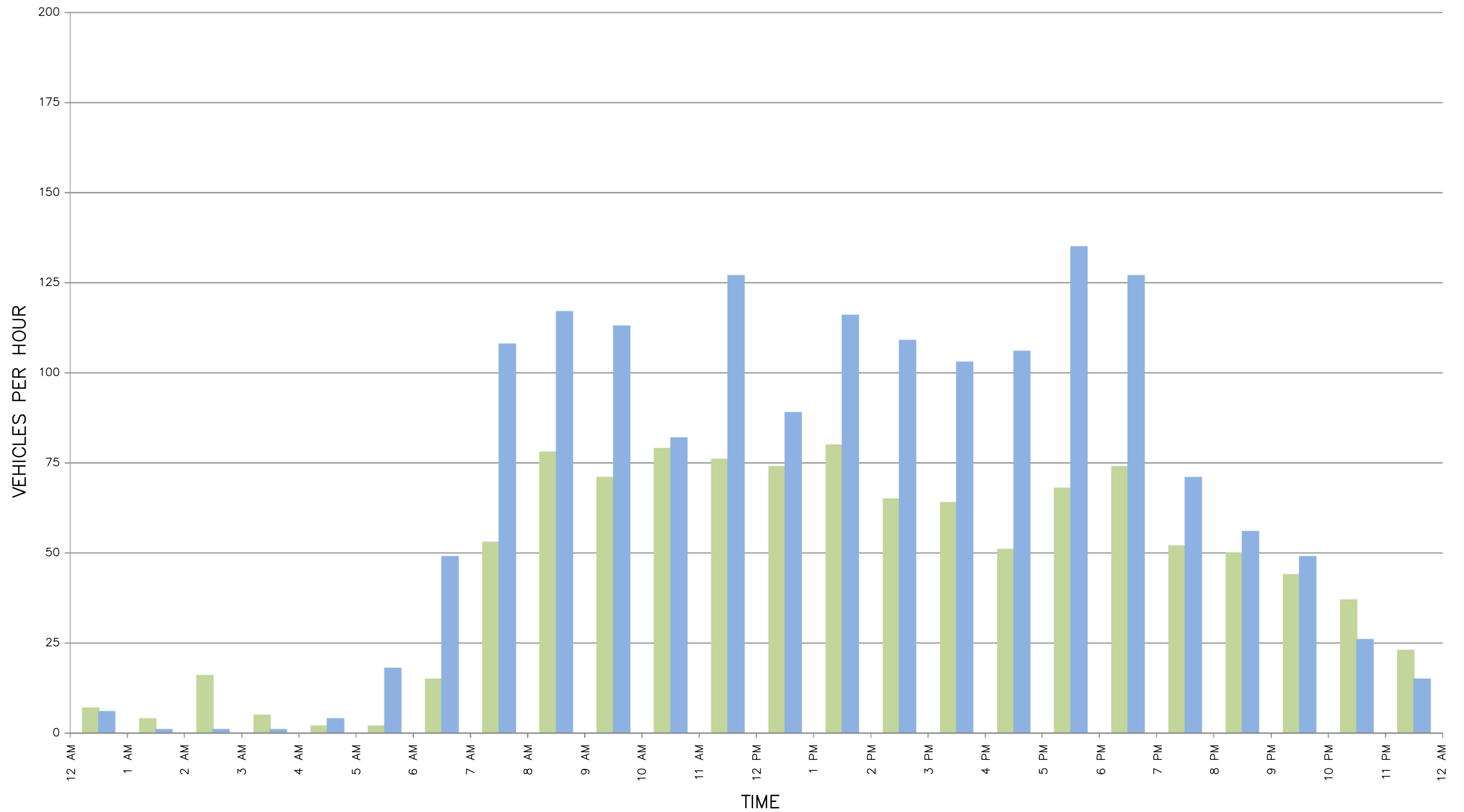


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**FIGURE 3-15**

**EXISTING HOURLY PROFILE FOR HORNET WAY  
 NORTH OF BERKELEY AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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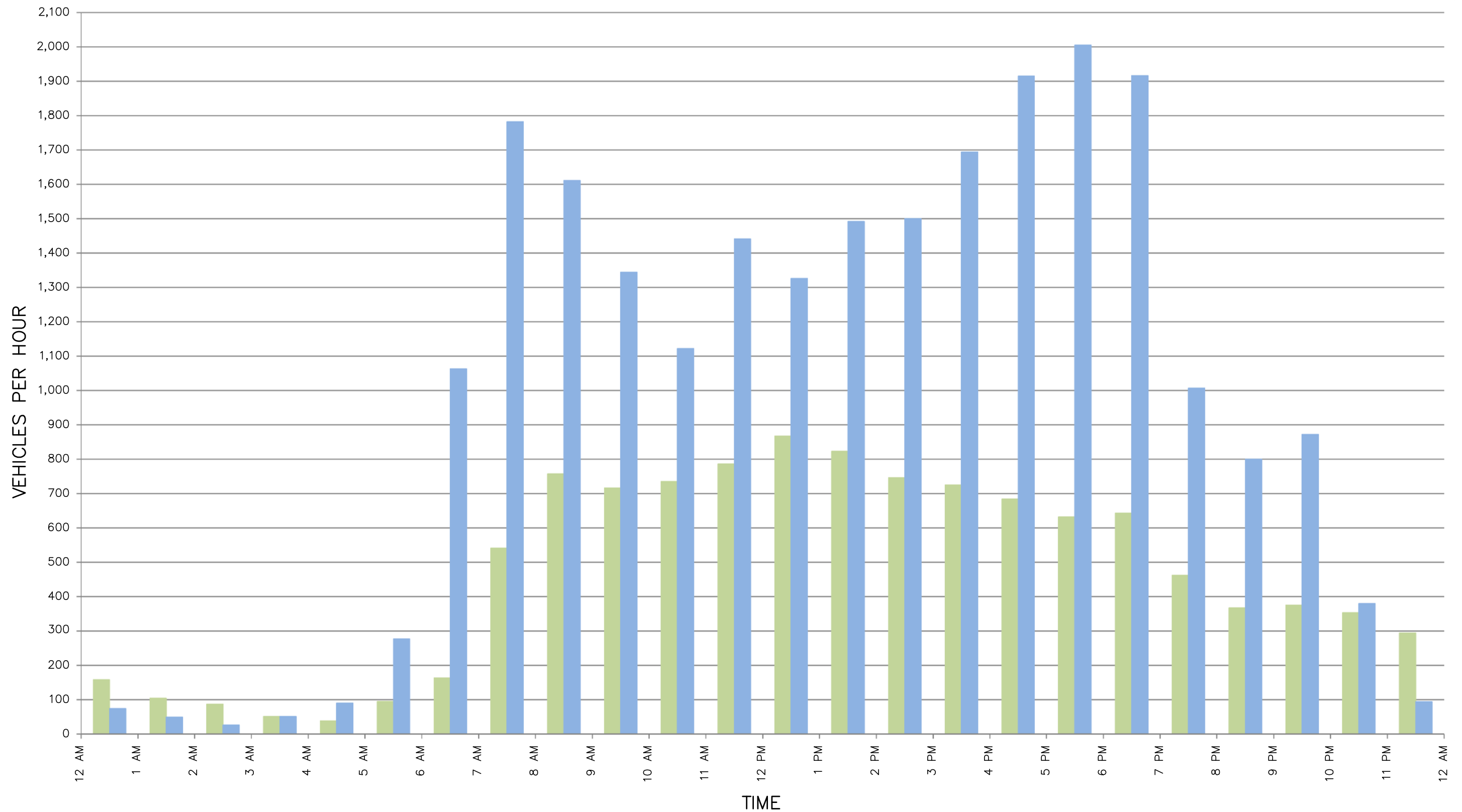


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**FIGURE 3-16**

**EXISTING HOURLY PROFILE FOR BROOKDALE PLACE  
EAST OF BERKELEY AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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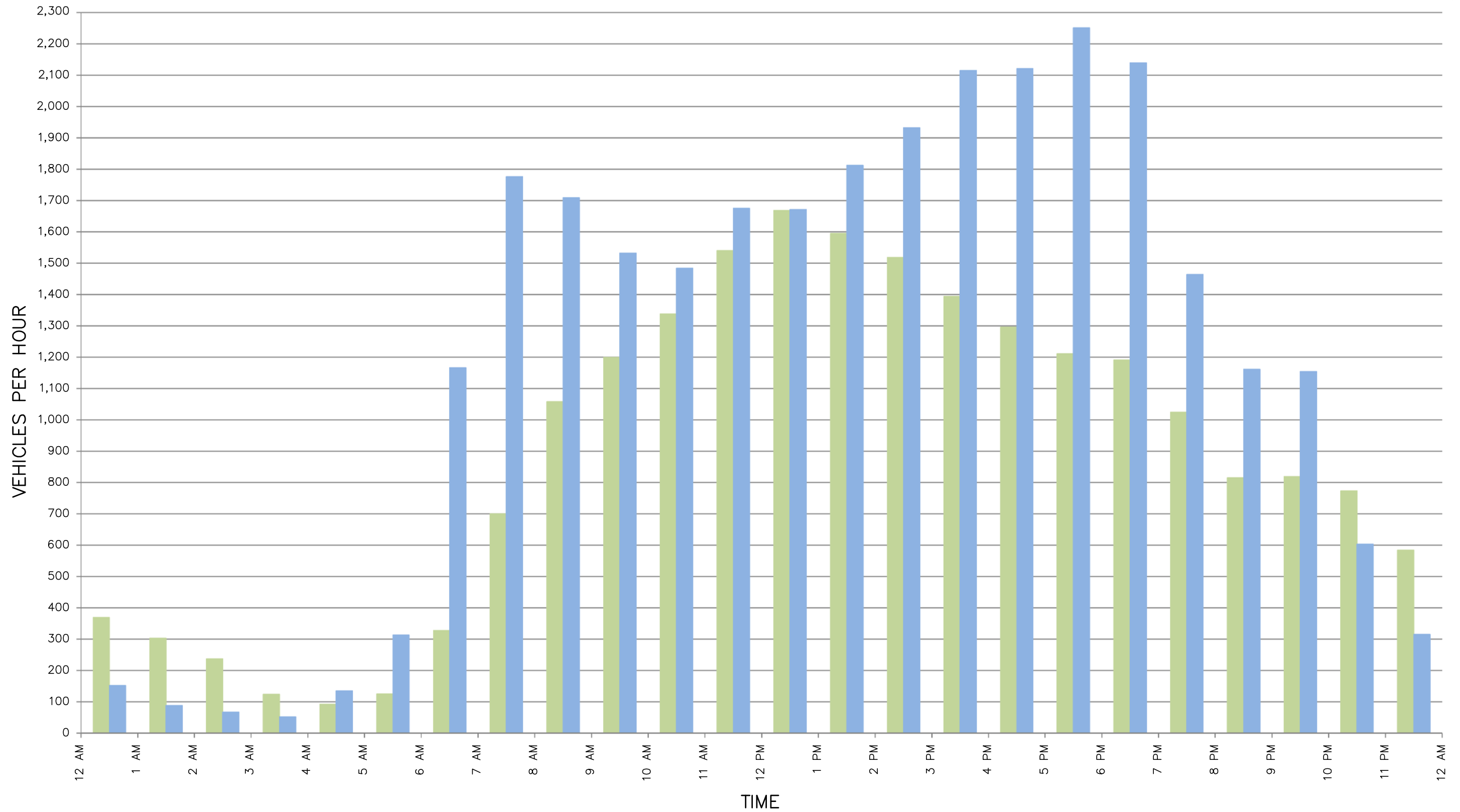


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**FIGURE 3-17**

**EXISTING HOURLY PROFILE FOR LEMON STREET  
 NORTH OF CHAPMAN AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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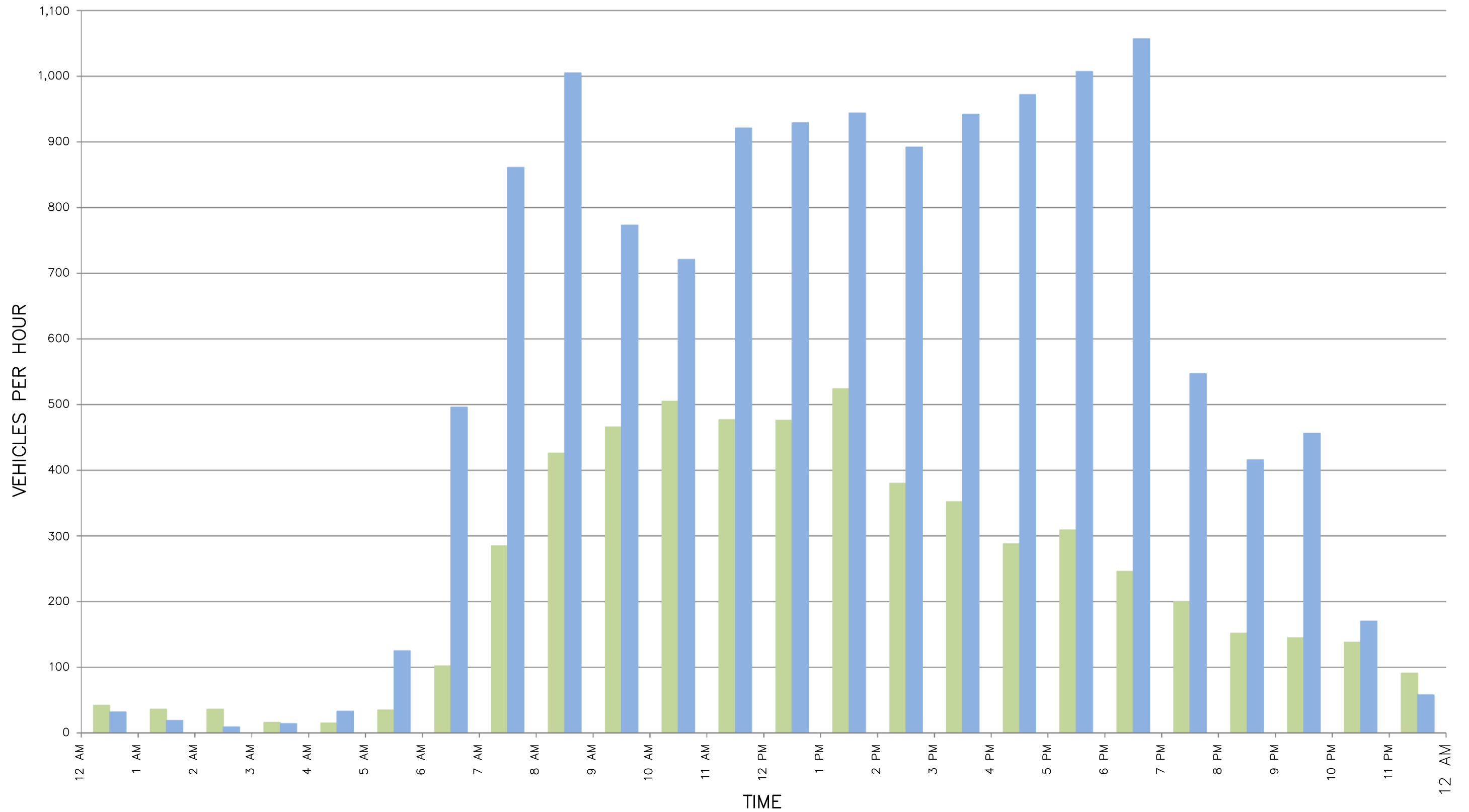
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**FIGURE 3-18**

**EXISTING HOURLY PROFILE FOR CHAPMAN AVENUE  
BETWEEN LEMON STREET AND BERKELEY AVENUE**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





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**FIGURE 3-19**

**EXISTING HOURLY PROFILE FOR BERKELEY AVENUE  
 NORTH OF CHAPMAN AVENUE**  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON

control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in *Table 3-1*.

### **3.6.2 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections)**

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable, which can reduce users' delay tolerance.

#### **3.6.2.1 Two-Way Stop-Controlled Intersections**

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections are shown in *Table 3-2*.

#### **3.6.2.2 All-Way Stop-Controlled Intersections**

All-way stop-controlled intersections require every vehicle to stop at the intersection before proceeding. Because each driver must stop, the decision to proceed into the intersection is a function of traffic conditions on the other approaches. The time between subsequent vehicle departures depends on the degree of conflict that results between the vehicles and vehicles on the other approaches. This methodology determines the control delay for each lane on the approach, computes a weighted average for the whole approach, and computes a weighted average for the intersection as a whole. Level of service (LOS) at the approach and intersection levels is based solely on control delay. The HCM control delay value range for all-way stop-controlled intersections are shown in *Table 3-2*.

### **3.7 Level of Service Criteria**

According to the City of Fullerton, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours. It should be noted that although the City standard is LOS D, there are two intersections located in the Historic Downtown area where LOS E is deemed acceptable to the City because of the fully developed character of the downtown area, the presence of historic properties and the great expense and hardship that would be caused by attempting to secure right-of-way required to improve LOS. The two intersections where LOS E is considered acceptable are: Harbor Boulevard/Chapman Avenue (i.e. key study intersection #6) and Harbor Boulevard/Commonwealth Avenue (i.e. key study intersection #16). LOS E is also considered acceptable at the CMP intersection of Harbor Boulevard/Orangethorpe Avenue (i.e. key study intersection #20).

### 3.8 Level of Service Input Parameters

Per City staff, the following values were applied in the level of service analyses, which have been conducted using the Vistro software (HCM 6 Methodology):

- **Base Saturation Flow Rate:** 1800 passenger cars per hour per lane (pc/hr/ln) [left and right turn movement], 3500 pc/hr/ln (dual left turn movement) and 1900 pc/hr/ln (through movement)
- **Cycle Length:** based on existing timings as provided by City staff
- **Loss Time:** 2 seconds per critical phase
- **Minimum Pedestrian Crossing Time:** calculated by using the minimum pedestrian crossing time equation
- **Analysis Time Period:** 0.25 hour
- **Peak Hour Factor:** based on existing counts

### 3.9 Existing Level of Service Results

*Table 3-3* summarizes the existing weekday PM peak hour service level calculations for the key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-3* indicates that thirty (30) of the thirty-one (31) key study intersections currently operate at an acceptable service level during the PM peak hour. The intersection of Harbor Boulevard at Bastanchury Road (i.e. key study intersection #1) currently operates at LOS during the PM peak hour.

*Table 3-4* summarizes the existing Saturday Event Arrival and Event Departure peak hour service level calculations for the key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-3* indicates that all thirty-one (31) key study intersections currently operate at an acceptable service level during the Saturday Event Arrival and Event Departure peak hours.

*Appendix B* presents the HCM/LOS calculation worksheets for the key study intersections for the weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour.

**TABLE 3-1**  
**LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)<sup>2</sup>**

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	$\leq 10.0$	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	$> 10.0$ and $\leq 20.0$	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	$> 20.0$ and $\leq 35.0$	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	$> 35.0$ and $\leq 55.0$	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high $v/c$ ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	$> 55.0$ and $\leq 80.0$	Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high $v/c$ ratios. Individual cycle failures are frequent occurrences.
F	$\geq 80.0$	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high $v/c$ ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

<sup>2</sup> Source: *Highway Capacity Manual 6*, Chapter 19: Signalized Intersections.



**TABLE 3-2****LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)<sup>3,4</sup>**

<b>Level of Service (LOS)</b>	<b>Highway Capacity Manual (HCM) Delay Per Vehicle (seconds/vehicle)</b>	<b>Level of Service Description</b>
A	$\leq 10.0$	Little or no delay
B	$> 10.0$ and $\leq 15.0$	Short traffic delays
C	$> 15.0$ and $\leq 25.0$	Average traffic delays
D	$> 25.0$ and $\leq 35.0$	Long traffic delays
E	$> 35.0$ and $\leq 50.0$	Very long traffic delays
F	$> 50.0$	Severe congestion

<sup>3</sup> Source: *Highway Capacity Manual 6*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

<sup>4</sup> Source: *Highway Capacity Manual 6*, Chapter 21: All-Way Stop-Controlled Intersections. For approaches and intersection-wide assessment, LOS is defined solely by control delay.

**TABLE 3-3**  
**EXISTING WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersection	Minimum Acceptable LOS	Time Period	Control Type	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Weekday PM	8Ø Traffic Signal	<b>57.0 s/v</b>	<b>E</b>
2. Harbor Boulevard at Valley View Drive/Brea Boulevard	D	Weekday PM	6Ø Traffic Signal	30.0 s/v	C
3. Harbor Boulevard at Berkeley Avenue	D	Weekday PM	5Ø Traffic Signal	30.9 s/v	C
4. Lemon Street at Berkeley Avenue	D	Weekday PM	3Ø Traffic Signal	38.6 s/v	D
5. Hornet Way at Berkeley Avenue	D	Weekday PM	2Ø Traffic Signal	13.4 s/v	B
6. Euclid Street at Malvern Avenue	D	Weekday PM	8Ø Traffic Signal	34.0 s/v	C
7. Harbor Boulevard at Chapman Avenue	E	Weekday PM	8Ø Traffic Signal	31.5 s/v	C
8. Lemon Street at Chapman Avenue	D	Weekday PM	8Ø Traffic Signal	34.2 s/v	C
9. Berkeley Avenue at Chapman Avenue	D	Weekday PM	4Ø Traffic Signal	18.0 s/v	B
10. Raymond Avenue at Chapman Avenue	D	Weekday PM	8Ø Traffic Signal	26.2 s/v	C
11. Acacia Avenue at Chapman Avenue	D	Weekday PM	5Ø Traffic Signal	18.1 s/v	B
12. State College Boulevard at Chapman Avenue	D	Weekday PM	8Ø Traffic Signal	35.8 s/v	D
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	3Ø Traffic Signal	18.2 s/v	B
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	3Ø Traffic Signal	26.5 s/v	C
15. Lemon Street at Wilshire Avenue	D	Weekday PM	2Ø Traffic Signal	10.3 s/v	B
16. Harbor Boulevard at Commonwealth Avenue	E	Weekday PM	8Ø Traffic Signal	30.8 s/v	C

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle
- Ø = phase; referring to operation phasing of a traffic signal

**TABLE 3-3 (CONTINUED)**  
**EXISTING WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersection	Minimum Acceptable LOS	Time Period	Control Type	HCM	LOS
17. Lemon Street at Commonwealth Avenue	D	Weekday PM	8Ø Traffic Signal	33.9 s/v	C
18. Harbor Boulevard at Valencia Drive	D	Weekday PM	2Ø Traffic Signal	26.5 s/v	C
19. Lemon Street at Valencia Drive	D	Weekday PM	2Ø Traffic Signal	10.1 s/v	B
20. Harbor Boulevard at Orangethorpe Avenue	E	Weekday PM	8Ø Traffic Signal	38.8 s/v	D
21. Lemon Street at Orangethorpe Avenue	D	Weekday PM	8Ø Traffic Signal	36.6 s/v	D
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	3Ø Traffic Signal	17.2 s/v	B
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	3Ø Traffic Signal	24.5 s/v	C
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	3Ø Traffic Signal	19.6 s/v	B
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	3Ø Traffic Signal	23.0 s/v	C
26. Centennial Way at Berkeley Avenue	D	Weekday PM	One-Way Stop	12.5 s/v	B
27. Lemon Street at Fullerton College Drive	D	Weekday PM	3Ø Traffic Signal	16.0 s/v	B
28. Berkeley Avenue at College Driveway No. 1	D	Weekday PM	One-Way Stop	12.9 s/v	B
29. Berkeley Avenue at College Driveway No. 2	D	Weekday PM	One-Way Stop	12.3 s/v	B
30. Berkeley Avenue at Brookdale Place	D	Weekday PM	One-Way Stop	13.9 s/v	B
31. Lemon Street at Parking Structure	D	Weekday PM	Two-Way Stop	16.4 s/v	C

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle
- Ø = phase; referring to operation phasing of a traffic signal

**TABLE 3-4**  
**EXISTING SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersection	Minimum Acceptable LOS	Time Period	Control Type	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	35.5 s/v 35.0 s/v	D C
2. Harbor Boulevard at Valley View Drive/Brea Boulevard	D	Sat. Arrival Sat. Departure	6Ø Traffic Signal	26.7 s/v 26.8 s/v	C C
3. Harbor Boulevard at Berkeley Avenue	D	Sat. Arrival Sat. Departure	5Ø Traffic Signal	19.7 s/v 16.5 s/v	B B
4. Lemon Street at Berkeley Avenue	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	34.8 s/v 33.9 s/v	C C
5. Hornet Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	2Ø Traffic Signal	11.5 s/v 14.0 s/v	B B
6. Euclid Street at Malvern Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	11.0 s/v 10.9 s/v	B B
7. Harbor Boulevard at Chapman Avenue	E	Sat. Arrival Sat. Departure	8Ø Traffic Signal	26.5 s/v 26.5 s/v	C C
8. Lemon Street at Chapman Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	33.1 s/v 32.9 s/v	C C
9. Berkeley Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	4Ø Traffic Signal	10.0 s/v 9.5 s/v	A A
10. Raymond Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	19.5 s/v 18.5 s/v	B B
11. Acacia Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	5Ø Traffic Signal	8.7 s/v 10.7 s/v	A B
12. State College Boulevard at Chapman Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	37.1 s/v 36.9 s/v	D D
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	17.6 s/v 18.4 s/v	B B
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	25.2 s/v 26.7 s/v	C C
15. Lemon Street at Wilshire Avenue	D	Sat. Arrival Sat. Departure	2Ø Traffic Signal	6.5 s/v 5.0 s/v	A A
16. Harbor Boulevard at Commonwealth Avenue	E	Sat. Arrival Sat. Departure	8Ø Traffic Signal	30.8 s/v 30.4 s/v	C C

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle
- Ø = phase; referring to operation phasing of a traffic signal

**TABLE 3-4 (CONTINUED)**  
**EXISTING SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

	<b>Key Intersection</b>	<b>Minimum Acceptable LOS</b>	<b>Time Period</b>	<b>Control Type</b>	<b>HCM</b>	<b>LOS</b>
17.	Lemon Street at Commonwealth Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	32.4 s/v 32.4 s/v	C C
18.	Harbor Boulevard at Valencia Drive	D	Sat. Arrival Sat. Departure	2Ø Traffic Signal	11.5 s/v 11.6 s/v	B B
19.	Lemon Street at Valencia Drive	D	Sat. Arrival Sat. Departure	2Ø Traffic Signal	10.5 s/v 11.0 s/v	B B
20.	Harbor Boulevard at Orangethorpe Avenue	E	Sat. Arrival Sat. Departure	8Ø Traffic Signal	39.2 s/v 38.0 s/v	D D
21.	Lemon Street at Orangethorpe Avenue	D	Sat. Arrival Sat. Departure	8Ø Traffic Signal	34.1 s/v 32.9 s/v	C C
22.	Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	17.3 s/v 20.1 s/v	B C
23.	Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	27.7 s/v 24.8 s/v	C C
24.	Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	23.6 s/v 22.4 s/v	C C
25.	Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	27.8 s/v 27.8 s/v	C C
26.	Centennial Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	One-Way Stop	10.2 s/v 9.7 s/v	B A
27.	Lemon Street at Fullerton College Drive	D	Sat. Arrival Sat. Departure	3Ø Traffic Signal	14.4 s/v 4.9 s/v	B A
28.	Berkeley Avenue at College Driveway No. 1	D	Sat. Arrival Sat. Departure	One-Way Stop	11.2 s/v 10.4 s/v	B B
29.	Berkeley Avenue at College Driveway No. 2	D	Sat. Arrival Sat. Departure	One-Way Stop	10.7 s/v 9.8 s/v	B A
30.	Berkeley Avenue at Brookdale Place	D	Sat. Arrival Sat. Departure	One-Way Stop	11.7 s/v 9.9 s/v	B A
31.	Lemon Street at Parking Structure	D	Sat. Arrival Sat. Departure	Two-Way Stop	10.1 s/v 9.5 s/v	B A

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle
- Ø = phase; referring to operation phasing of a traffic signal

## 4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

## 5.0 PROJECT TRAFFIC CHARACTERISTICS

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are typically found in the 10<sup>th</sup> Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017]. Since trip generation rates for the proposed Project categories are not specifically contained within the ITE *Trip Generation* manual, the trip generation potential was estimated based on the following:

- Academic instruction = based on the proposed evening class schedule and size.
- Field event = based on empirical rates developed from counts/observations conducted at Yorba Linda High School during a Fullerton College football game.

The following describes the project trip generation details for the academic instruction project component and the field event project component.

### 5.1 Project Traffic Generation – Academic Instruction

As stated above, the trip generation potential for the weekday evening classes (i.e. academic instruction) is based on the Proposed Sherbeck Field Schedule and Programming table provided by Fullerton College Staff and the maximum student size of the classes. The following assumptions were utilized to develop the trip generation for academic instruction.

- Evening classes would begin at 6:00 PM with a maximum of two classes utilizing the field at the same time.
- The class size would range from 24 students to 32 students with 1 teacher. The traffic study assumes 32 students and 1 teacher to provide a conservative forecast.
- Based on information provided by Fullerton College Staff, the majority of students enrolling in these evening classes will already be on campus for other classes. However, in order to provide a conservative forecast, the traffic study assumes that all students and teachers would be new trips and that they would arrive prior to 6:00 PM during the weekday PM peak hour.

Based on the aforementioned assumptions, **Table 5-1** presents the Project's (i.e. academic instruction) forecast daily and PM peak hour traffic volumes. Review of **Table 5-1** shows that the proposed Project (i.e. academic instruction) is forecast to generate 528 weekday daily trips and 66 weekday PM peak hour trips (66 inbound and 0 outbound).

### 5.2 Project Traffic Generation – Field Event

As stated above, the trip generation potential for the field event is based on empirical trip rates developed from counts/observations conducted at Yorba Linda High School during a Fullerton College football game and applied to the proposed Project's maximum seating attendance of 4,417 seats. The following describes the details of the counts/observations conducted at Yorba Linda High School during a Fullerton College football game.

- Saturday traffic counts/observations were conducted at Yorba Linda High School on October 21, 2017 during the Fullerton College football game against Saddleback College, which had an attendance of 1,100 people and a start time of 1:00 PM.
- Traffic counts/observations were conducted at the three driveways along Bastanchury Road between 11:30 AM and 1:30 PM during the football game's arrival period and between 3:30 PM and 5:30 PM during the football game's departure period in order to determine the trip generation for the field event, which included an adjustment to the traffic counts to eliminate any non-football game related traffic at the high school during the arrival and departure periods.
- The Saturday traffic counts indicated that the Fullerton College football game generated 1,072 daily trips, 388 trips during the arrival peak hour (306 inbound and 82 outbound) and 416 trips during the departure peak hour (35 inbound and 381 outbound).
- The aforementioned trips were then divided by the game attendance (i.e. 1,100 people) to determine the Saturday daily, Saturday Arrival peak hour and Saturday Departure peak hour trip rates per seat specific to a Fullerton College football game.

It should be noted that the procedures described above that were utilized to develop the empirical rates for a Fullerton College football game are generally consistent with the trip generation study procedures contained within the *ITE Trip Generation Handbook*. It should be further noted, that even though only one football game was studied, the use of empirical rates developed specifically for the proposed project land use is typically the most accurate form for establishing the proposed Project's trip generation potential. Furthermore, the trip generation rates are based on trips per spectator, which would not vary significantly per game, given that the average vehicle occupancy (AVO) would not vary significantly either.

**Table 5-2** summarizes the Saturday trip generation rates and presents the Project's (i.e. field event) forecast Saturday daily, Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic volumes. Review of **Table 5-2** shows that the proposed Project (i.e. field event with 4,417 occupied seats) is forecast to generate 4,307 Saturday daily trips, 1,559 Saturday Event Arrival peak hour trips (1,228 inbound and 331 outbound) and 1,669 Saturday Event Departure peak hour trips (141 inbound and 1,528 outbound).

**Appendix C** contains the traffic counts/observations conducted at Yorba Linda High School on October 21, 2017 during the Fullerton College football game against Saddleback College.

### 5.3 Project Traffic Distribution and Assignment

**Figures 5-1** and **5-2** present the Year 2020 and Year 2030 general traffic distribution patterns for the proposed Project (i.e. academic instruction), respectively. **Figures 5-3** and **5-4** present the Year 2020 and Year 2030 general traffic distribution patterns for the proposed Project (i.e. field event), respectively. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- the site's proximity to major traffic carriers (i.e. Lemon Street, Chapman Avenue, Harbor Boulevard, SR-57 Freeway, SR-91 Freeway, etc.),



- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals,
- review of existing peak hour traffic volumes and the location of parking lots, and
- ingress/egress availability at the project site.

It should be noted that key study intersection #29 (i.e. Berkeley Avenue/College Driveway No. 2) was assumed to only provide egress movements from the campus in the Year 2030, consistent with the Fullerton College Master Plan Traffic Study.

The anticipated Year 2020 and Year 2030 weekday PM peak hour project traffic volumes associated with the Project (i.e. academic instruction) are presented in **Figures 5-5** and **5-6**, respectively. The traffic volume assignments presented in **Figures 5-5** and **5-6** reflect the traffic distribution characteristics shown in **Figures 5-1/5-2** and the traffic generation forecast presented in **Table 5-1**.

The anticipated Year 2020 Saturday Event Arrival peak hour and Saturday Event Departure peak hour project traffic volumes associated with the Project (i.e. field event) are presented in **Figures 5-7** and **5-8**, respectively. The traffic volume assignments presented in **Figures 5-7** and **5-8** reflect the traffic distribution characteristics shown in **Figure 5-3** and the traffic generation forecast presented in **Table 5-2**.

The anticipated Year 2030 Saturday Event Arrival peak hour and Saturday Event Departure peak hour project traffic volumes associated with the Project (i.e. field event) are presented in **Figures 5-9** and **5-10**, respectively. The traffic volume assignments presented in **Figures 5-9** and **5-10** reflect the traffic distribution characteristics shown in **Figure 5-4** and the traffic generation forecast presented in **Table 5-2**.

#### **5.4 Existing Plus Project Traffic Conditions**

The Existing plus Project traffic conditions have been developed based upon existing conditions and the estimated Project traffic. These forecast traffic conditions have been prepared pursuant to the California Environmental Quality Act (CEQA) guidelines, which require that the potential impacts of a Project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

**Figure 5-11** presents projected weekday PM peak hour traffic volumes at the thirty-one (31) key study locations with the addition of the trips generated by the proposed Project (i.e. academic instruction) to existing traffic volumes. **Figures 5-12** and **5-13** present projected Saturday Event Arrival Period and Saturday Event Departure Period peak hour traffic volumes at the thirty-one (31) key study locations with the addition of the trips generated by the proposed Project (i.e. field event) to existing traffic volumes, respectively.

**TABLE 5-1**  
**WEEKDAY ACADEMIC INSTRUCTION PROJECT TRAFFIC GENERATION FORECAST**

Project Description	Daily 2-Way	Weekday Academic Instruction PM Peak Hour		
		Enter	Exit	Total
<b><u>Generation Forecasts:</u></b>				
▪ Sherbeck Field – Academic Instruction <sup>5</sup>				
➤ Students (64 students)	512	64	0	64
➤ Teachers (2 teachers)	16	2	0	2
<b>Total Trip Generation Potential – Academic Instruction</b>	<b>528</b>	<b>66</b>	<b>0</b>	<b>66</b>

<sup>5</sup> The following assumptions were utilized to develop the trip generation for academic instruction.

- Evening classes would begin at 6:00 PM with a maximum of two classes utilizing the field at the same time.
- The class size would range from 24 students to 32 students with 1 teacher. The traffic study assumes 32 students and 1 teacher to provide a conservative forecast.
- The traffic study assumes that all students and the teacher would arrive prior to 6:00 PM during the weekday PM peak hour to provide a conservative forecast.

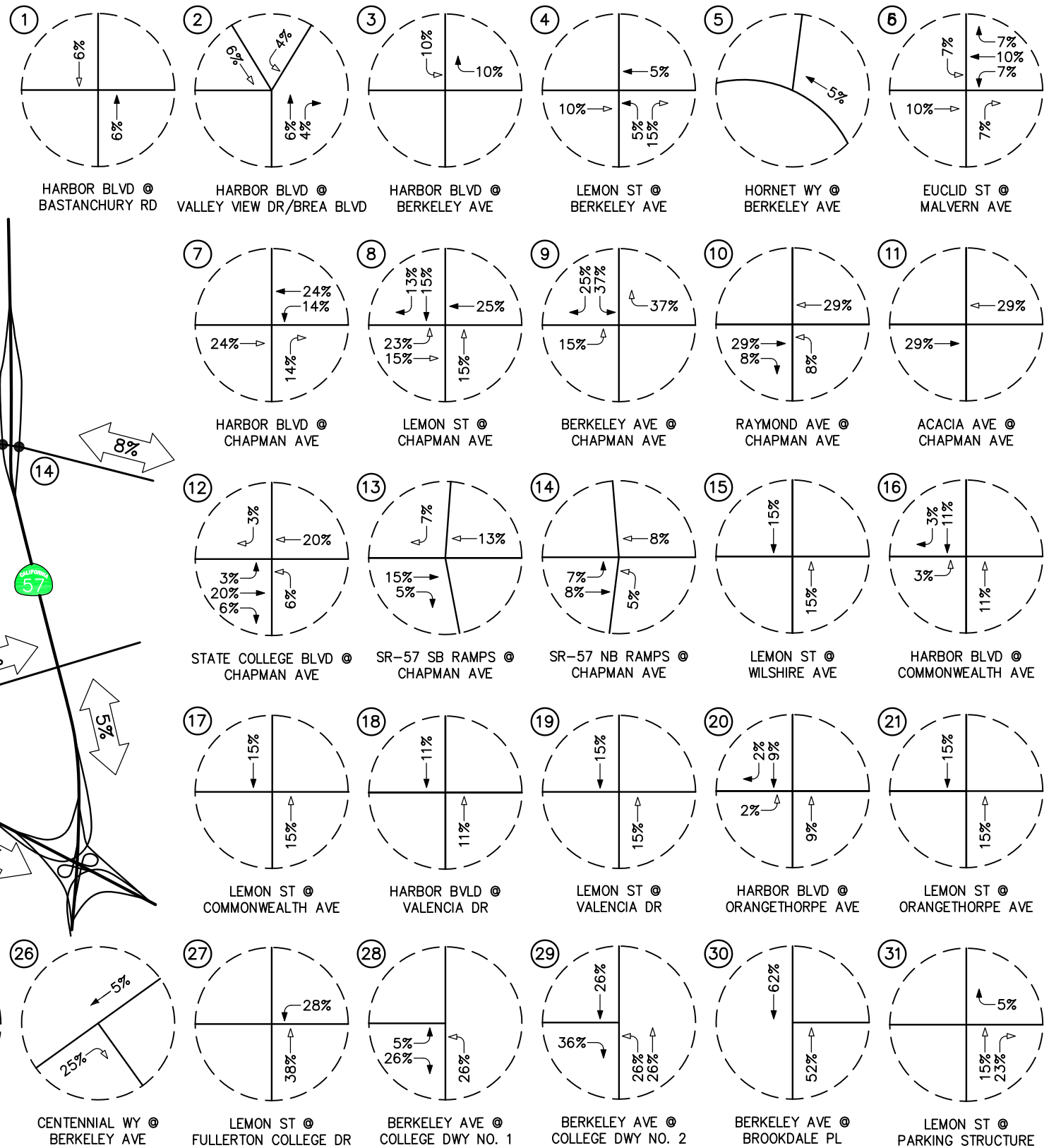
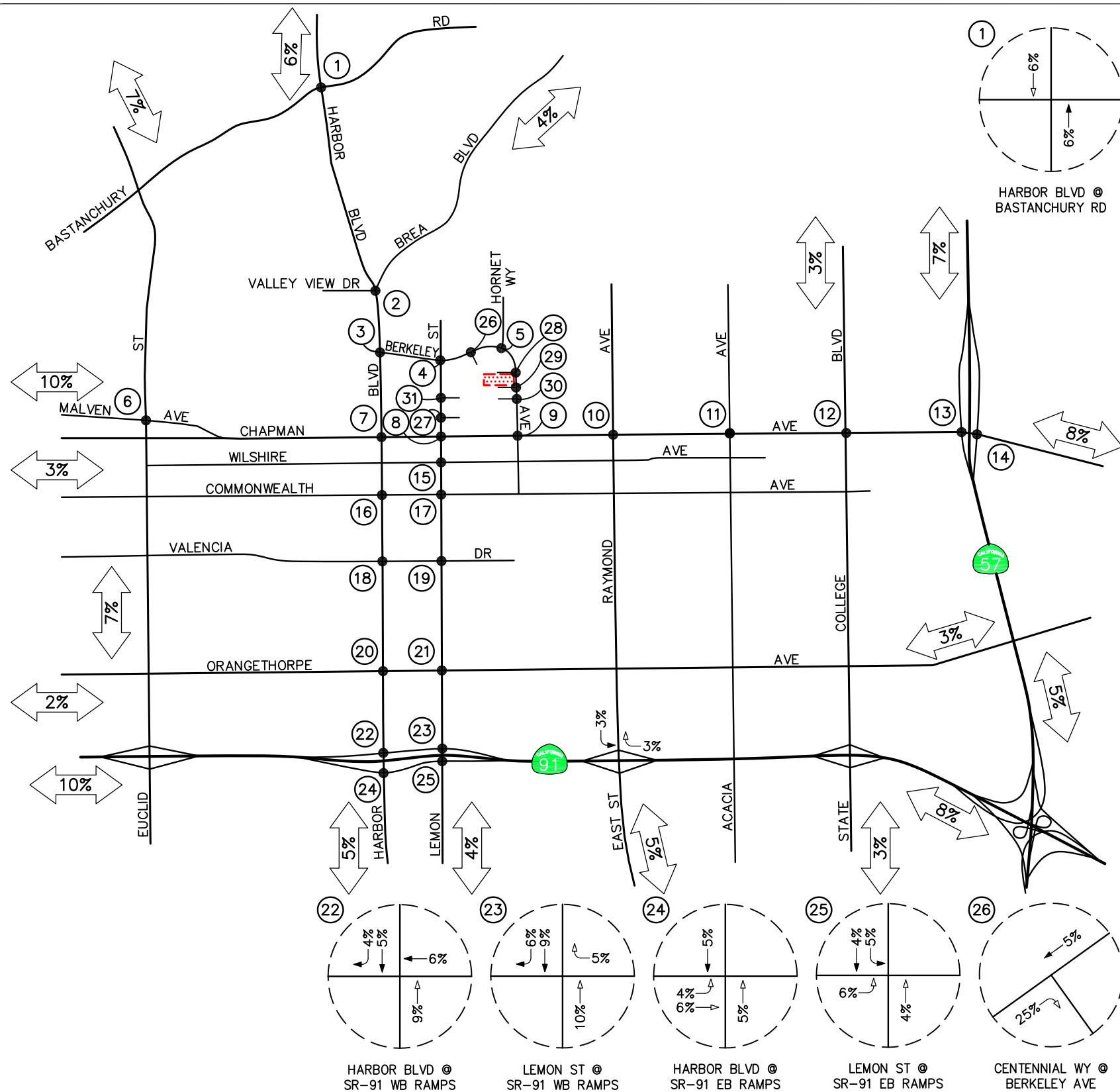
**TABLE 5-2**  
**SATURDAY FIELD EVENT PROJECT TRAFFIC GENERATION FORECAST**

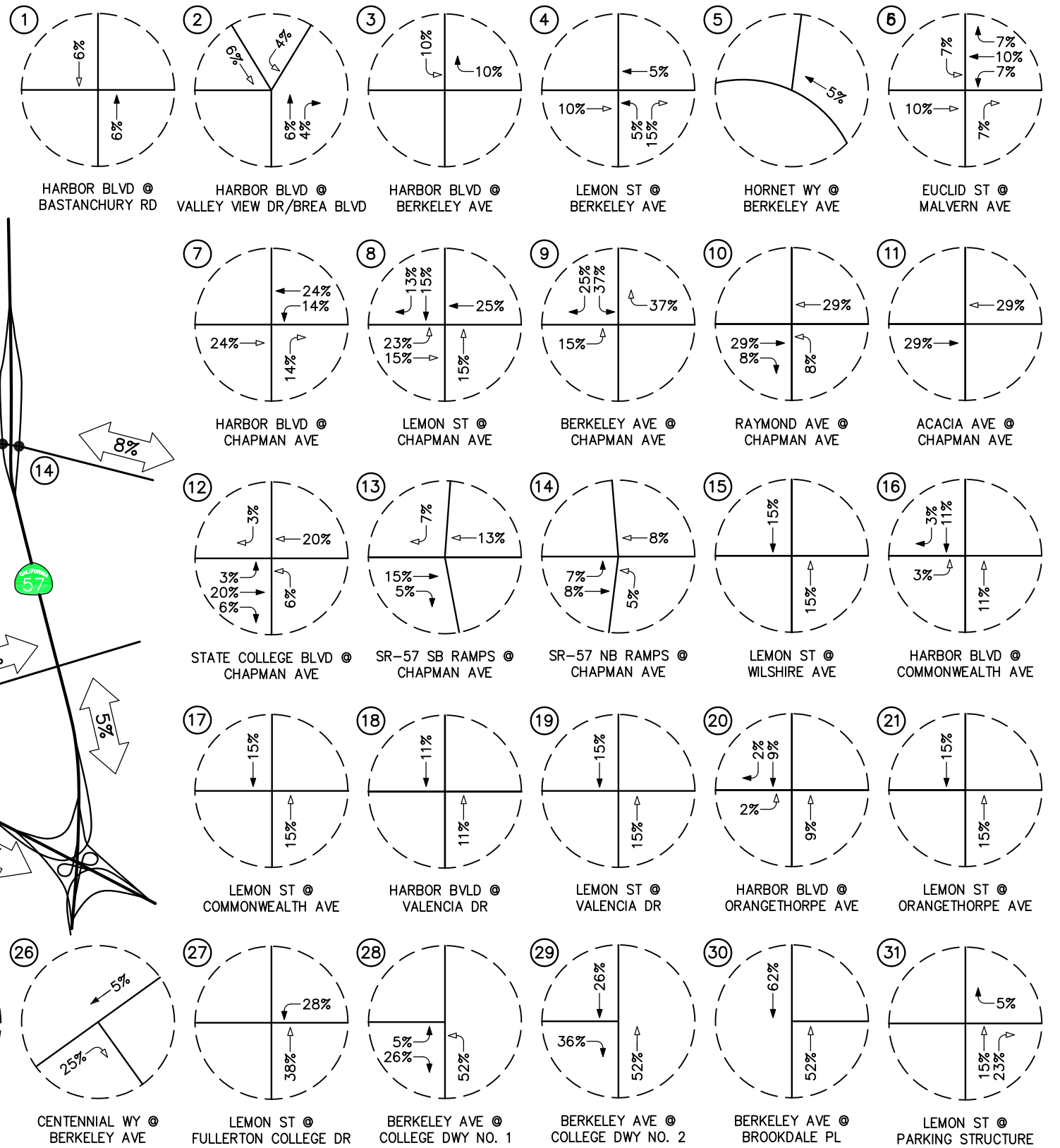
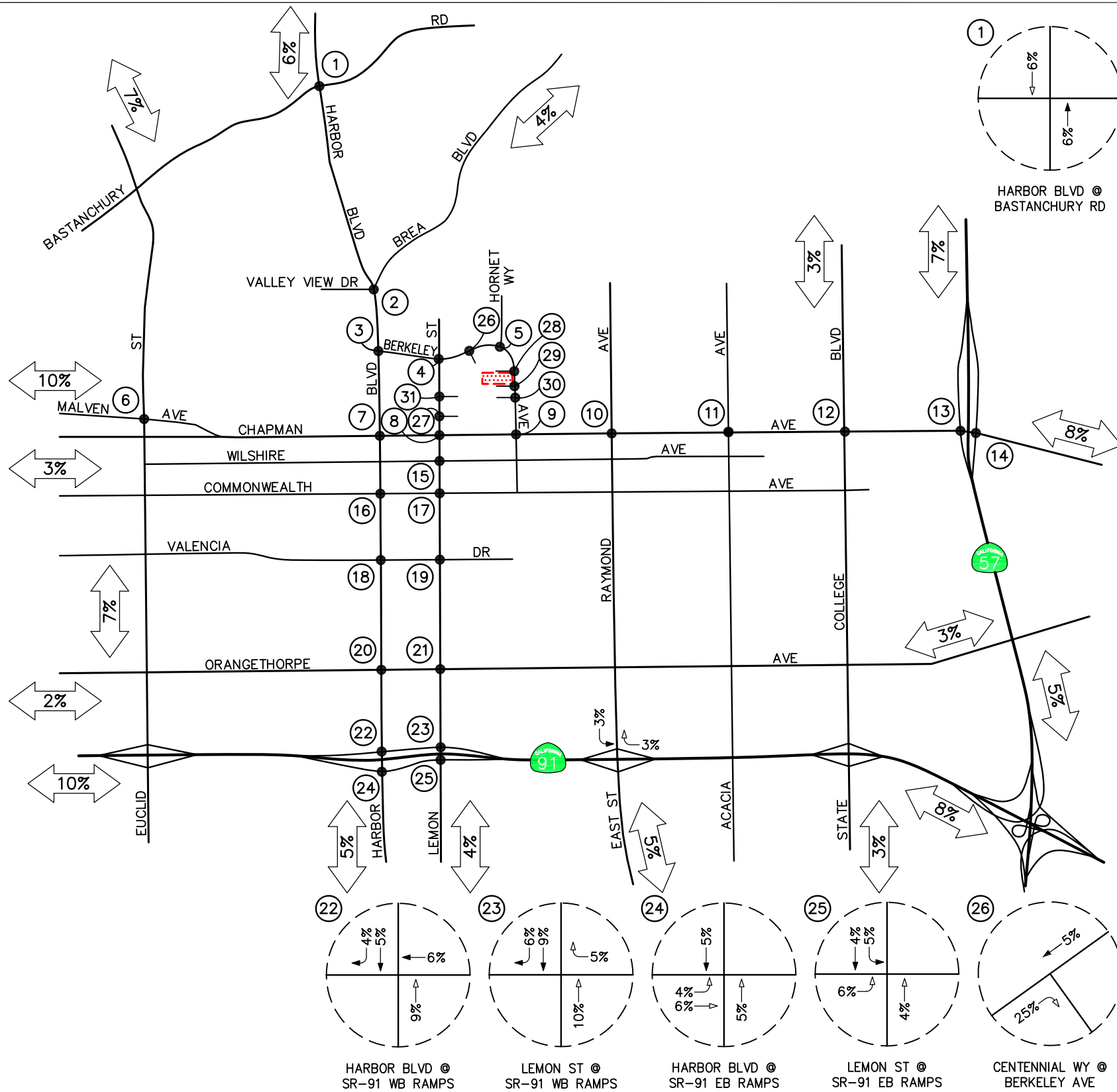
Project Description	Daily 2-Way	Saturday Field Event Arrival Peak Hour			Saturday Field Event Departure Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<b><u>Generation Factors:</u></b>							
▪ Sherbeck Field – Field Event (TE/Occupied Seat) <sup>6</sup>	0.975	0.278	0.075	0.353	0.032	0.346	0.378
<b><u>Generation Forecasts:</u></b>							
▪ Sherbeck Field – Field Event (4,417 Seats)	4,307	1,228	331	1,559	141	1,528	1,669

Notes:

- TE/Seat = Trip ends per seat

<sup>6</sup> The trip generation rates for the field event were developed based on existing Saturday traffic counts/observations conducted at Yorba Linda High School on October 21, 2017 during the Fullerton College football game against Saddleback College, which had an attendance of 1,100 people and a start time of 1:00 PM. Traffic counts/observations were conducted at the three driveways along Bastanchury Road between 11:30 AM and 1:30 PM during the football game's arrival period and between 3:30 PM and 5:30 PM during the football game's departure period in order to determine the trip generation for the field event, which included an adjustment to the traffic counts to eliminate any non-football game related traffic at the high school during the arrival and departure periods. The Saturday traffic counts indicated that the Fullerton College football game generated 1,072 daily trips, 388 trips during the arrival peak hour (306 inbound and 82 outbound) and 416 trips during the departure peak hour (35 inbound and 381 outbound). The aforementioned trips were then divided by the game attendance (i.e. 1,100 people) to determine the Saturday daily, Saturday Arrival peak hour and Saturday Departure peak hour trip rates per seat specific to a Fullerton College football game.

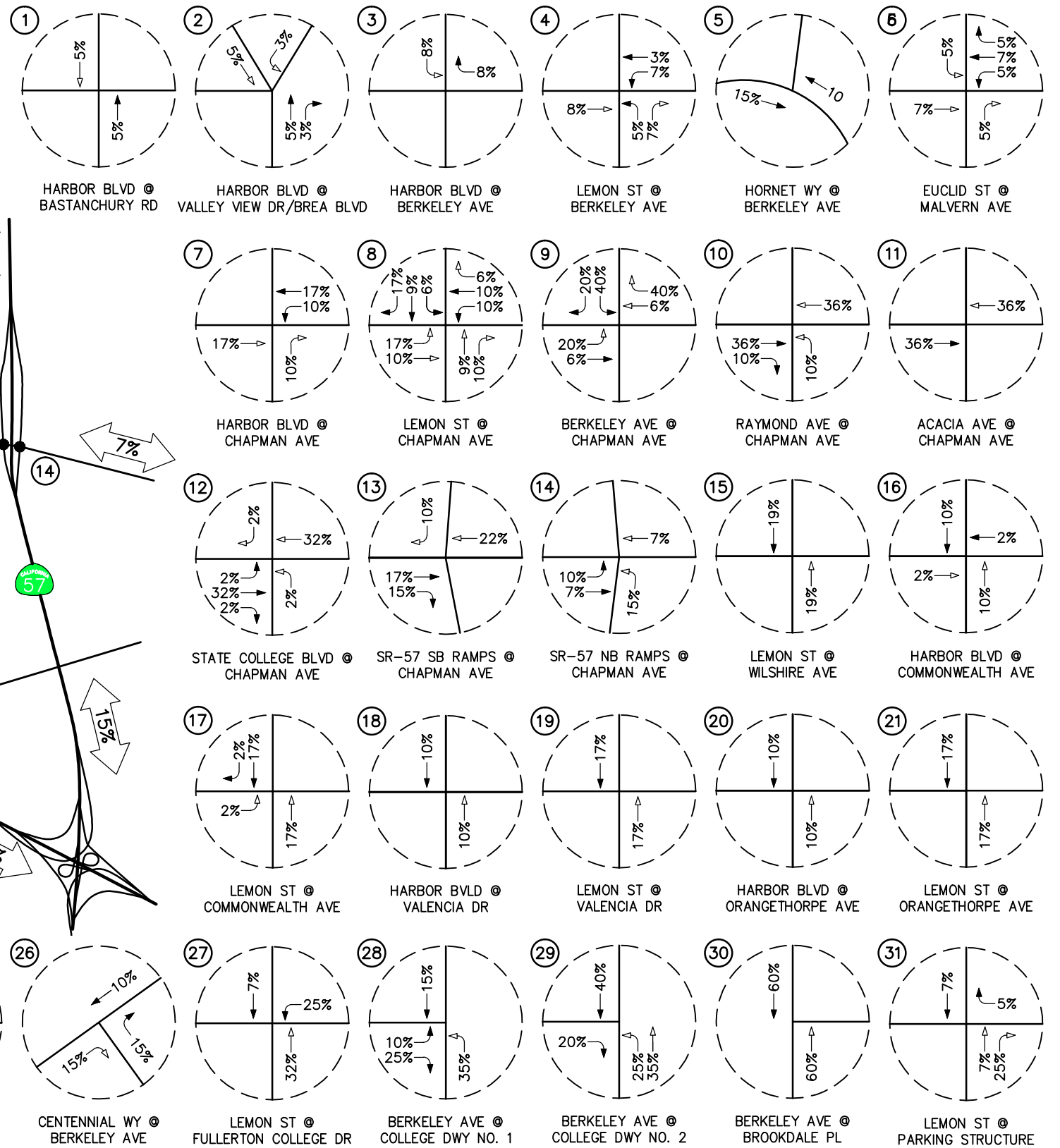
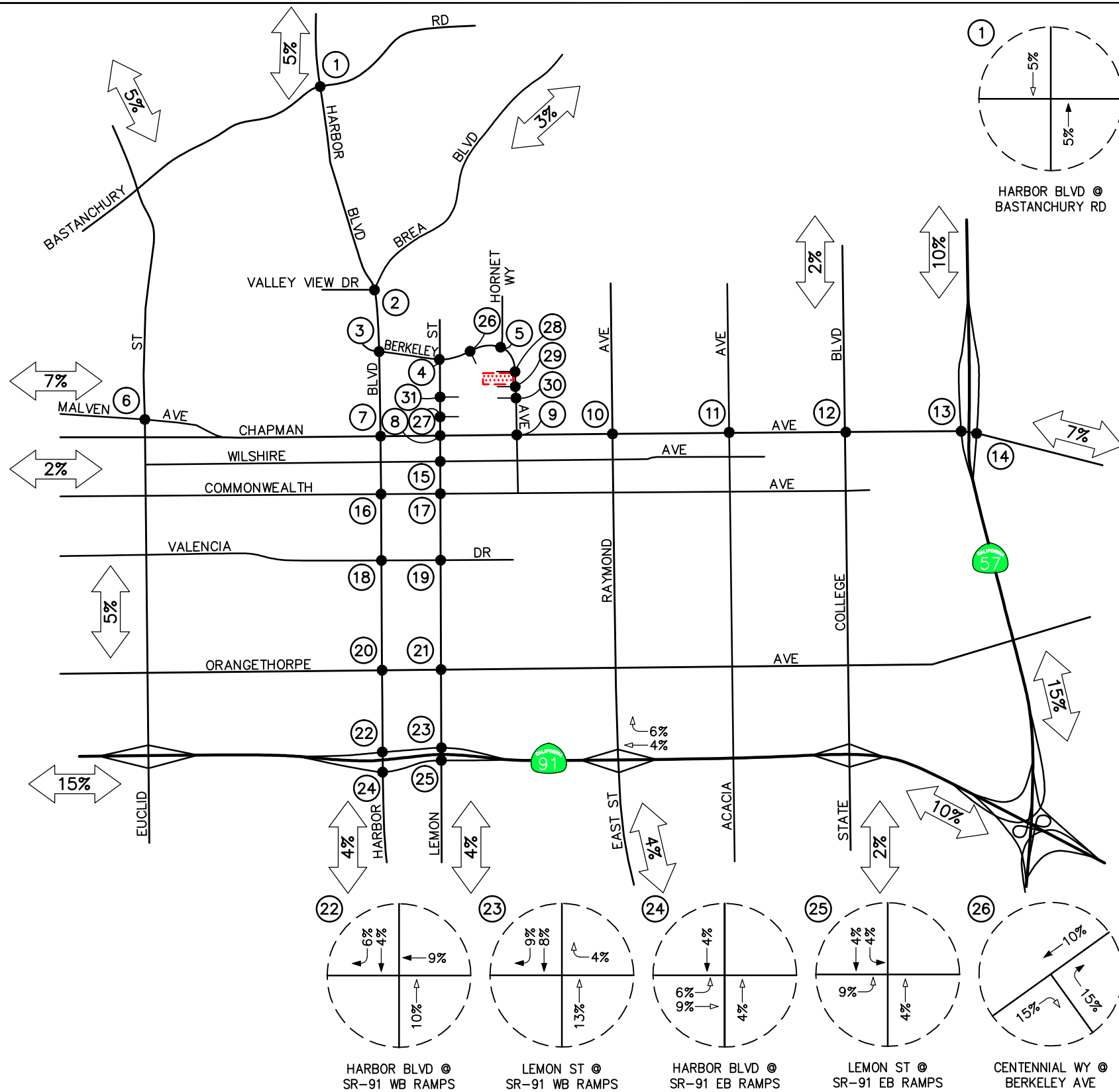




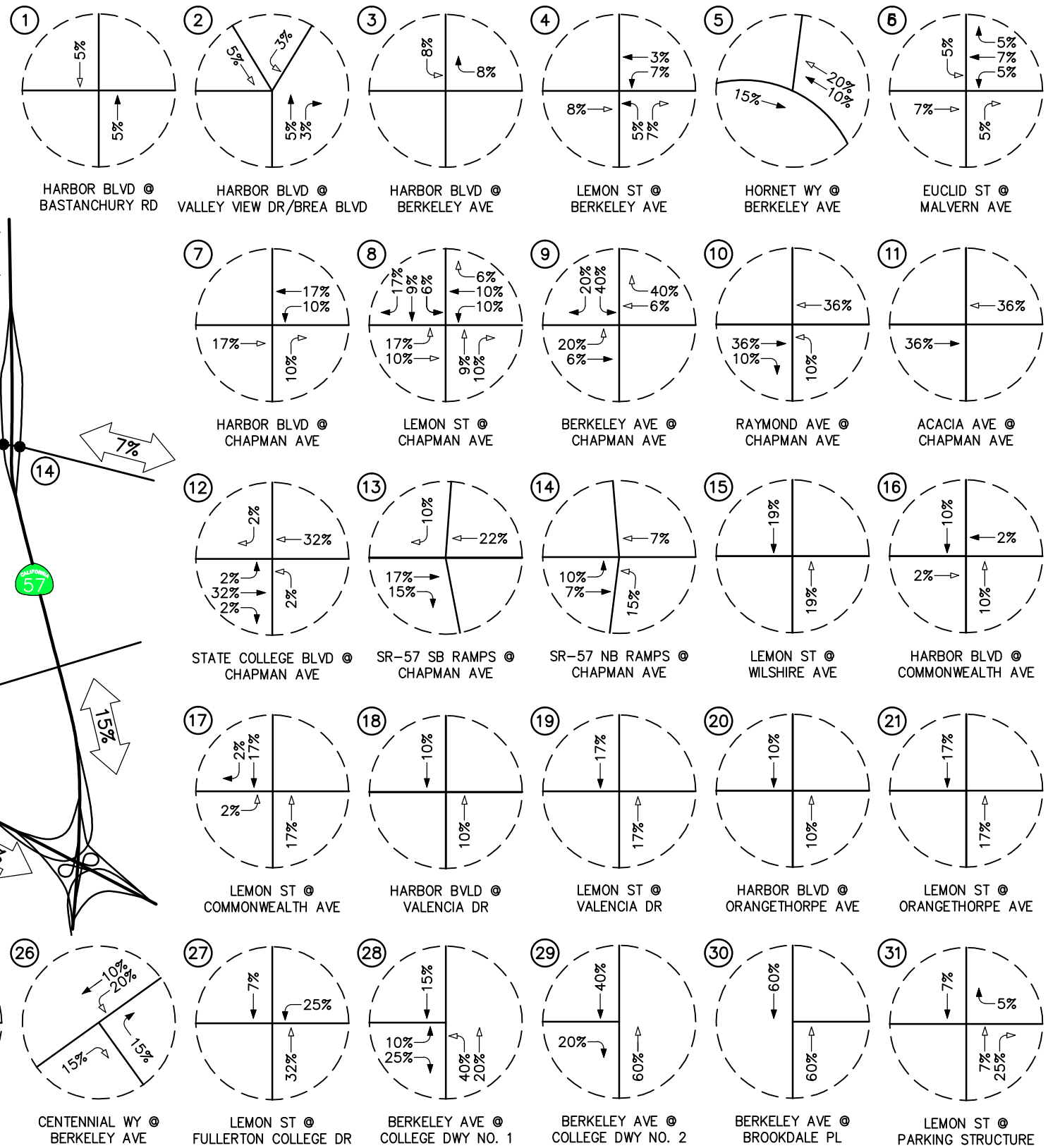
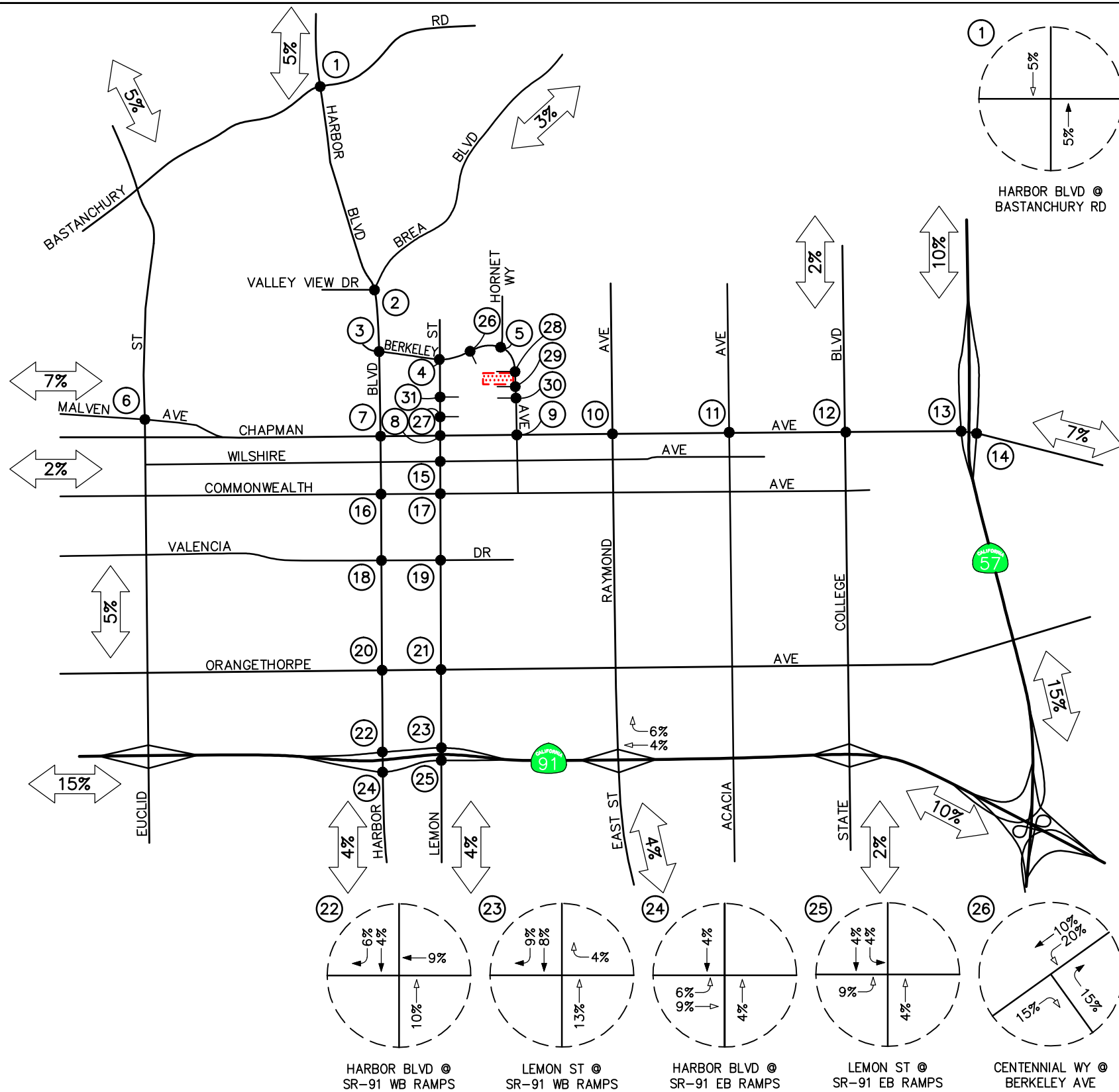
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 ↗ = INBOUND PERCENTAGE  
 ↖ = OUTBOUND PERCENTAGE  
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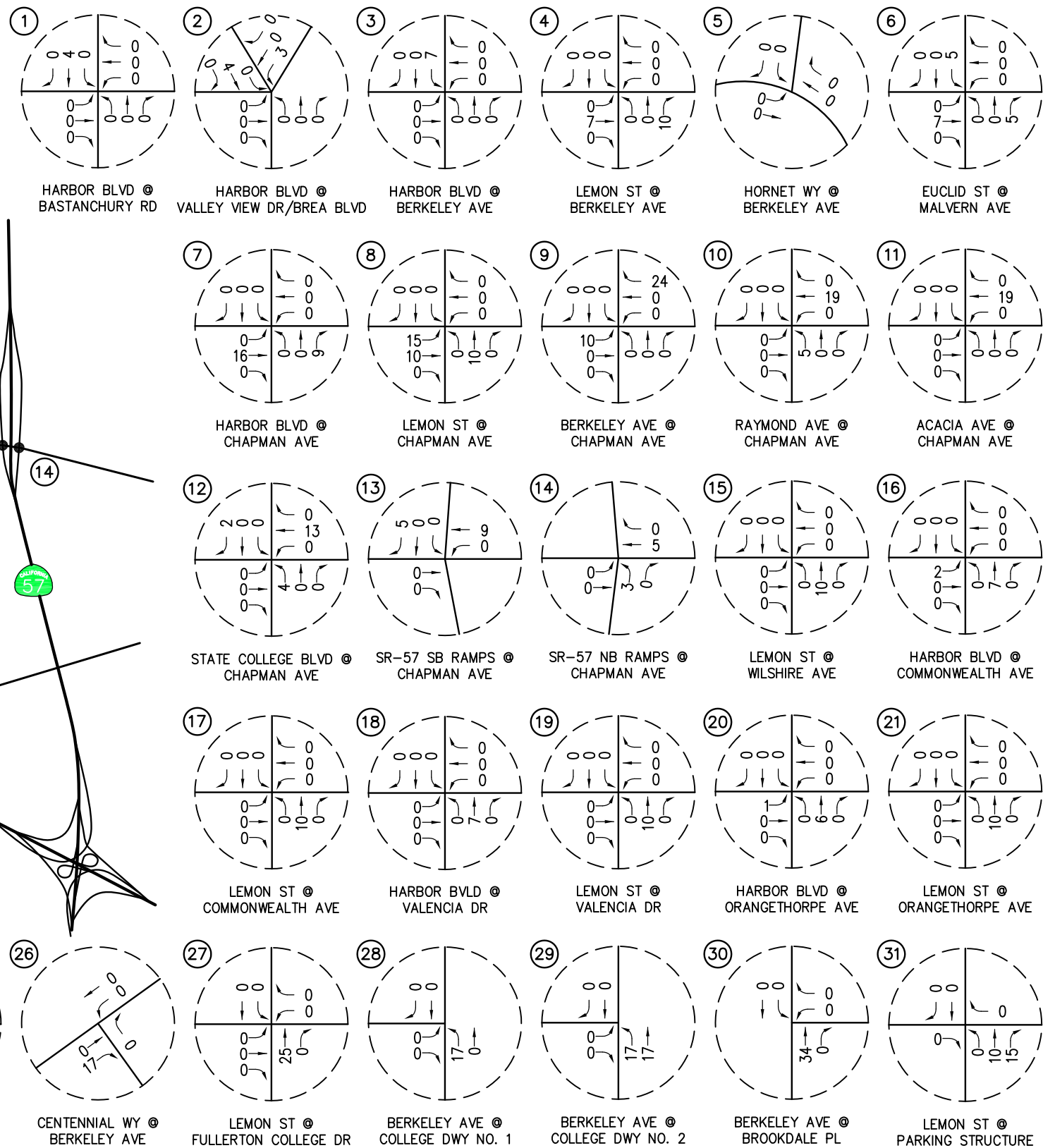
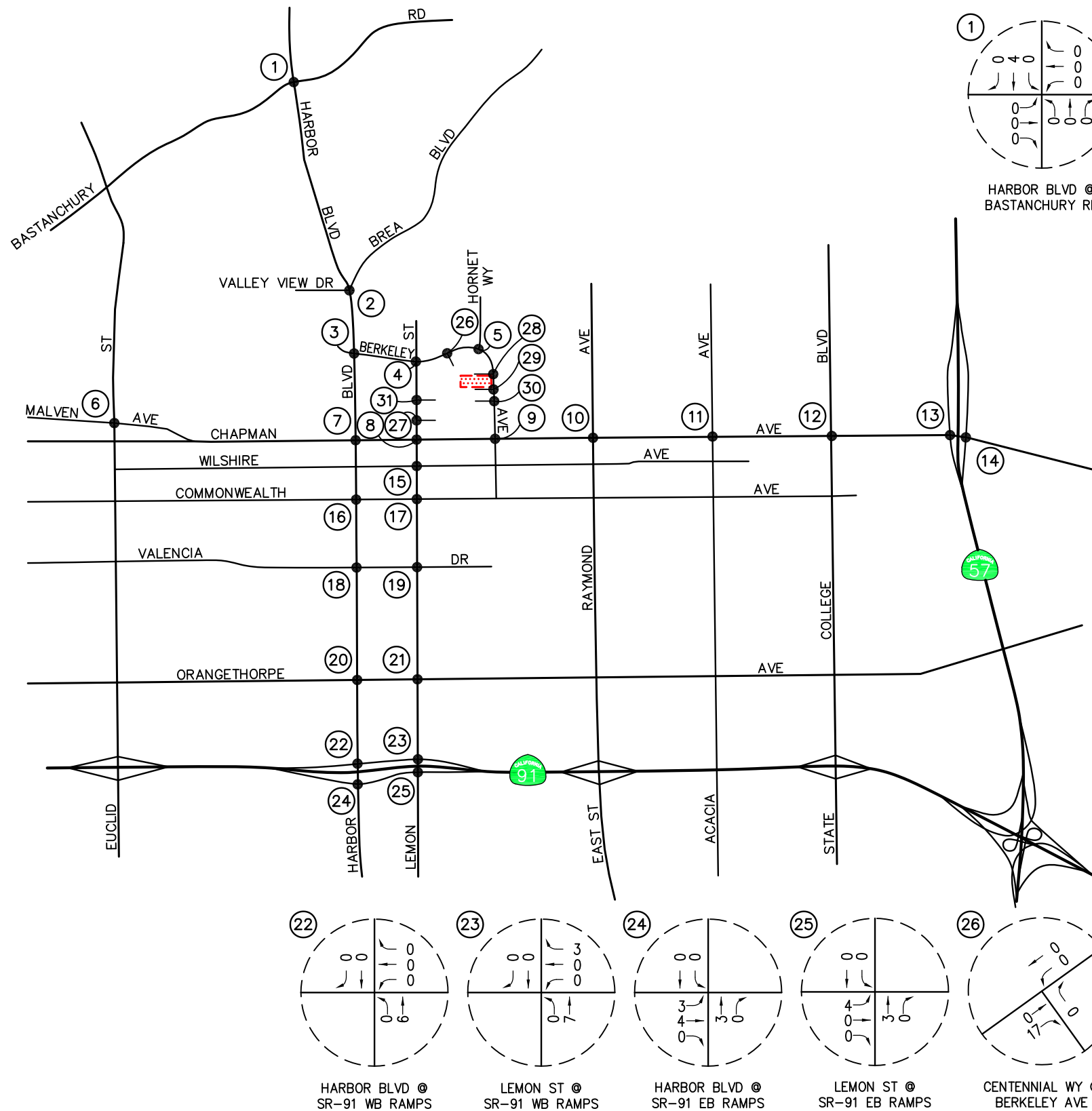
**FIGURE 5-2**  
 YEAR 2030 PROJECT TRAFFIC DISTRIBUTION PATTERN –  
 ACADEMIC INSTRUCTION  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON

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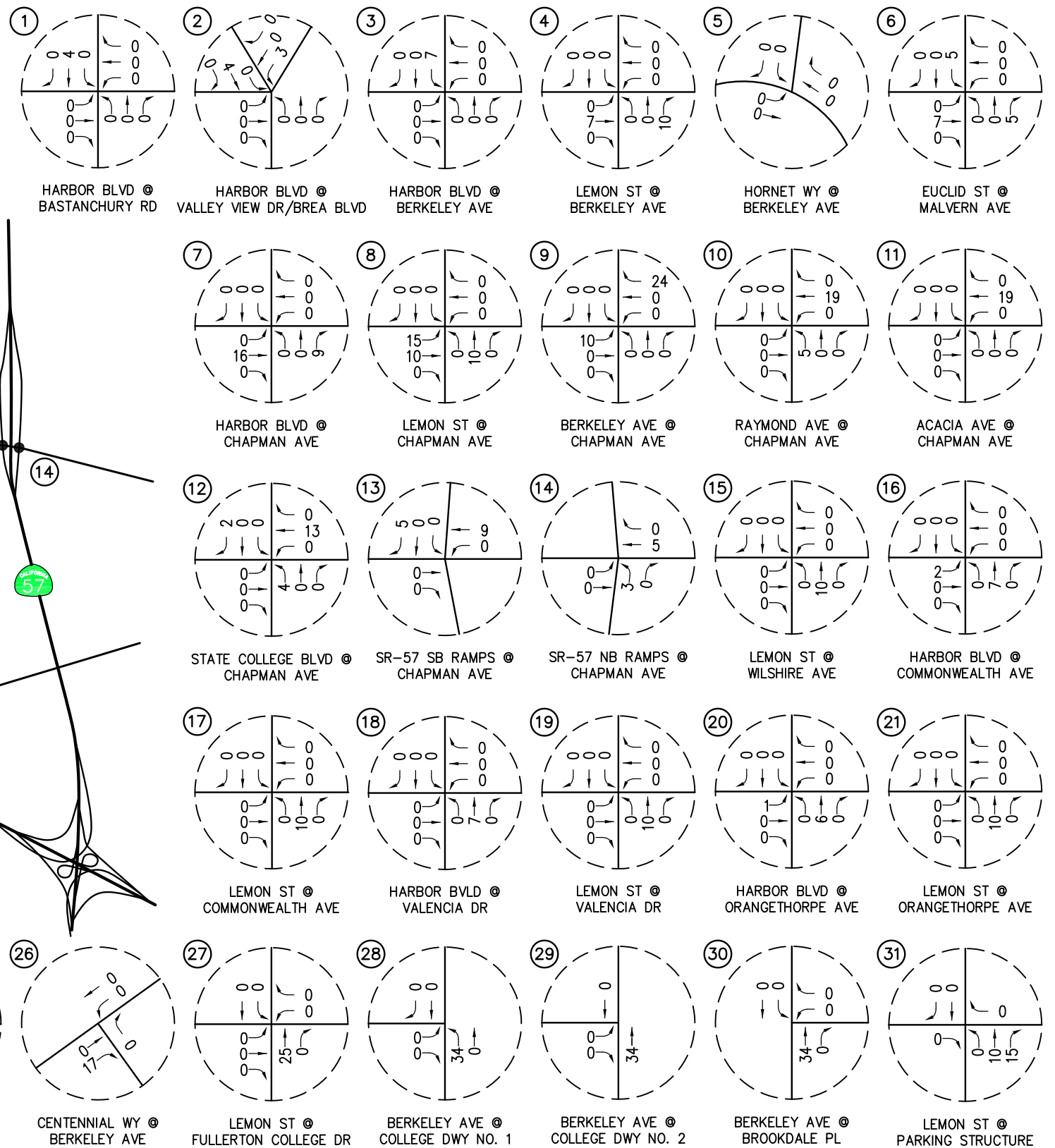
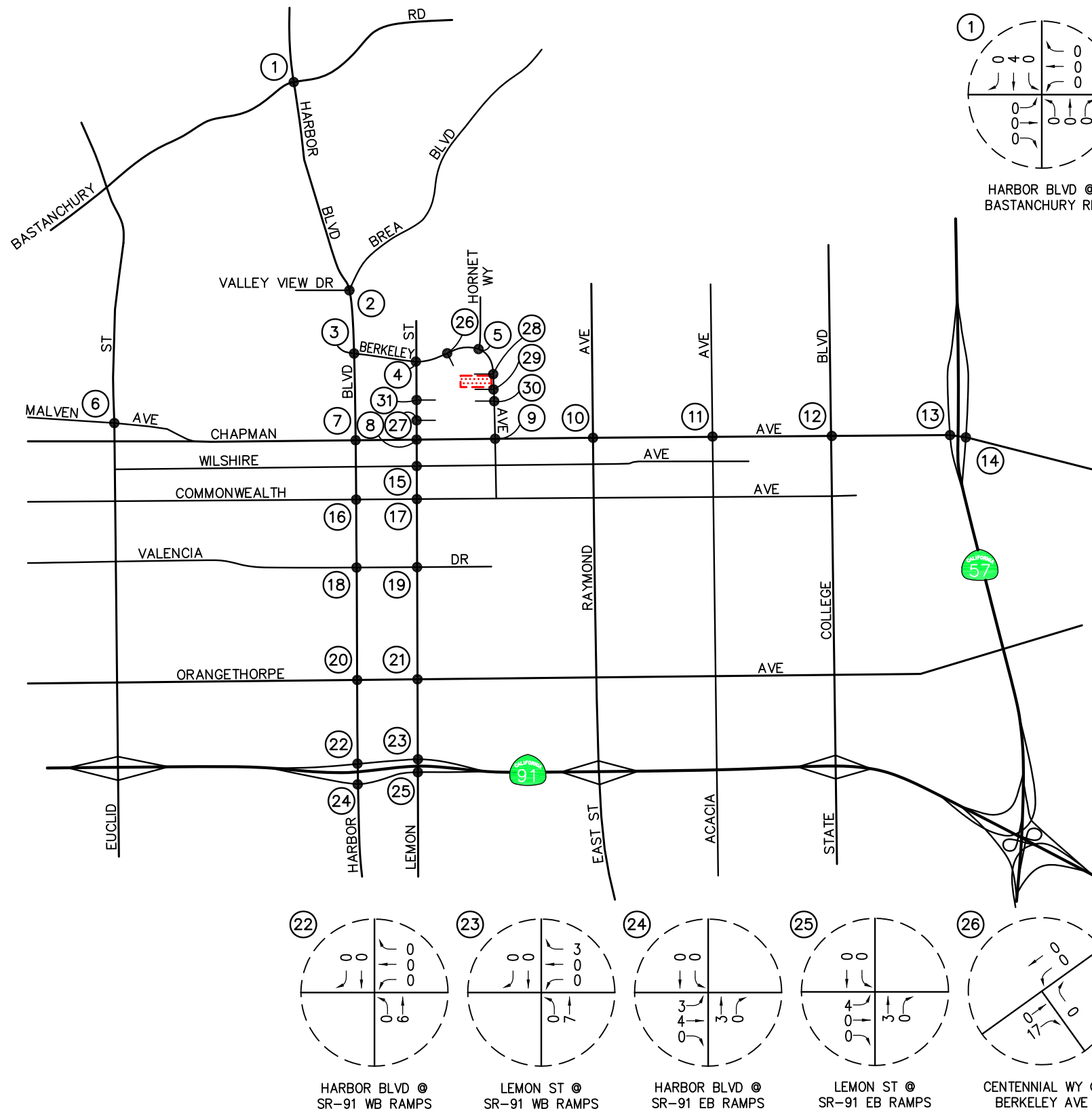


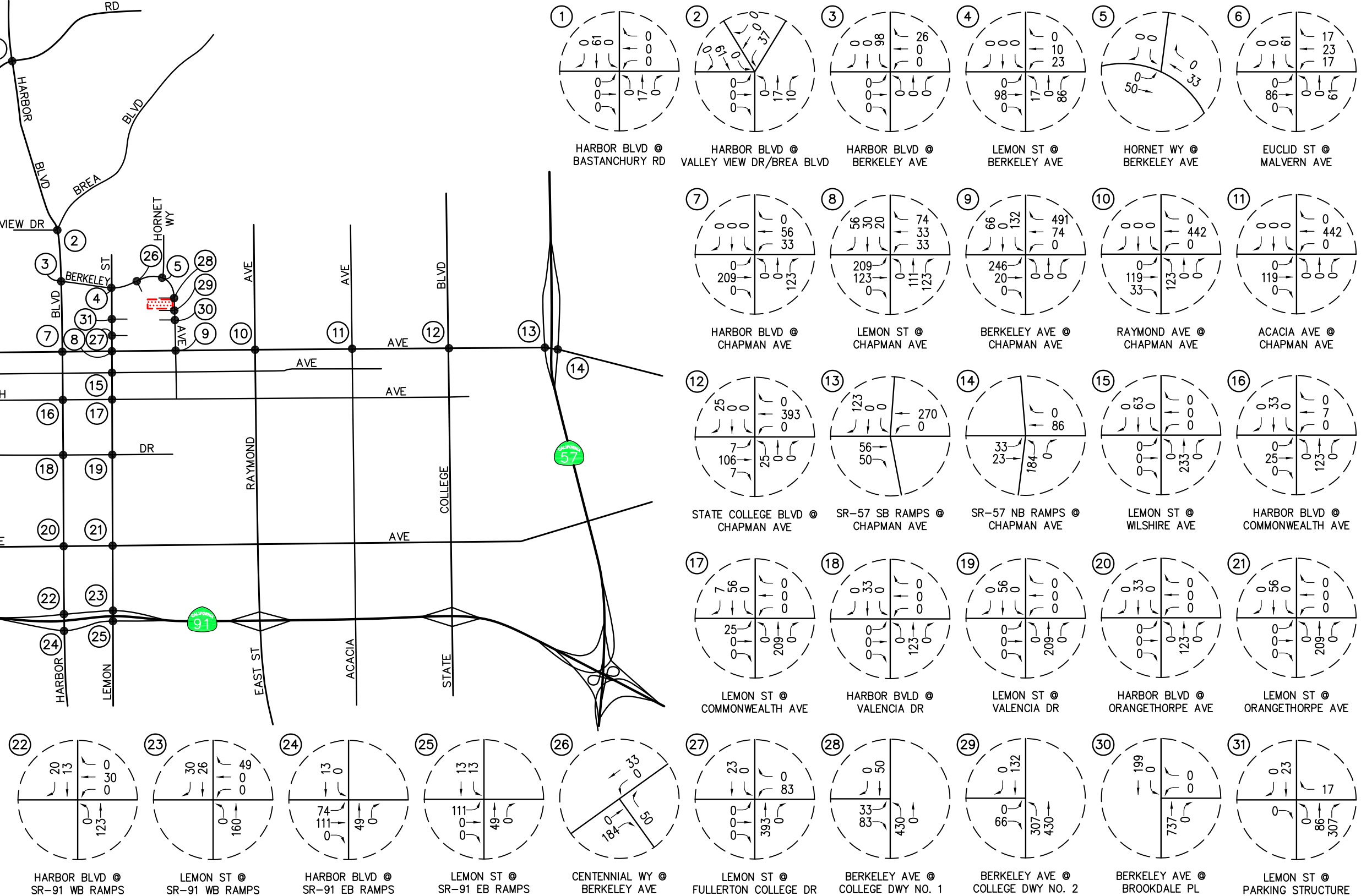
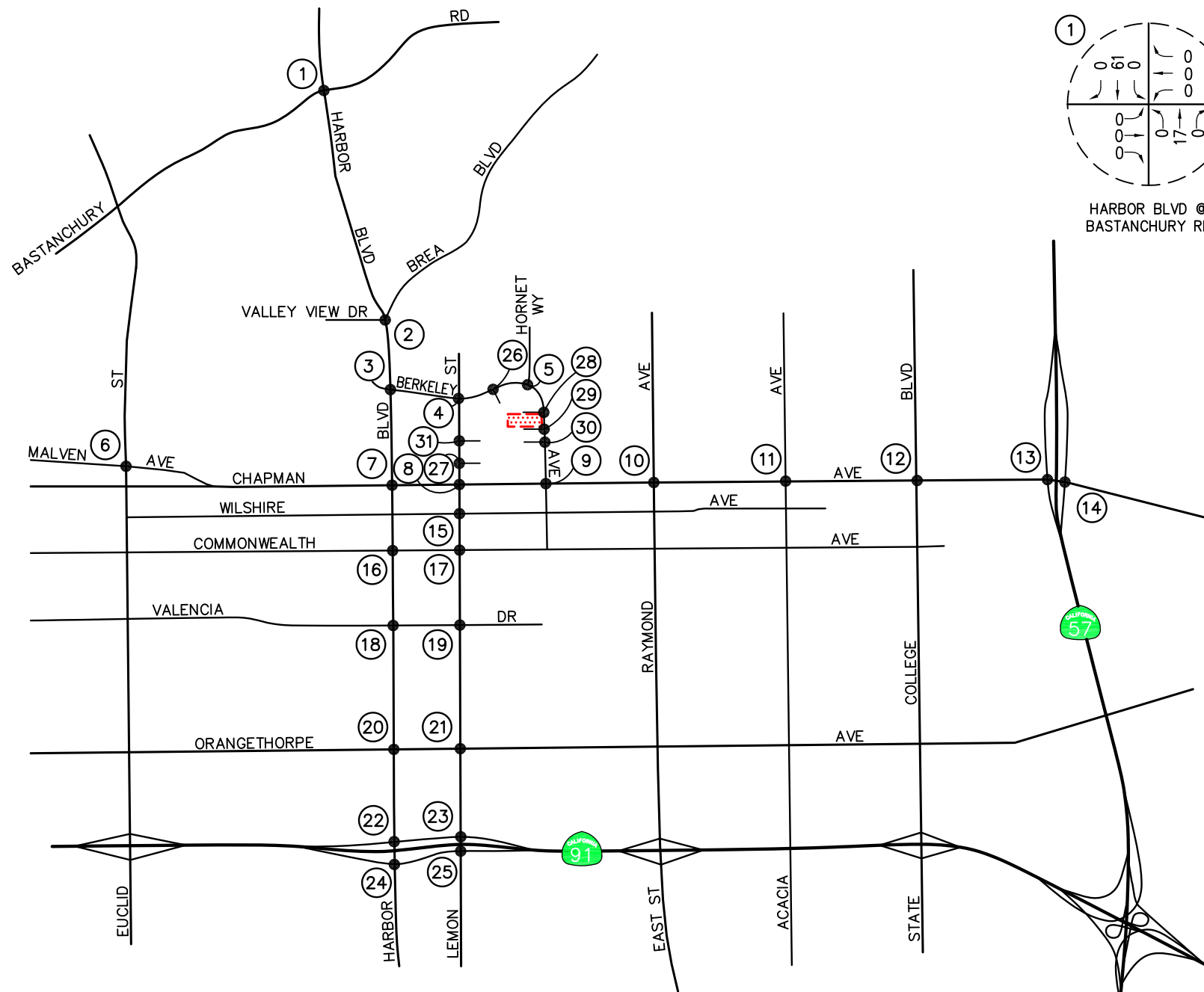


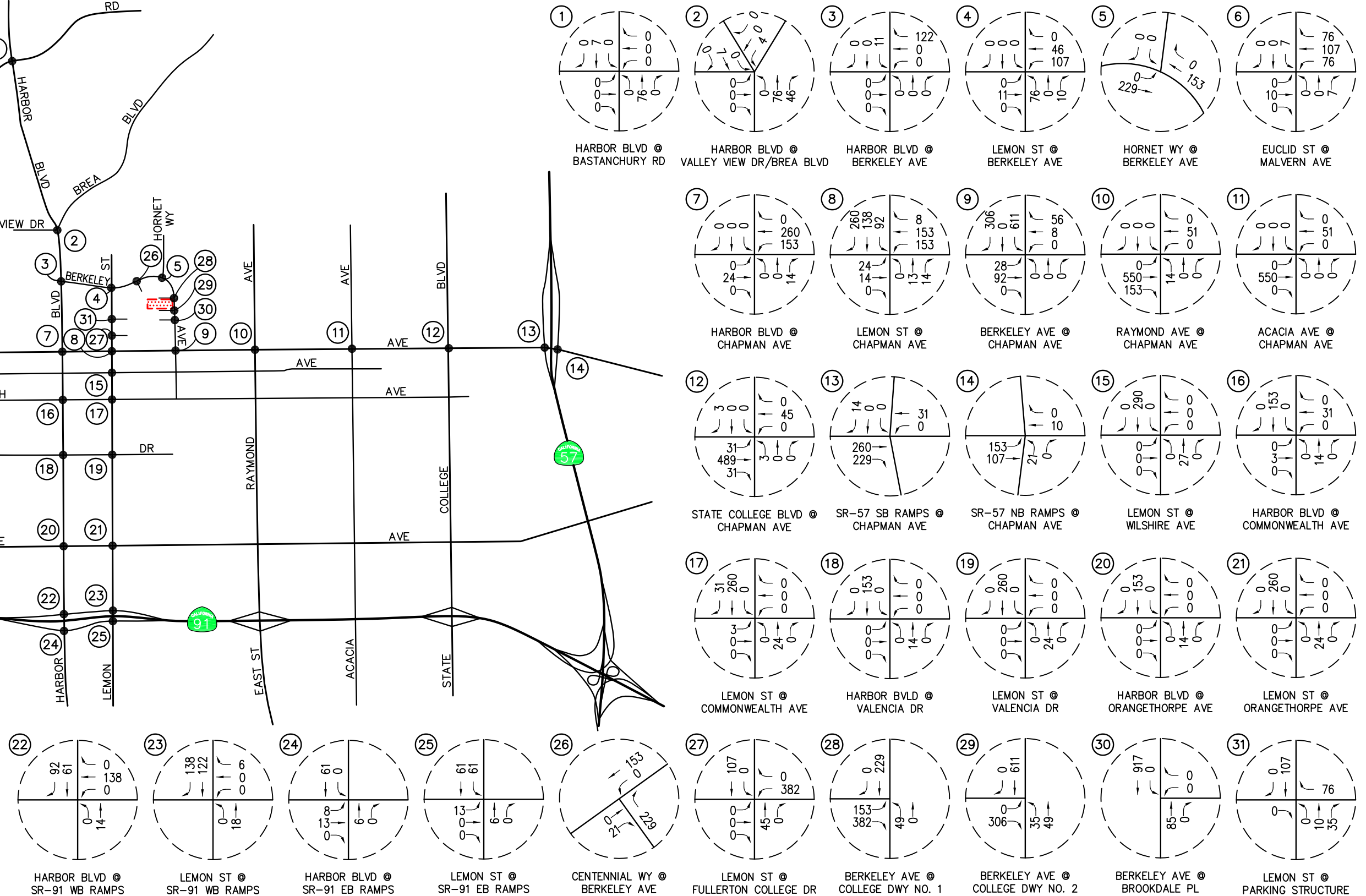
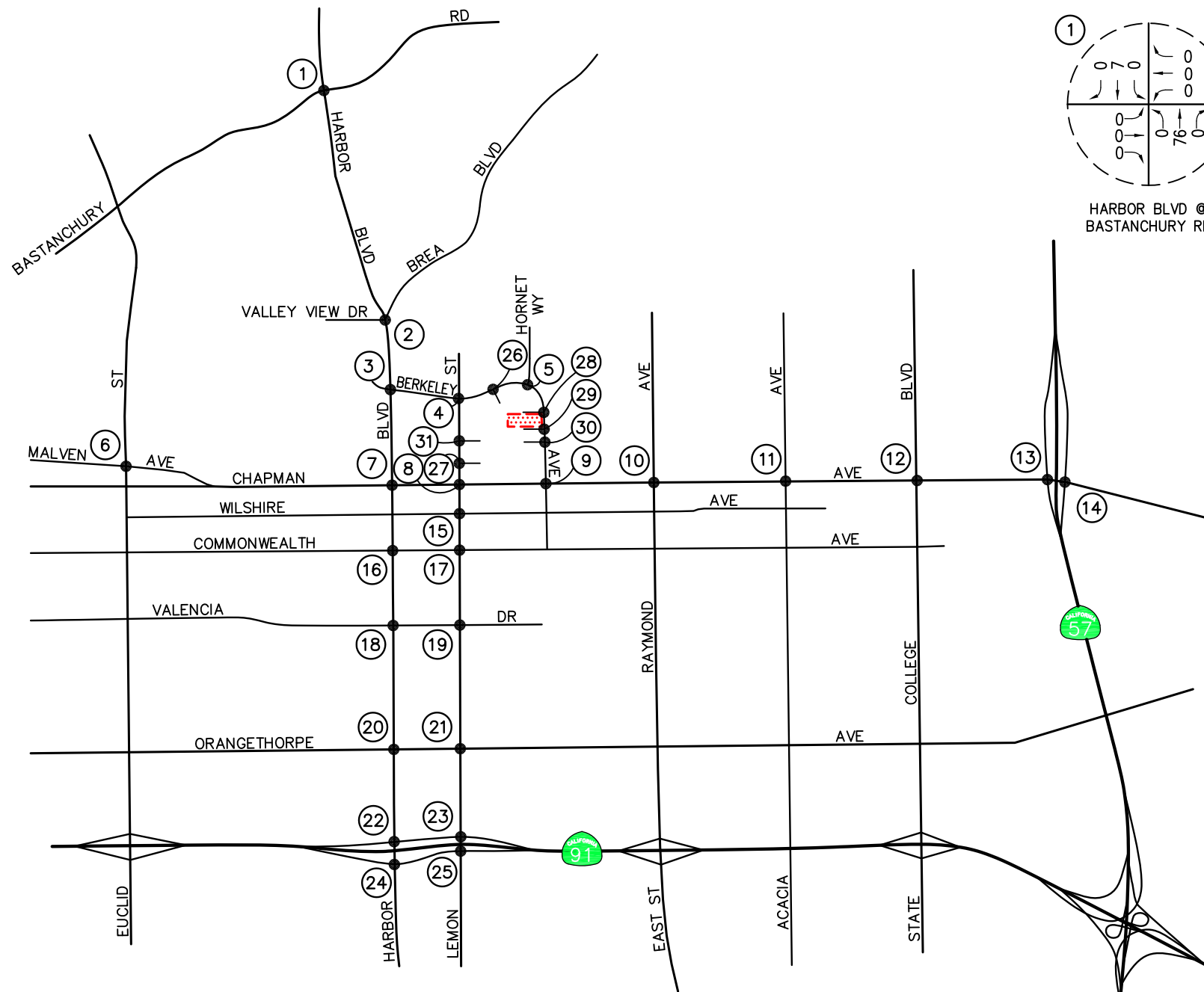




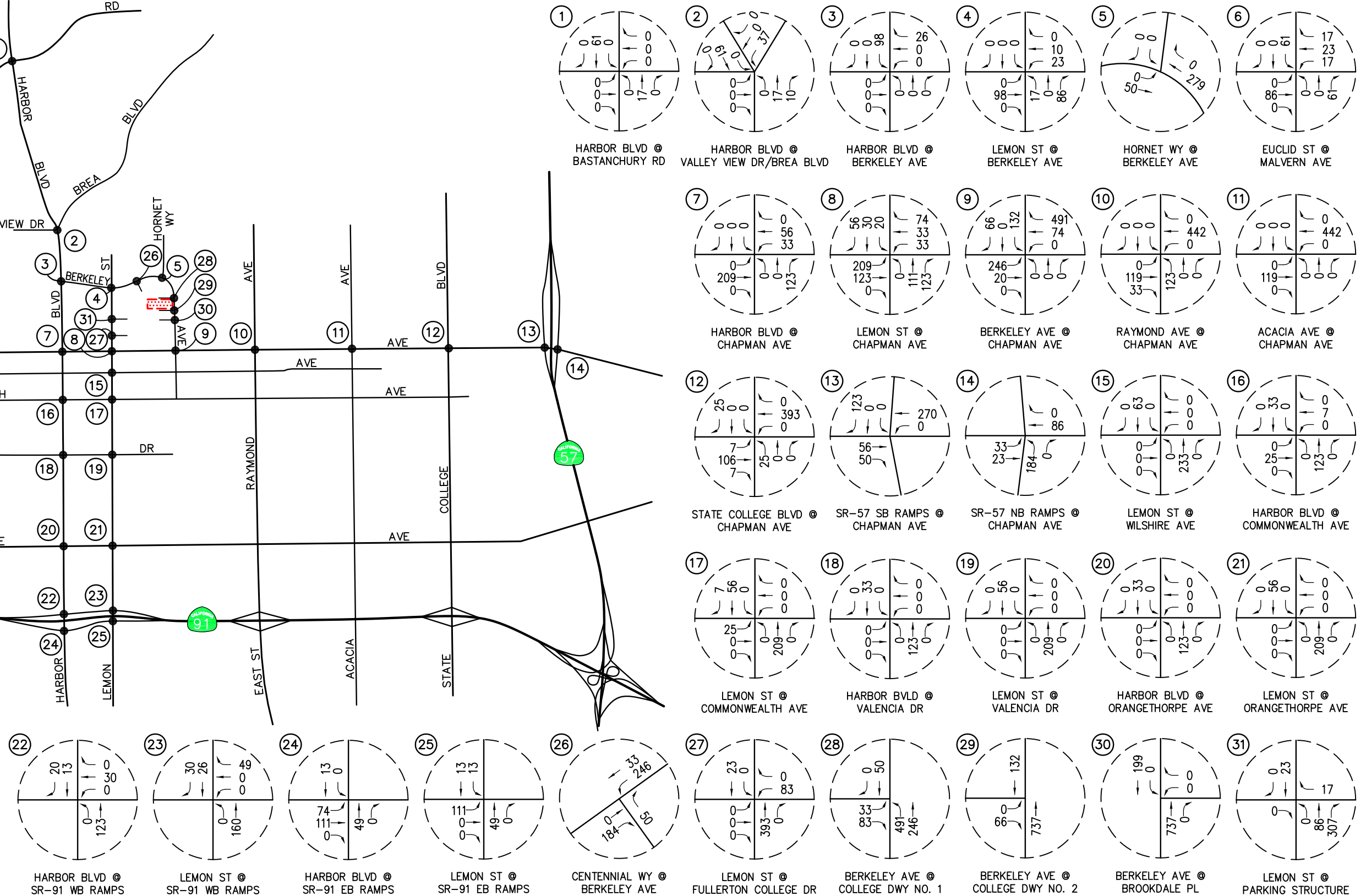
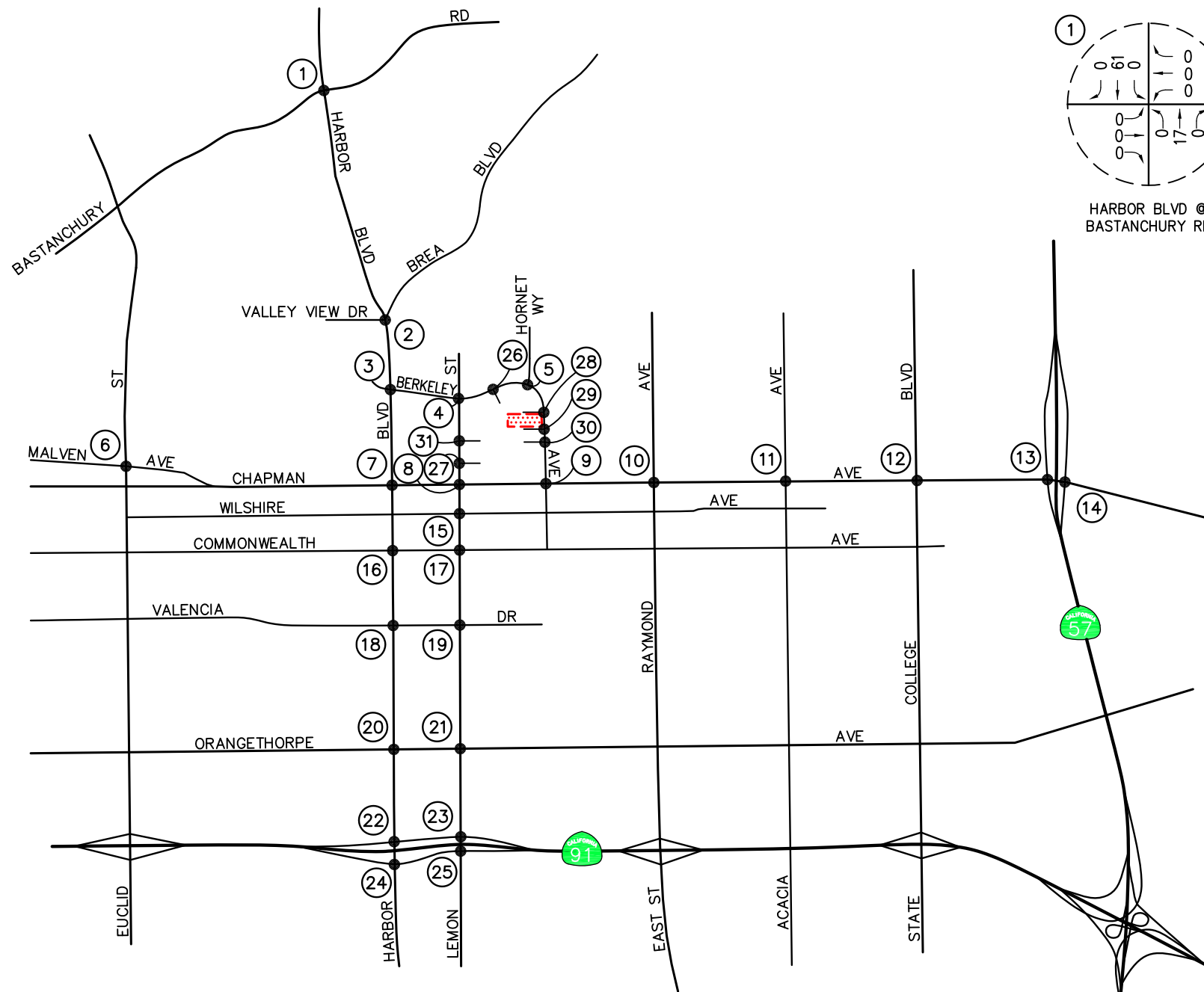


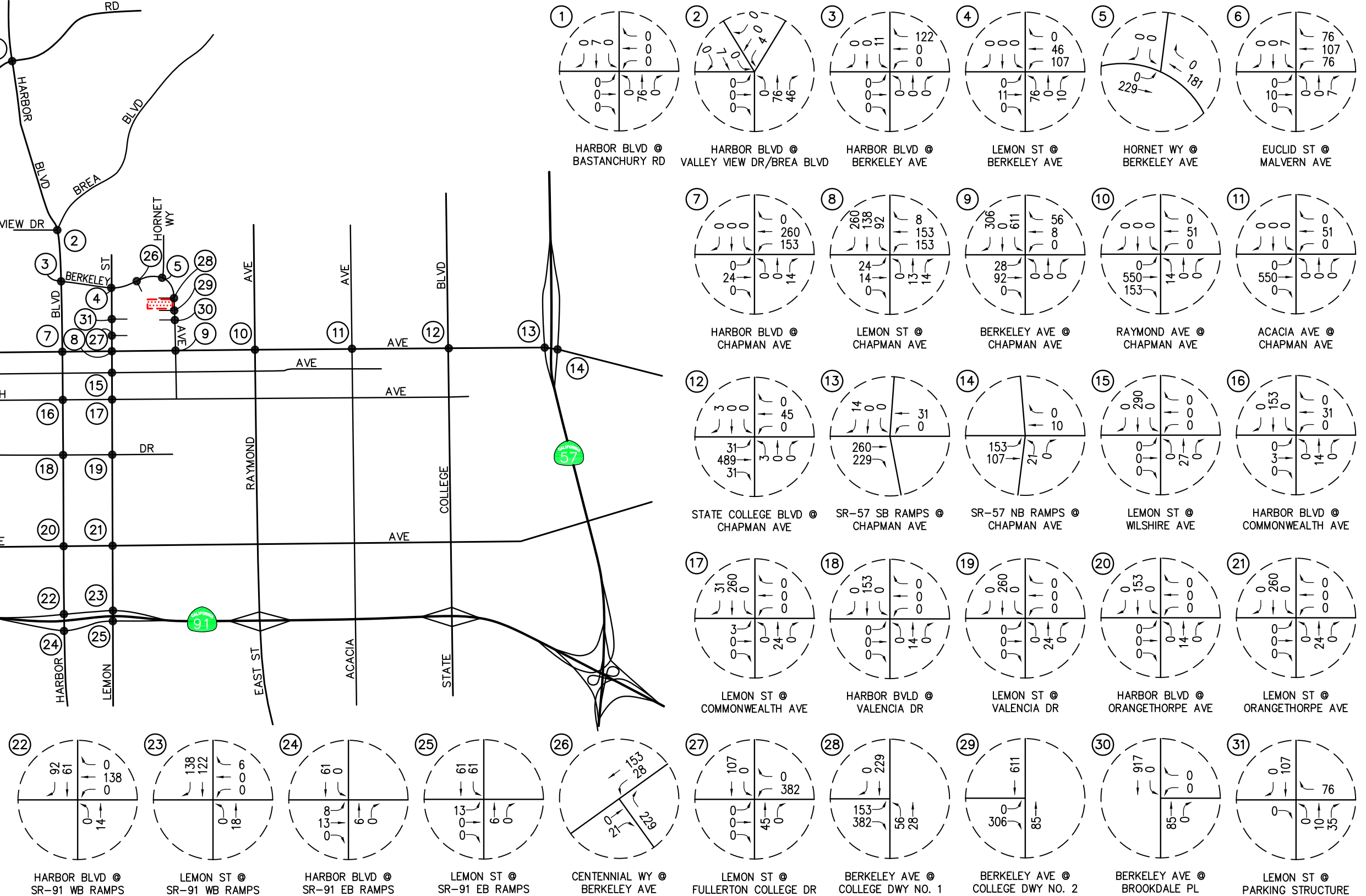
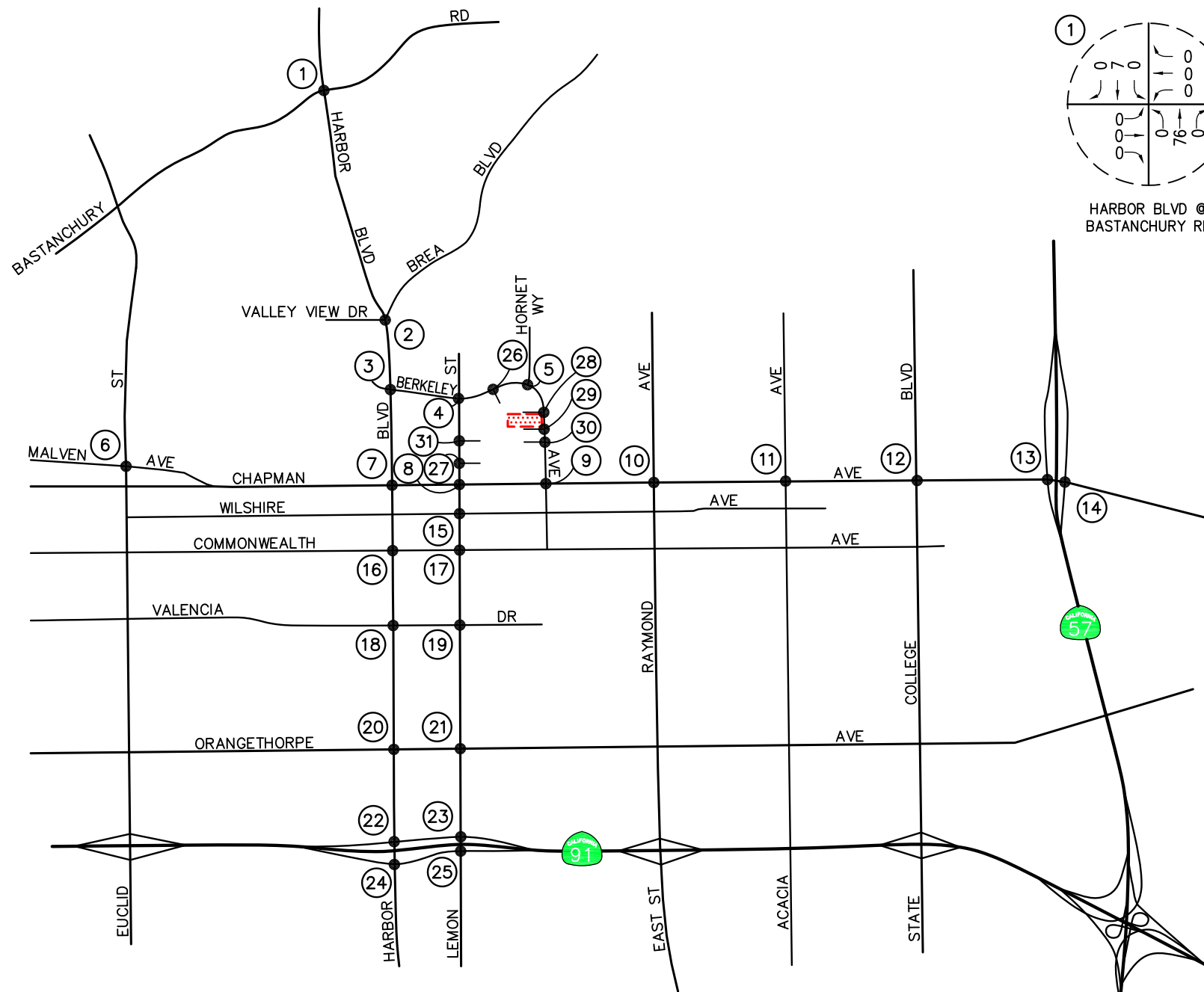


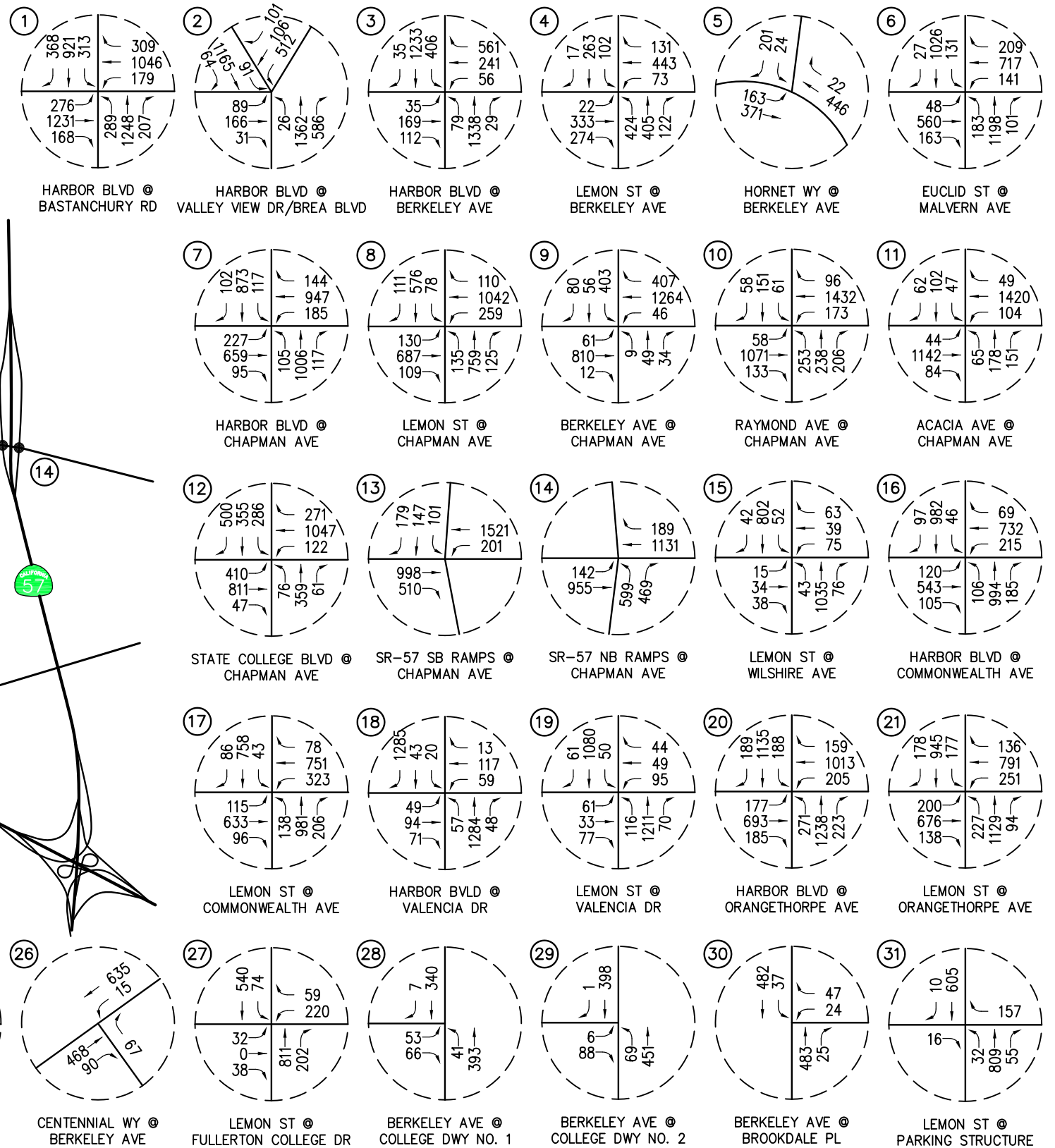
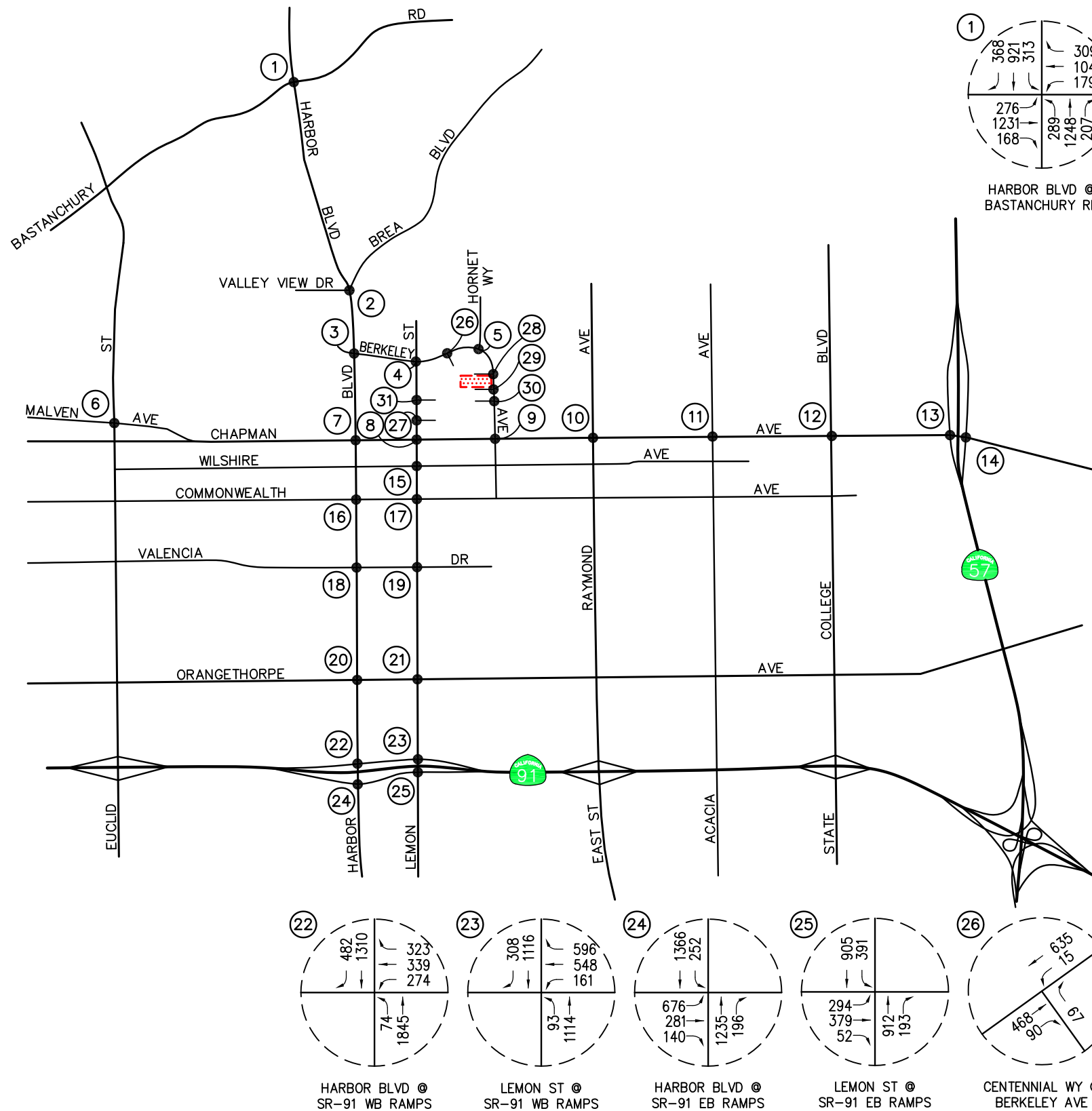




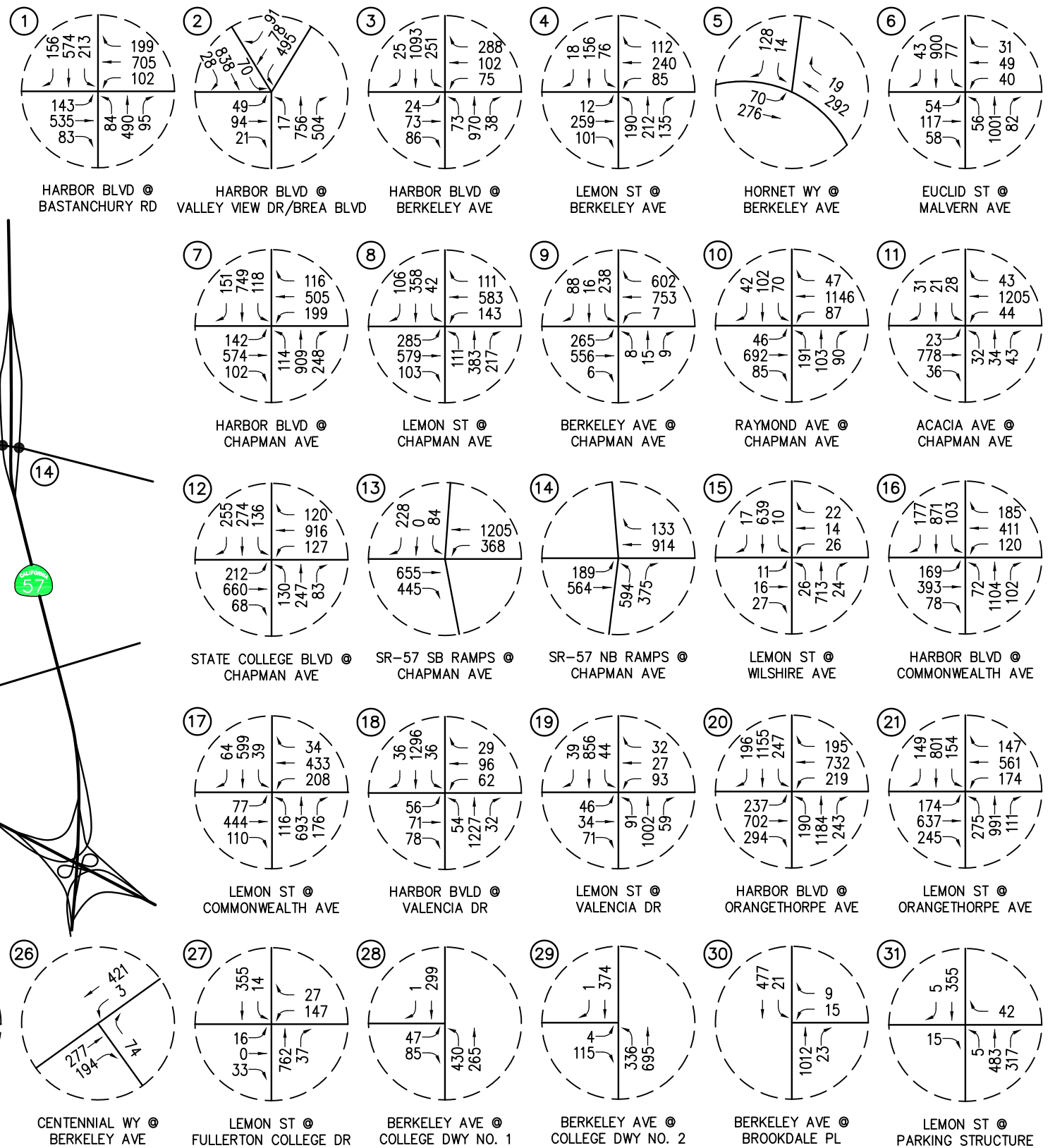
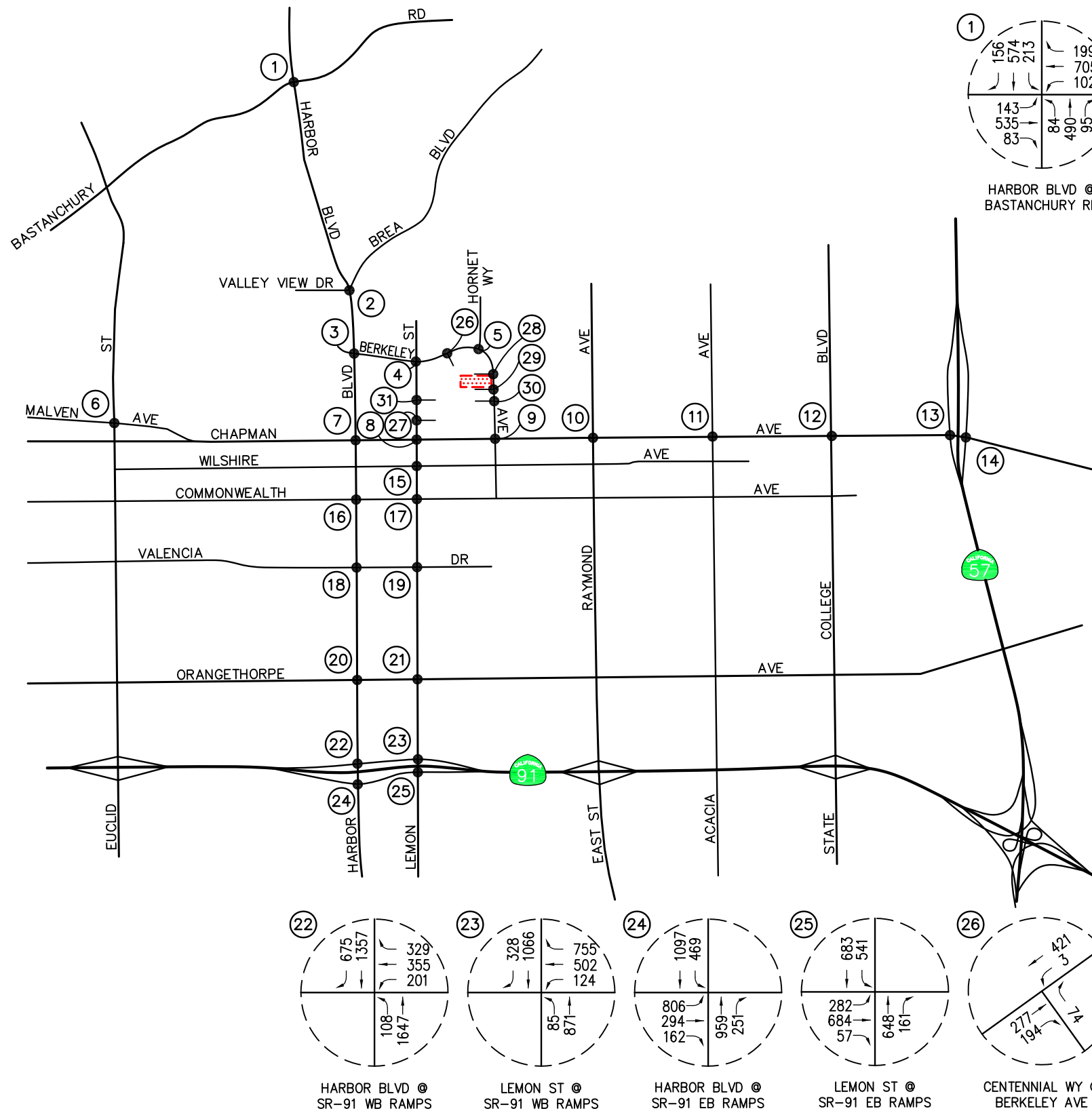


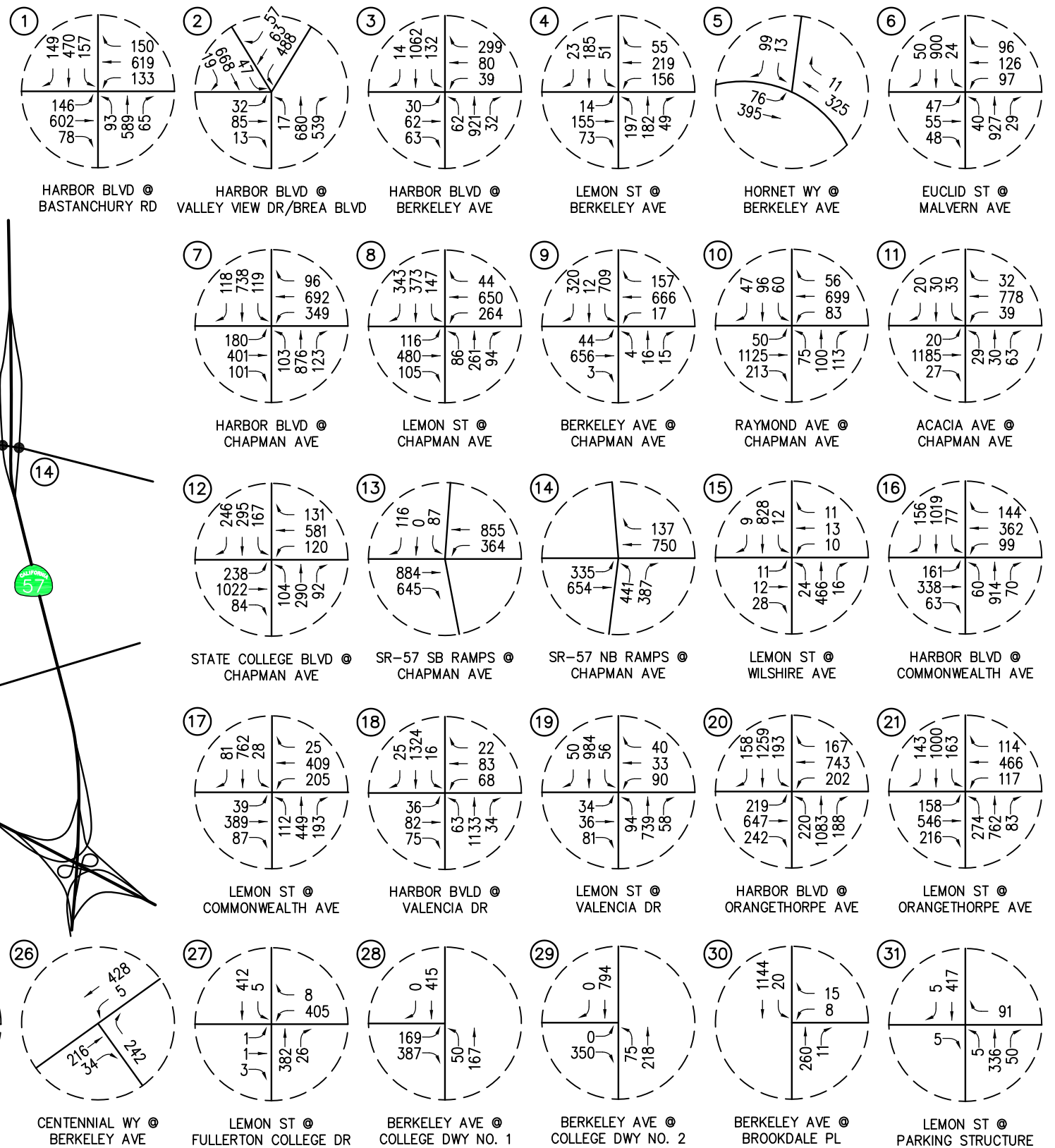
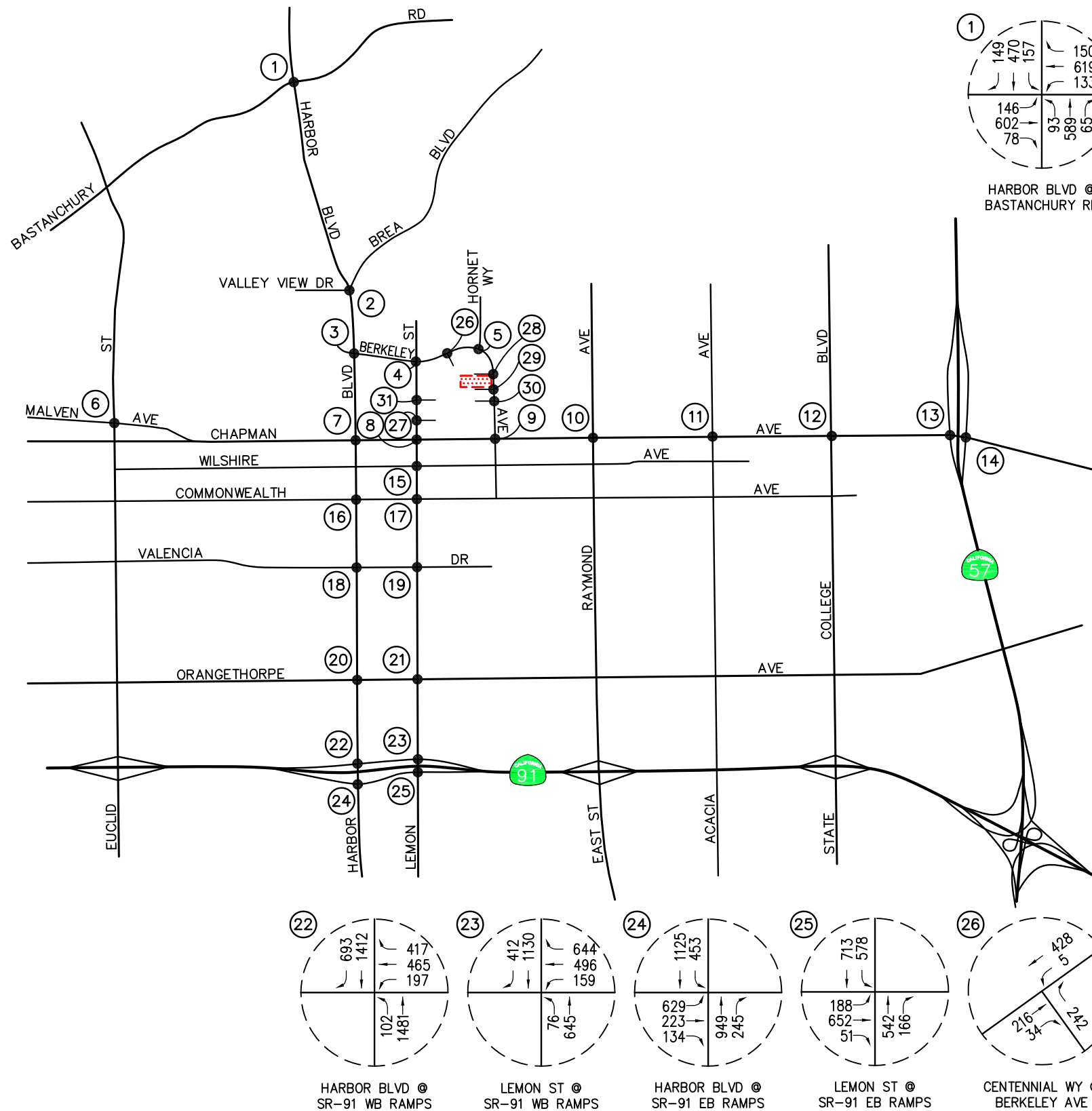














## 6.0 FUTURE TRAFFIC CONDITIONS

### 6.1 Year 2020 Traffic Volumes

The Cumulative Base or “background” traffic projections account for existing traffic volumes, and include two growth elements over existing traffic volumes: (1) increase in the existing traffic volumes due to overall regional growth, inclusive of the development of projects outside the study area; and (2) traffic generated by specific developments expected to be constructed by the Year 2020 in the vicinity of the project study area. In order to develop forecasts for the Year 2020, existing (Year 2017) traffic volumes were increased by a total ambient growth factor of 1.5% (0.5% per year). The ambient growth factors were provided by City of Fullerton staff and are based on the City’s review of local/regional growth projections in the area of the proposed Project. The City of Fullerton provided volumes from their in-house traffic model for all cumulative projects related to Year 2020 traffic conditions. It should be noted that a portion of the Fullerton College Master Plan student growth (i.e. 638 students out of 3,189 students) was also included as a cumulative project in the Year 2020.

The weekday PM peak hour traffic volumes associated with the cumulative projects in the Year 2020 are presented in **Figure 6-1**. The Saturday Event Arrival and Saturday Event Departure peak hour traffic volumes associated with the cumulative projects in the Year 2020 are presented in **Figure 6-2**. It should be noted that the Saturday cumulative project traffic volumes were adjusted to be 75% of the weekday PM peak hour cumulative project traffic volumes. The 25% reduction was based on a comparison between existing PM peak hour traffic volumes and existing Saturday Midday and Afternoon peak hour traffic volumes at key study intersections around the campus (i.e. key study intersections #4, #7, #8 and #9). The comparisons revealed a volume reduction between approximately 25% and 50%. Based on discussions with City of Fullerton staff, it was determined that a 25% reduction should be utilized to provide a conservative forecast for the Saturday cumulative project traffic volumes.

**Figure 6-3** presents the weekday PM peak hour cumulative traffic volumes (existing traffic + ambient growth + cumulative projects) at the key study intersections for the Year 2020. **Figures 6-4** and **6-5** present the Saturday Event Arrival and Saturday Event Departure peak hour cumulative traffic volumes (existing traffic + ambient growth + cumulative projects) at the key study intersections for the Year 2020, respectively.

**Figure 6-6** illustrates the Year 2020 forecast weekday PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (i.e. academic instruction), respectively. **Figures 6-7** and **6-8** illustrate the Year 2020 forecast Saturday Event Arrival and Saturday Event Departure peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (i.e. field event), respectively.

**Appendix D** contains the Year 2020 weekday PM peak hour cumulative project traffic volumes for the thirty-one (31) key study intersections as provided by the City of Fullerton.

## 6.2 Year 2030 Buildout Traffic Volumes

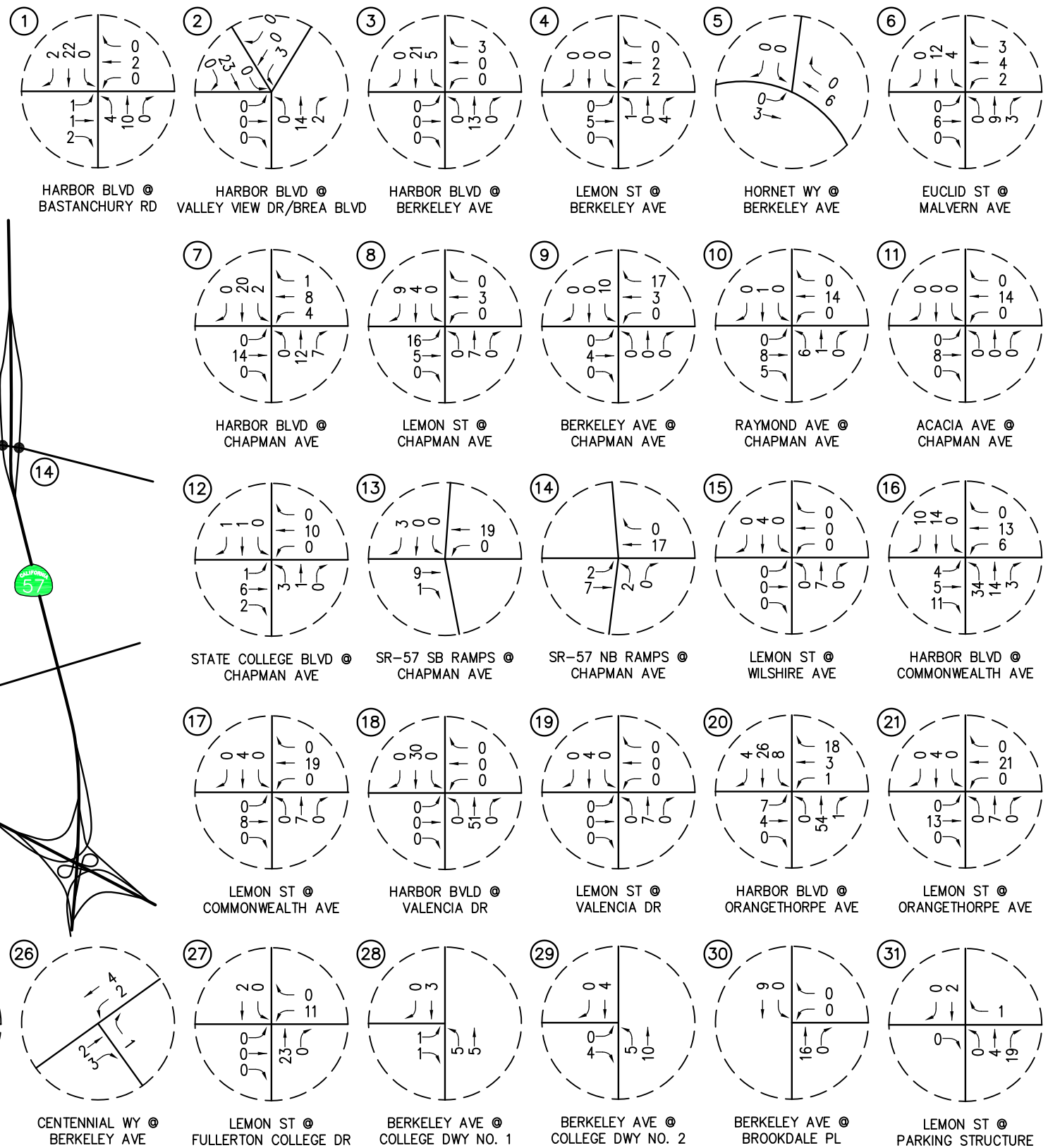
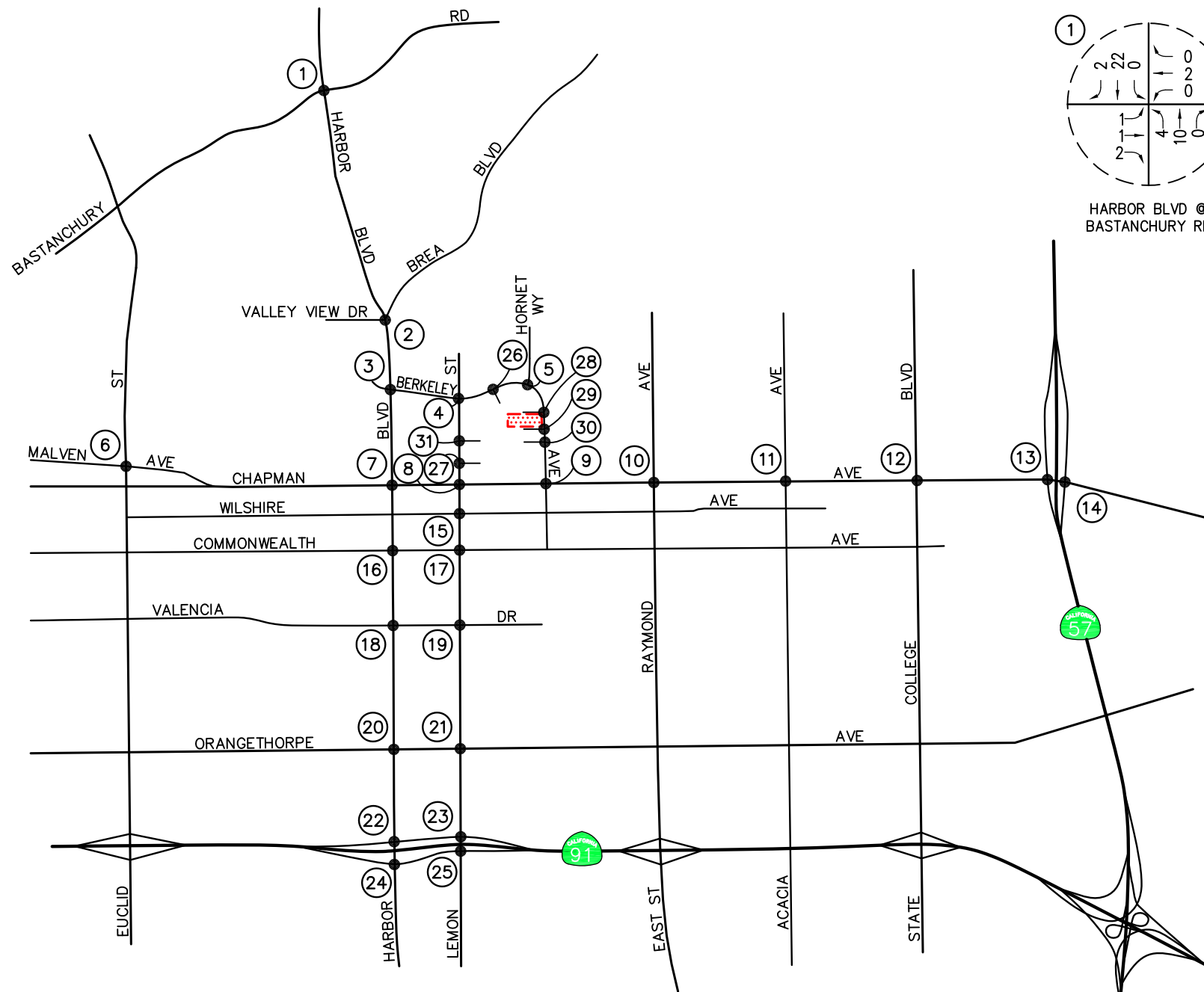
Similar to the approach in forecasting Year 2020 traffic volumes, Year 2030 peak hour background traffic volumes were forecast based on application of growth rates provided by the City of Fullerton to existing traffic volumes, and by further adding traffic volumes from all future cumulative projects (i.e. buildout of the City). A 10% total growth was applied to existing traffic volumes at key study intersections for all major through movements, and for any major turn movements, as identified by City of Fullerton staff. A 5% total growth was applied to existing traffic volumes for all of the remaining key intersection movements, which are considered to be minor movements. The ambient growth factors were provided by City of Fullerton staff and are based on the City's review of local/regional growth projections in the area of the proposed Project. The City of Fullerton provided volumes from their in-house traffic model for all cumulative projects related to Year 2030 traffic conditions. It should be noted that the Fullerton College Master Plan student growth (i.e. 3,189 students) was also included as a cumulative project in the Year 2030.

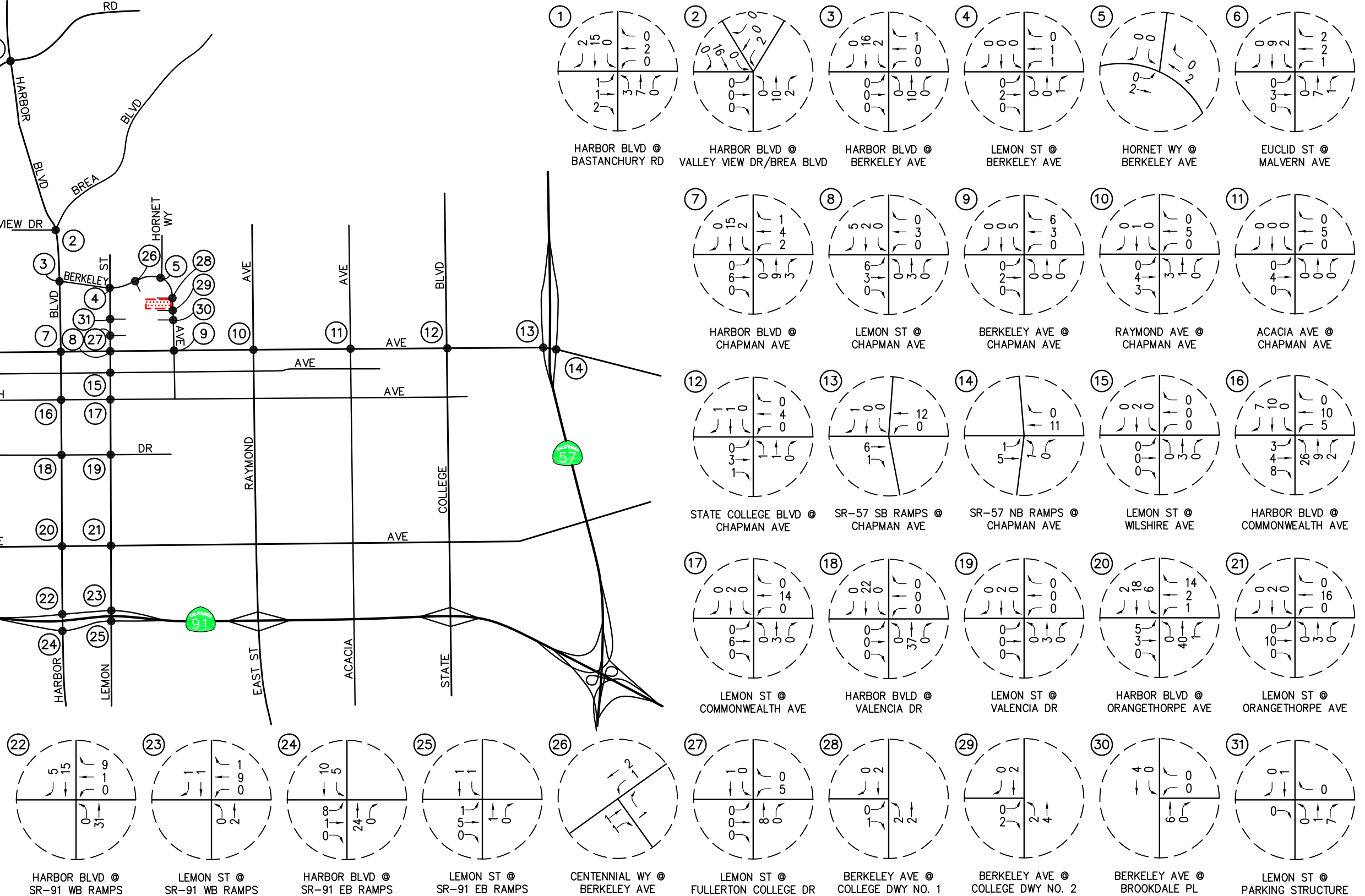
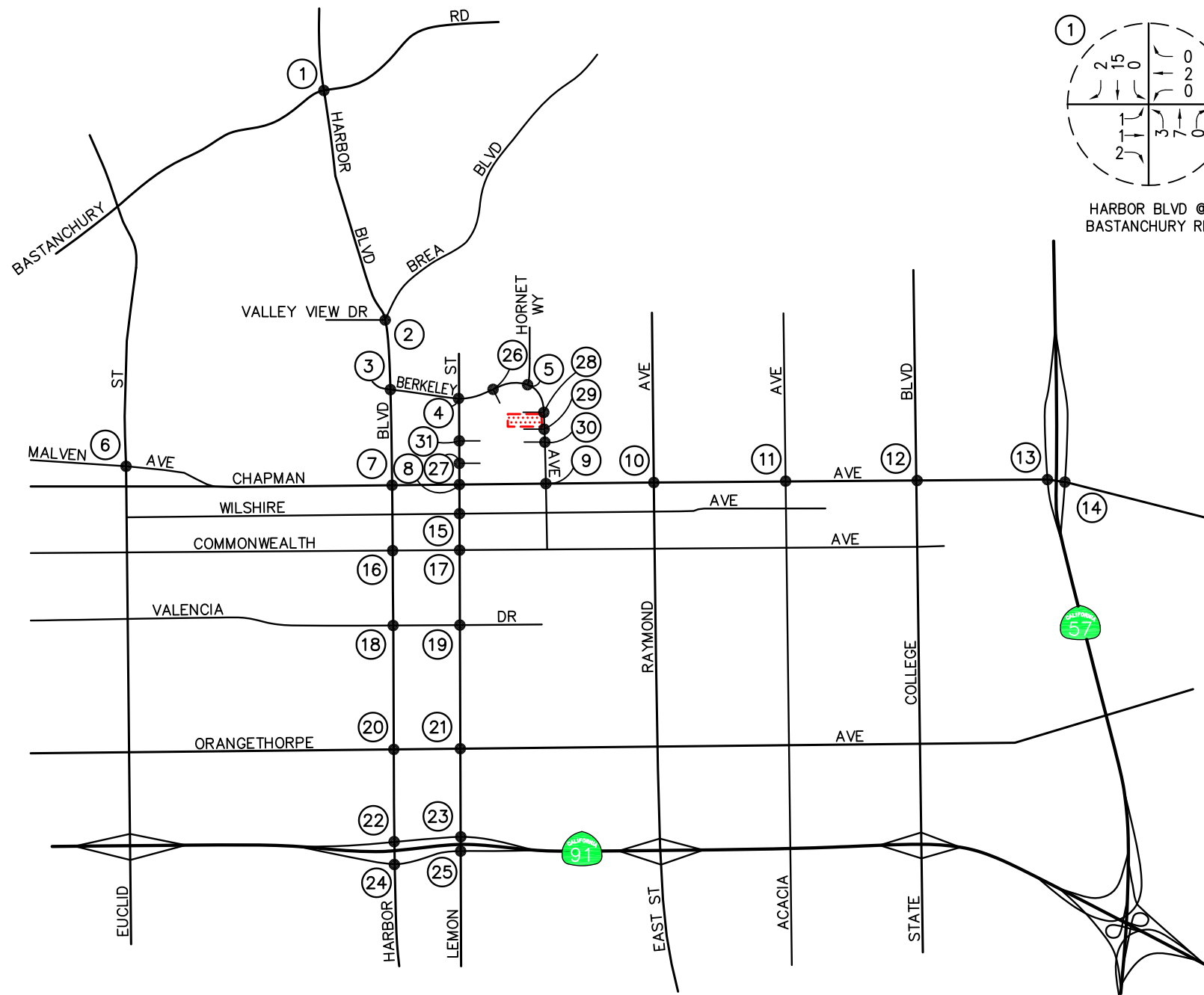
The weekday PM peak hour traffic volumes associated with the cumulative projects in the Year 2030 are presented in **Figure 6-9**. The Saturday Event Arrival and Saturday Event Departure peak hour traffic volumes associated with the cumulative projects in the Year 2030 are presented in **Figure 6-10**. It should be noted that the Saturday cumulative project traffic volumes were adjusted to be 75% of the weekday PM peak hour cumulative project traffic volumes. The 25% reduction was based on a comparison between existing PM peak hour traffic volumes and existing Saturday Midday and Afternoon peak hour traffic volumes at key study intersections around the campus (i.e. key study intersections #4, #7, #8 and #9). The comparisons revealed a volume reduction between approximately 25% and 50%. Based on discussions with City of Fullerton staff, it was determined that a 25% reduction should be utilized to provide a conservative forecast for the Saturday cumulative project traffic volumes.

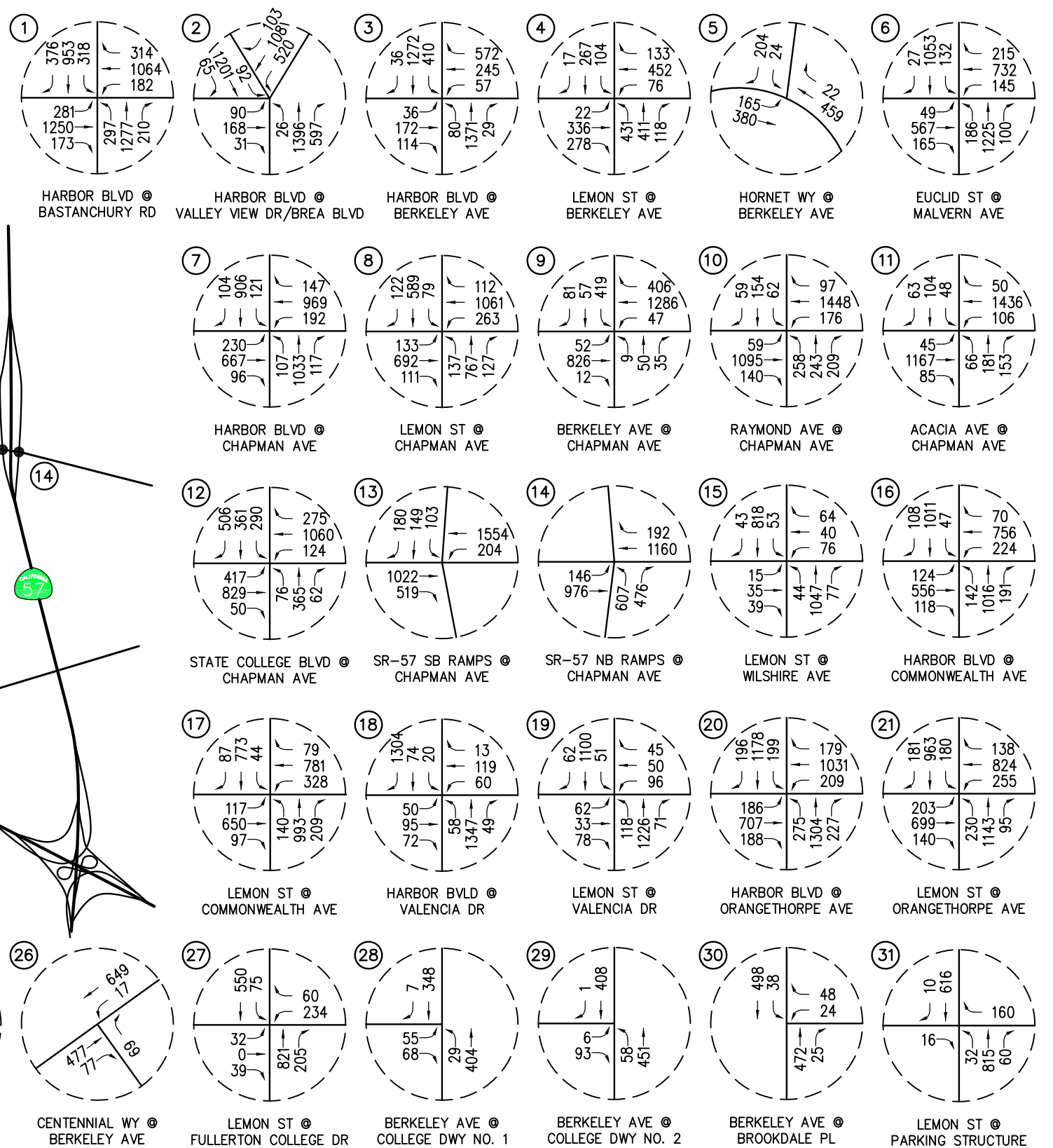
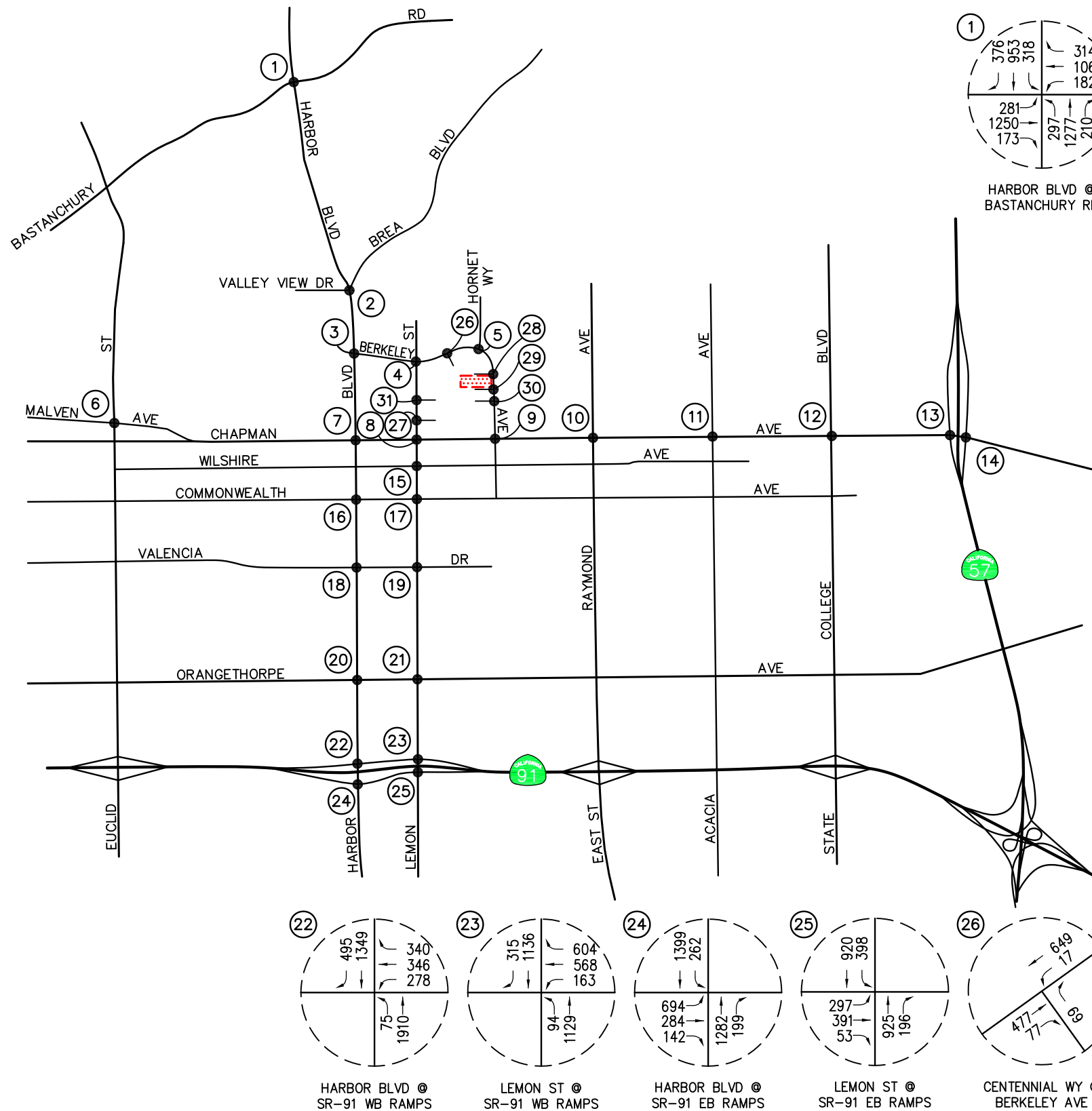
**Figure 6-11** presents the Year 2030 weekday PM peak hour buildout traffic volumes at the key study intersections. **Figures 6-12** and **6-13** present the Year 2030 Saturday Event Arrival and Saturday Event Departure peak hour buildout traffic volumes at the key study intersections, respectively. It should be noted that the buildout traffic volumes represent the accumulation of existing traffic, ambient growth traffic, and cumulative projects traffic.

**Figure 6-14** illustrates the Year 2030 forecast weekday PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (i.e. academic instruction), respectively. **Figures 6-15** and **6-16** illustrate the Year 2030 forecast Saturday Event Arrival and Saturday Event Departure peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (i.e. field event), respectively.

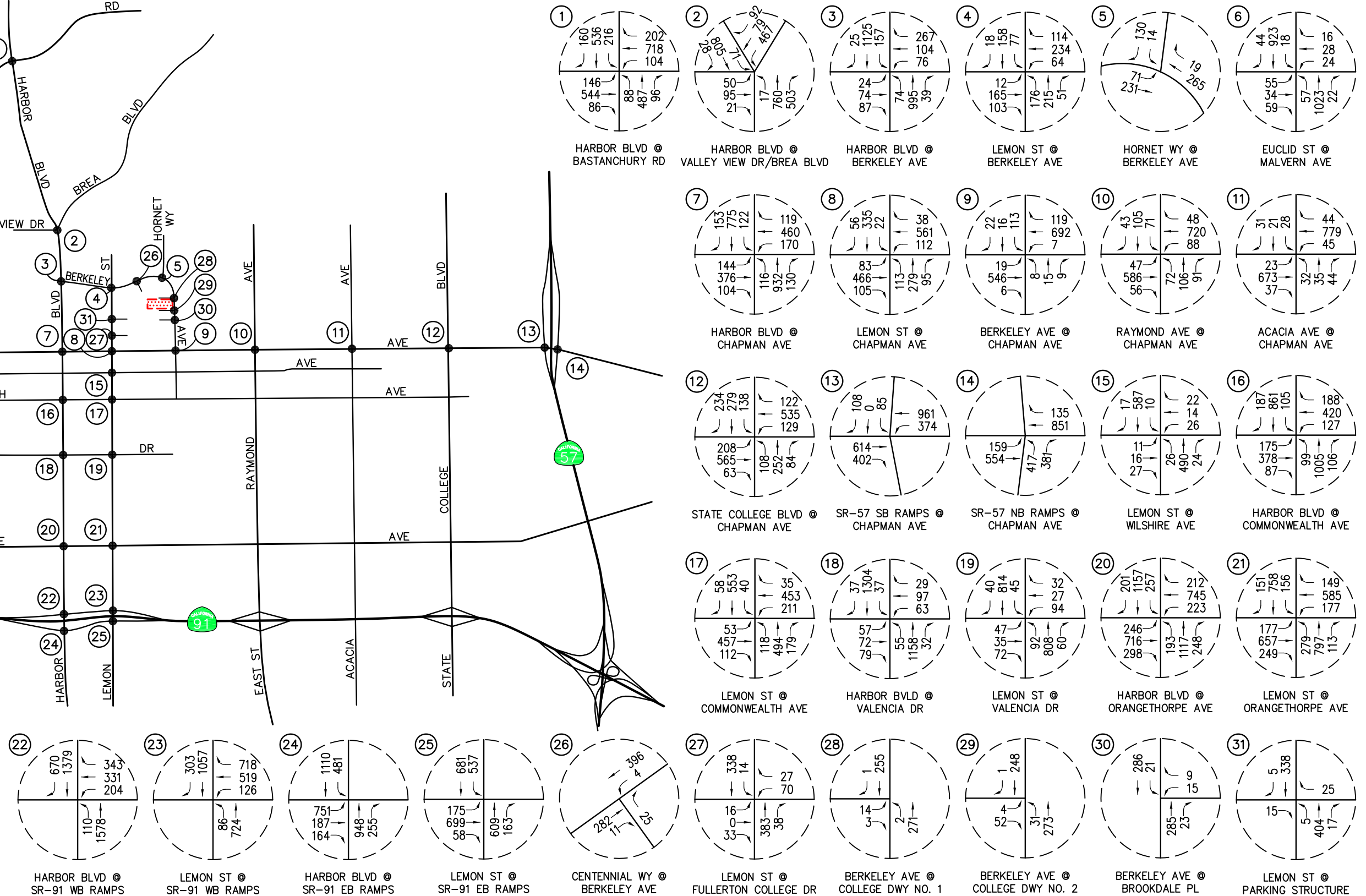
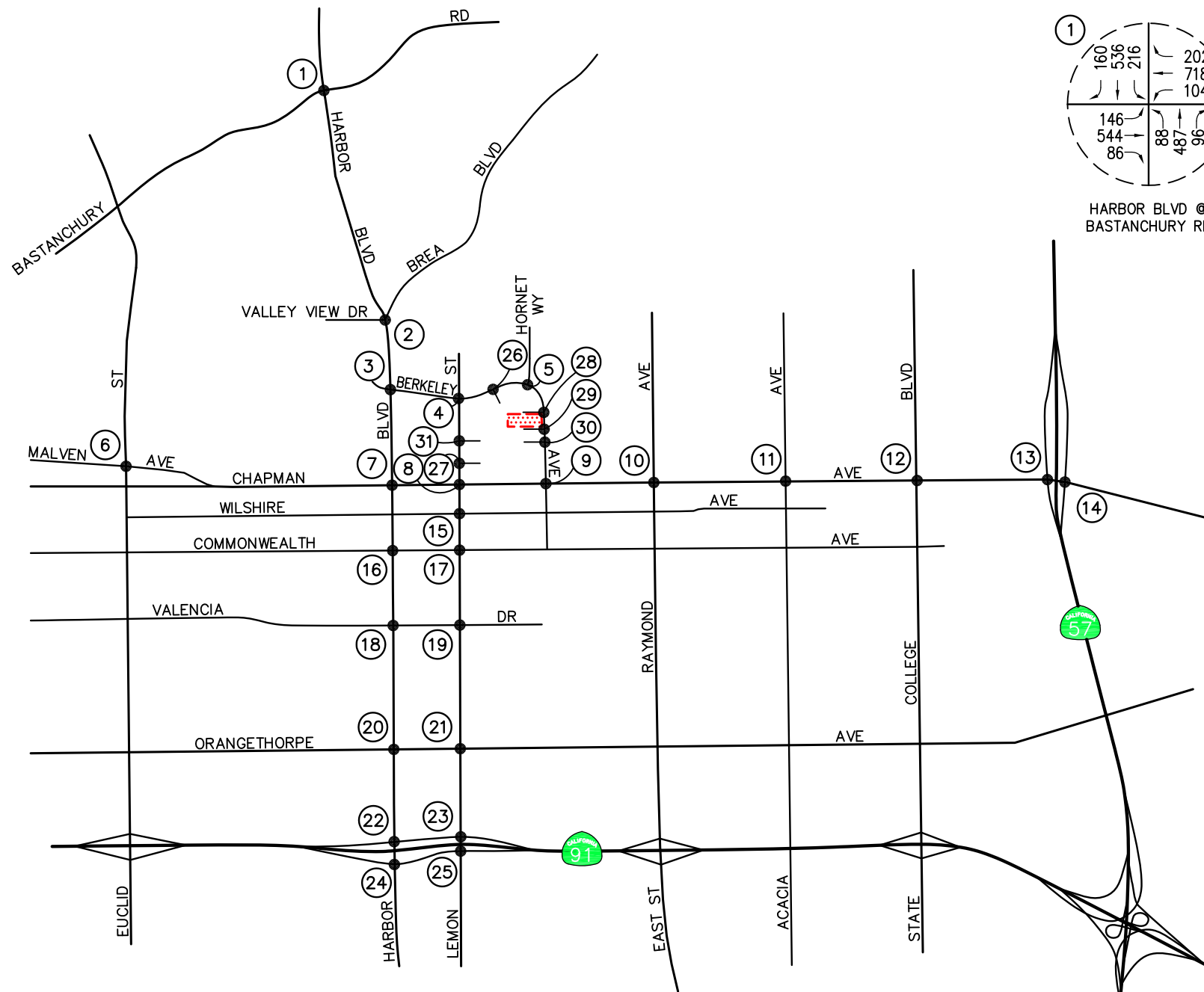
*Appendix D* also contains the Year 2030 weekday PM peak hour cumulative project traffic volumes for the thirty-one (31) key study intersections as provided by the City of Fullerton.

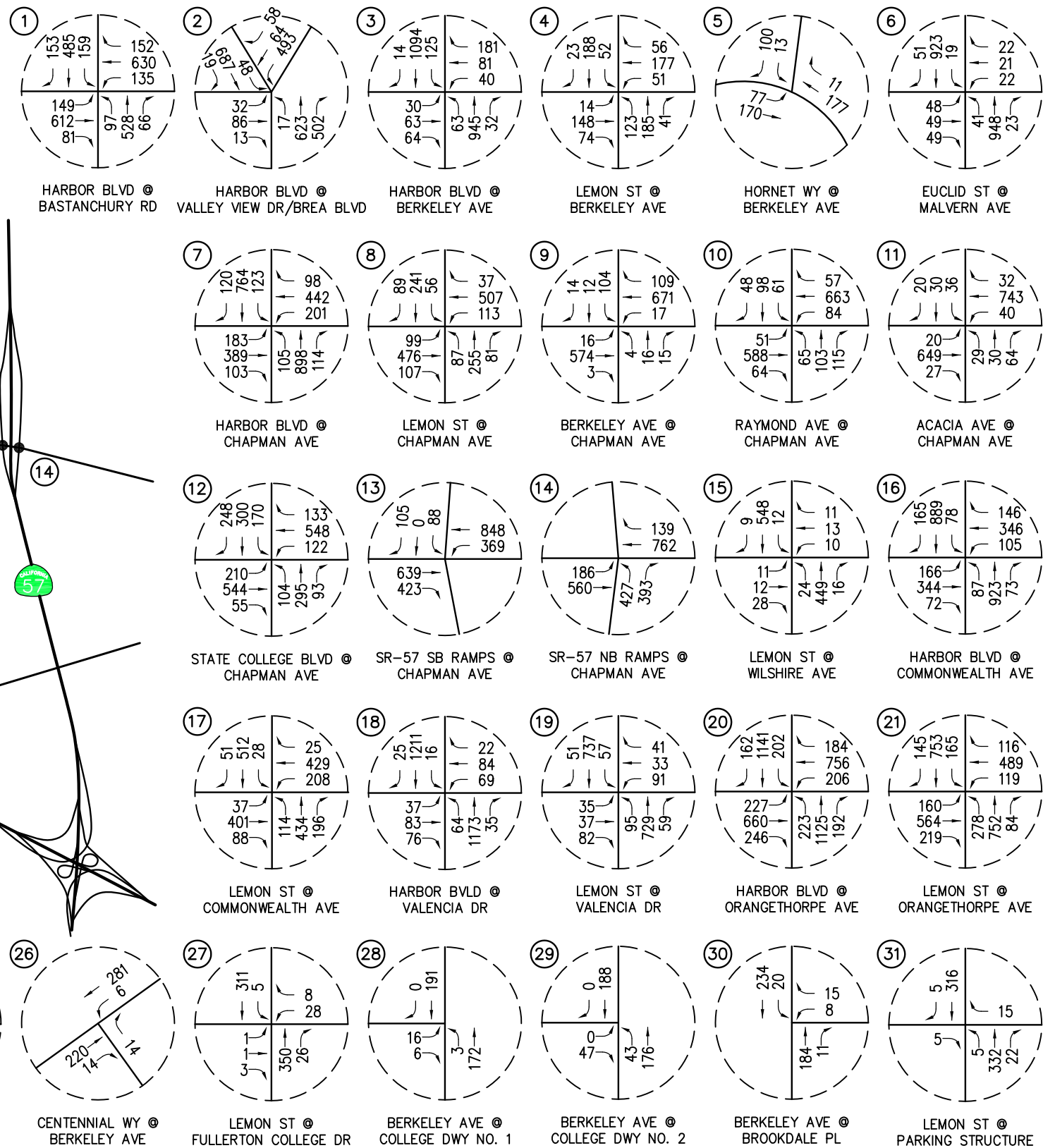
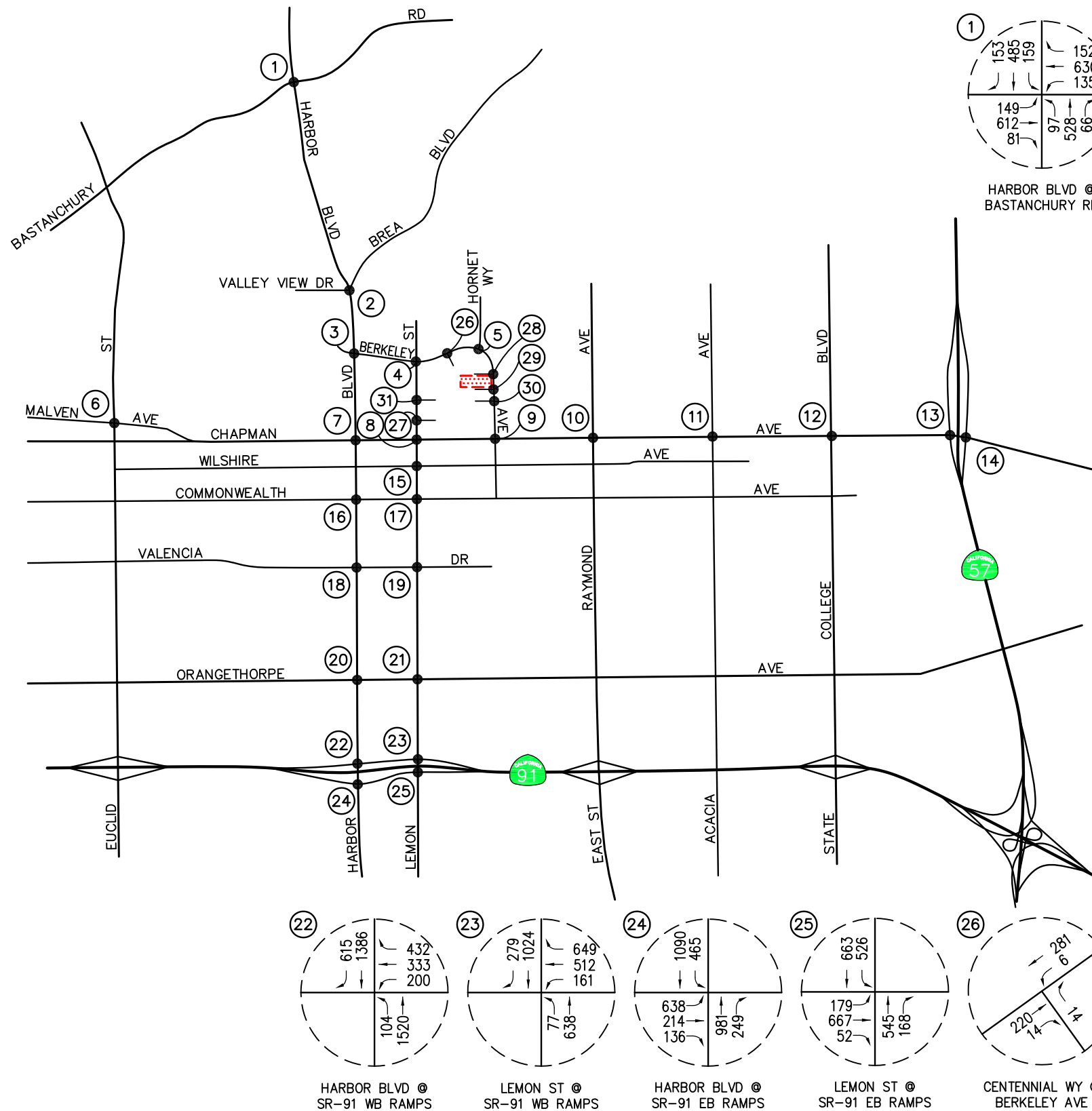


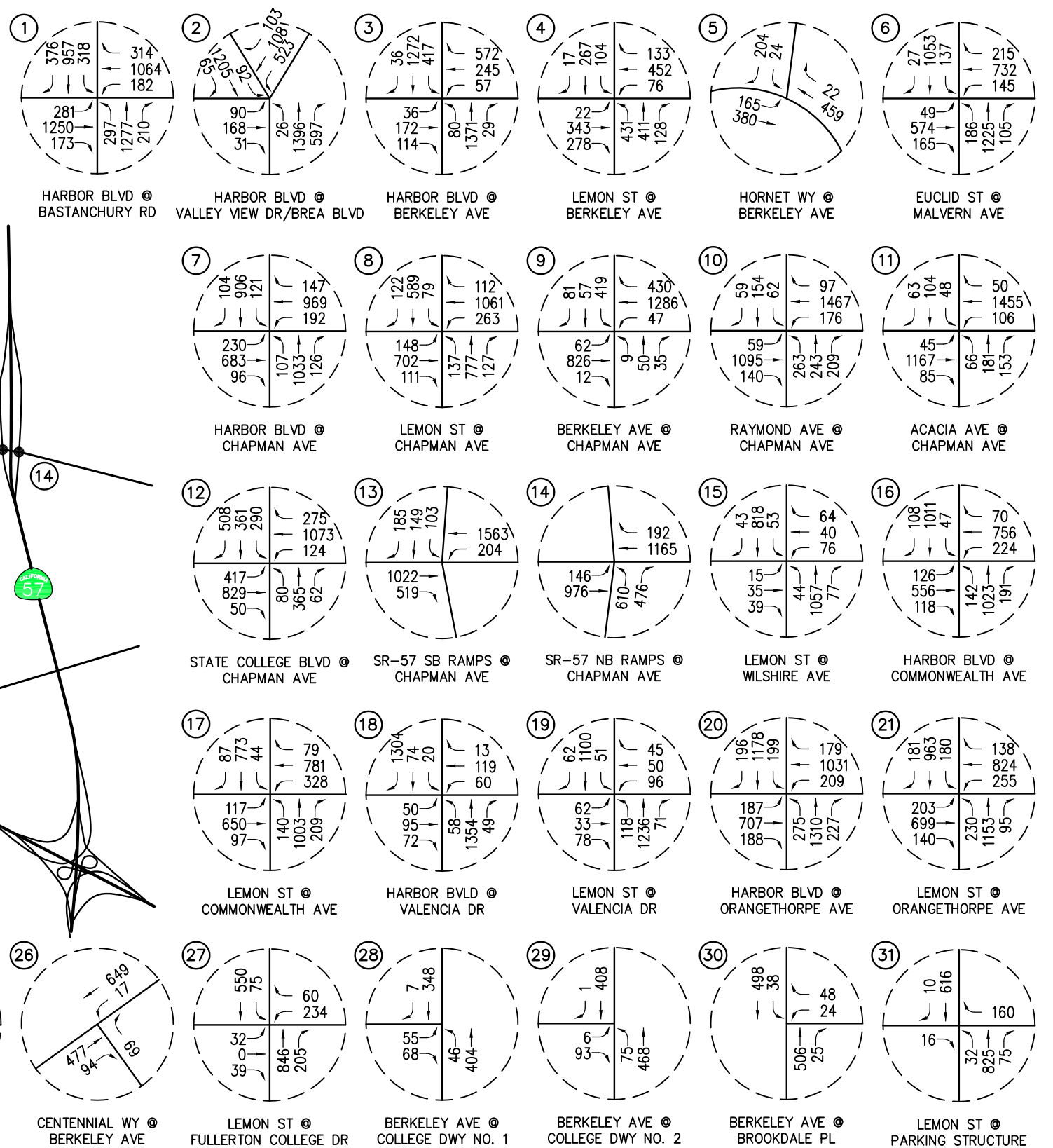
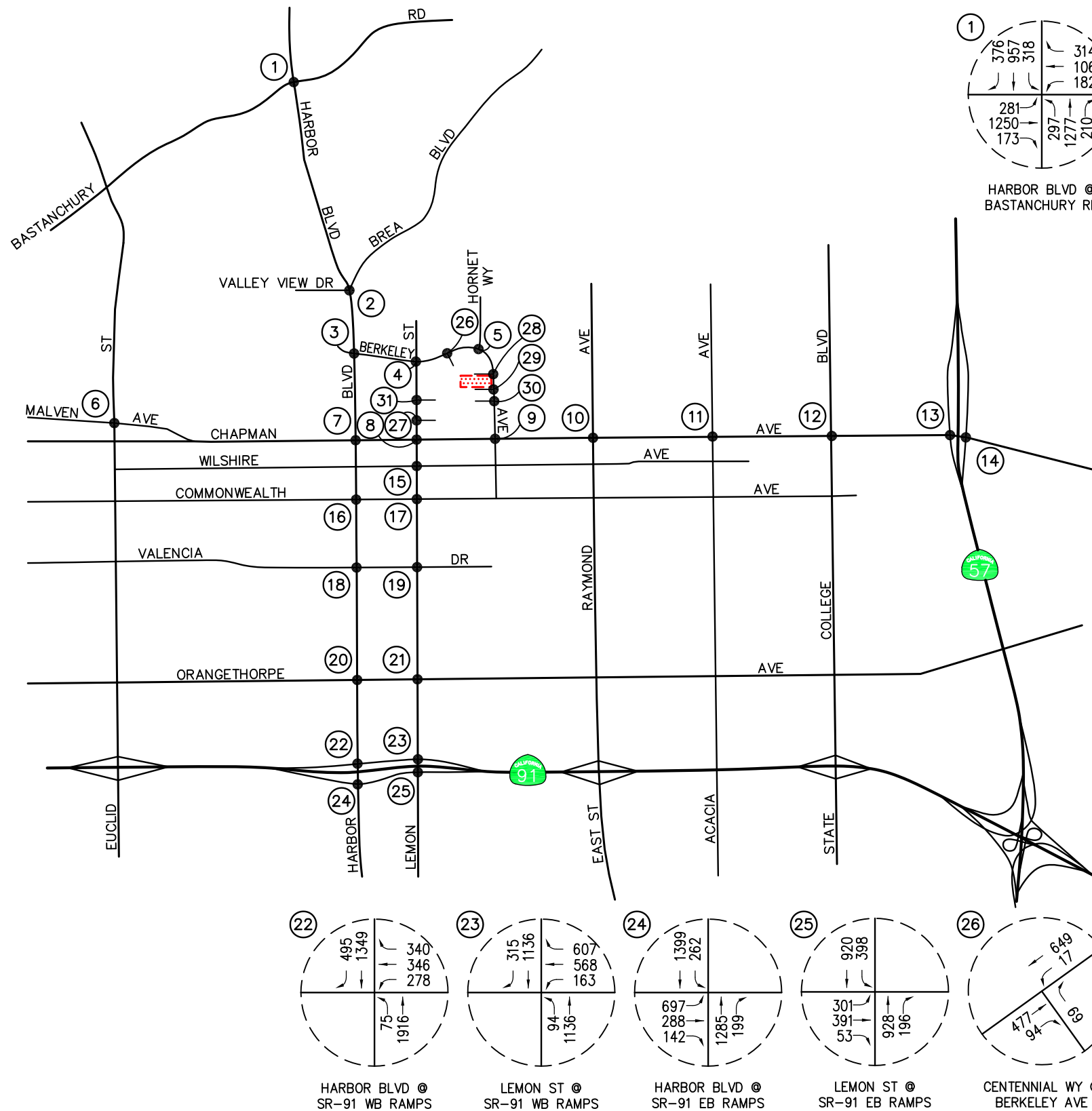












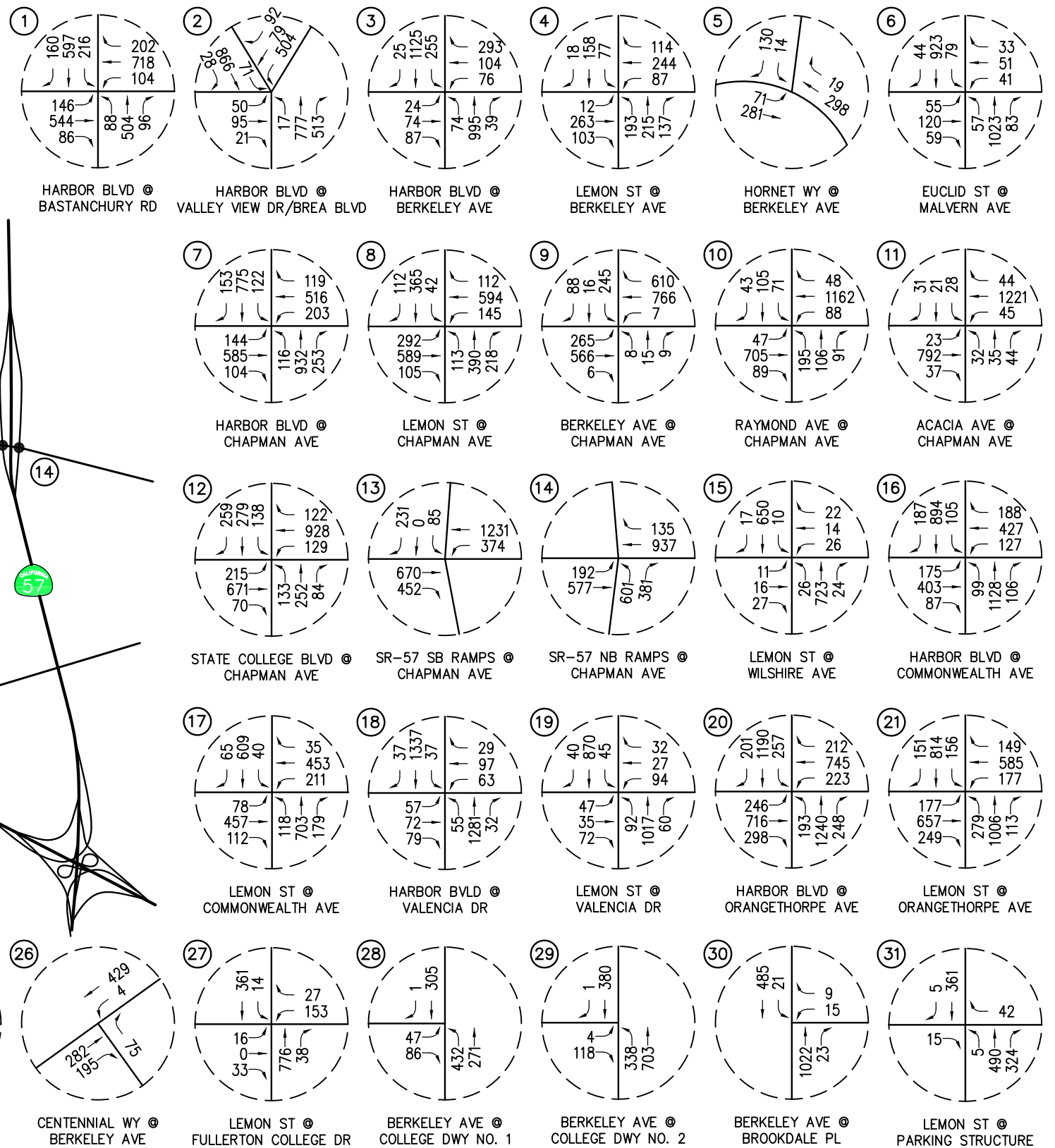
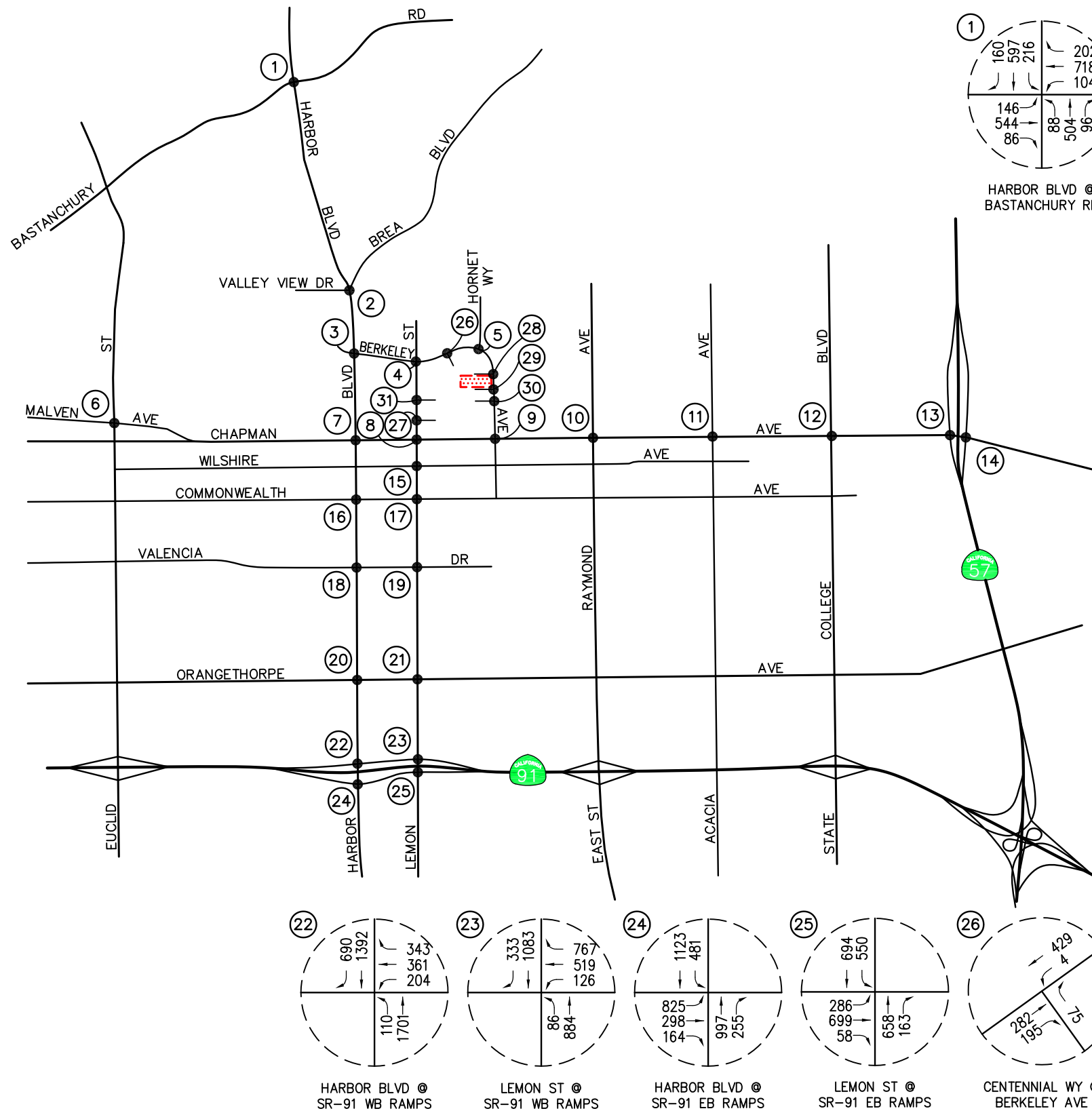
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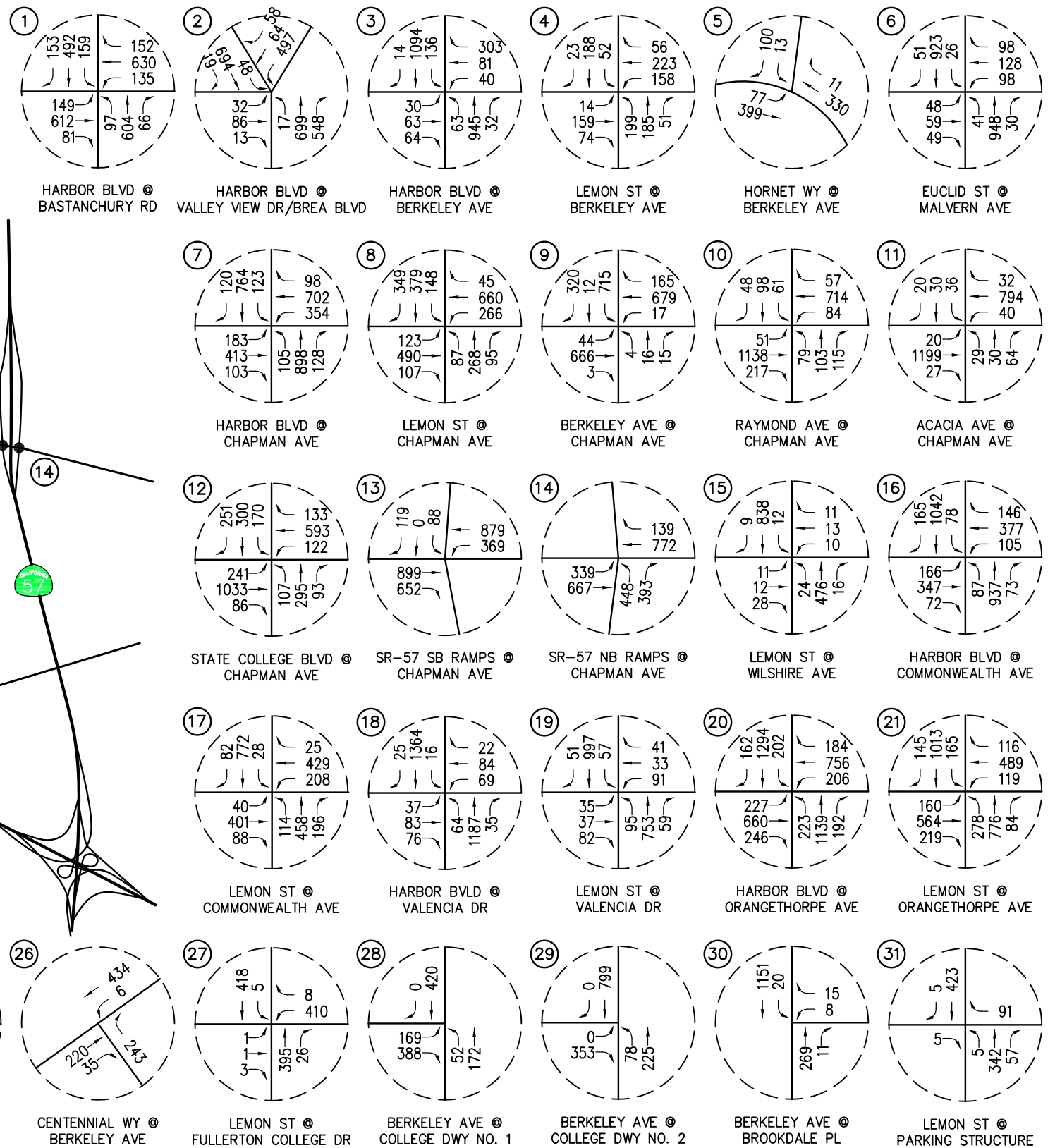
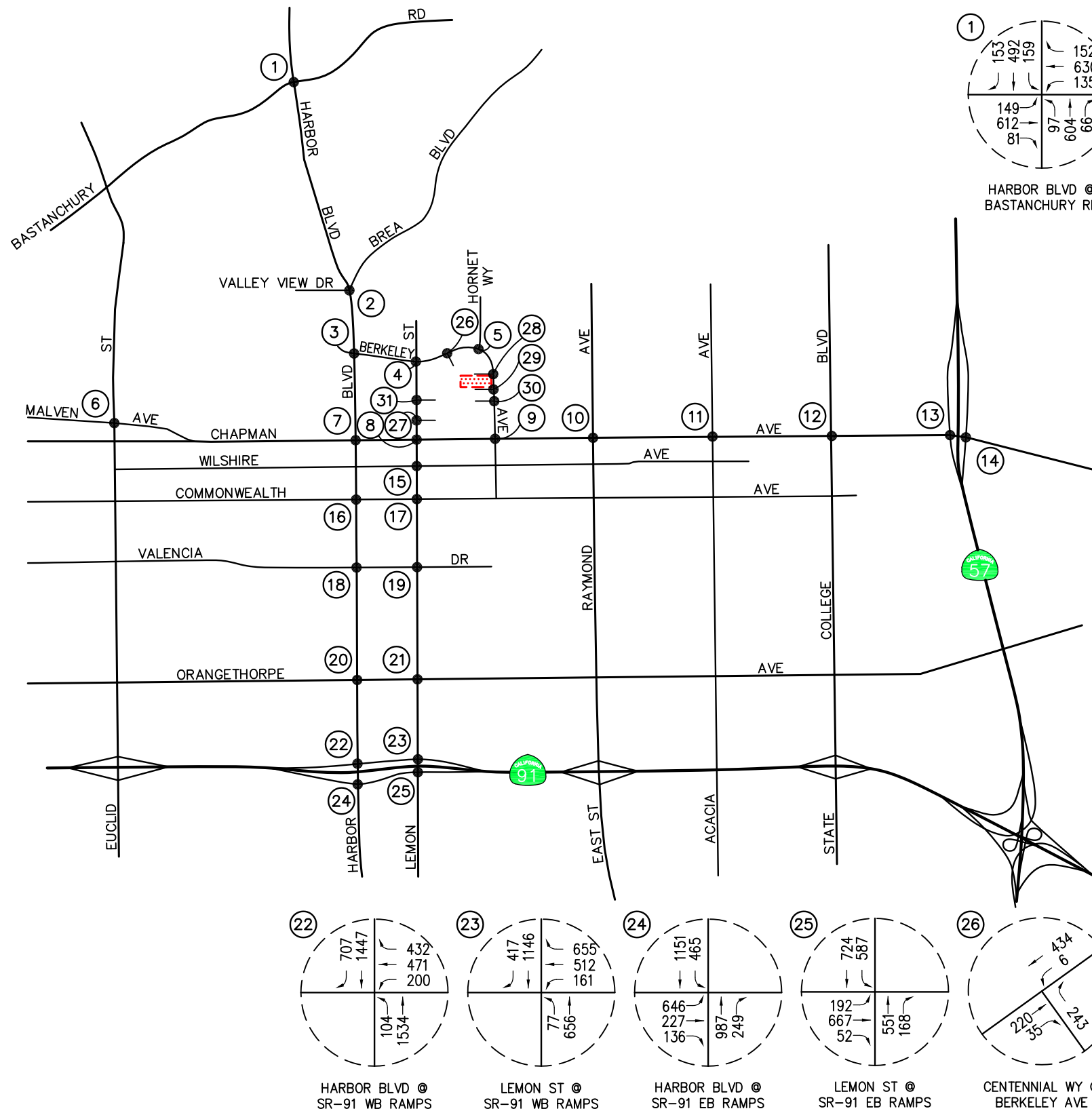
- # = STUDY INTERSECTION  
 = PROJECT SITE

FIGURE 6-6

YEAR 2020 WEEKDAY CUMULATIVE PLUS PROJECT  
PM PEAK HOUR TRAFFIC VOLUMES  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





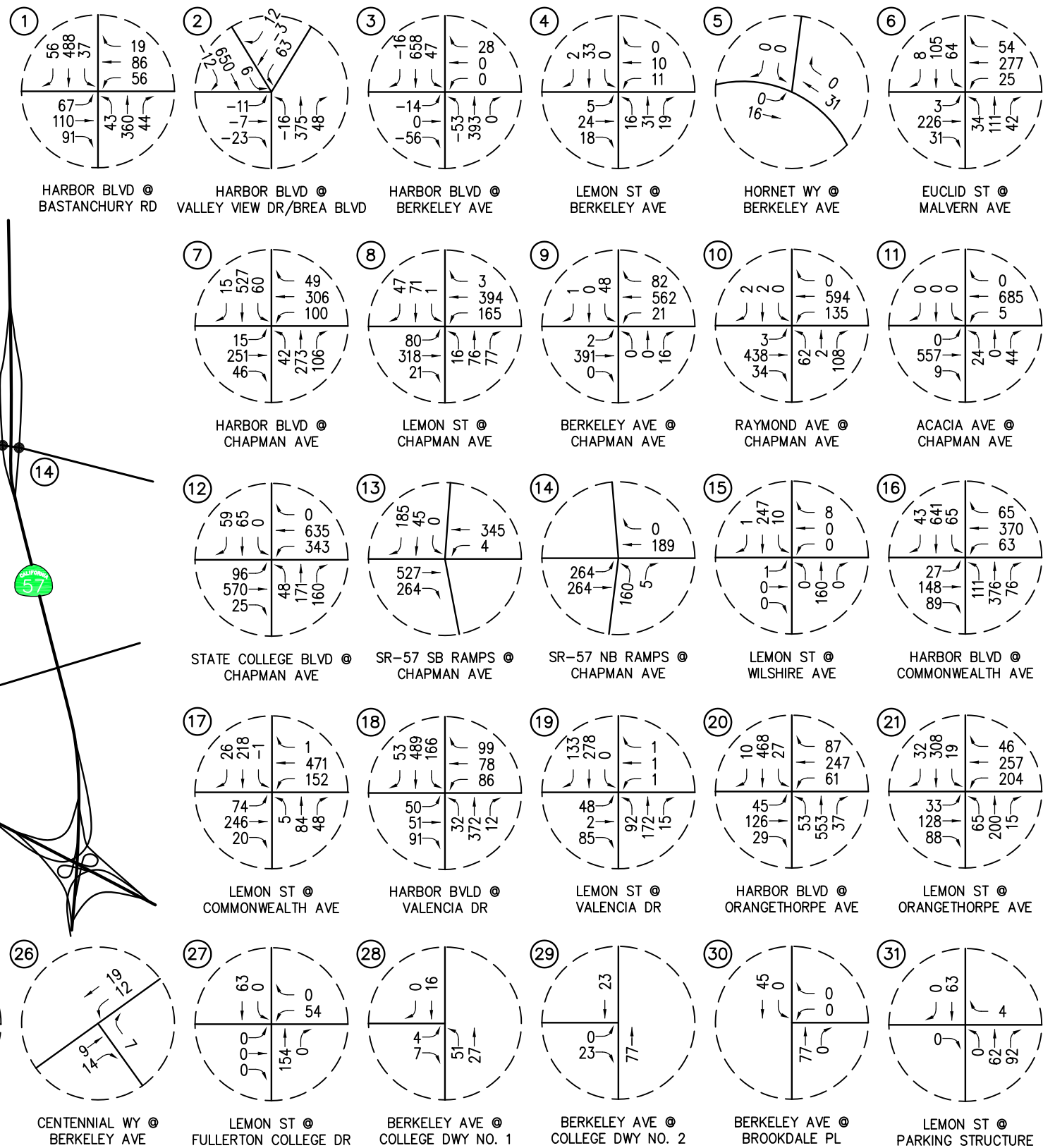
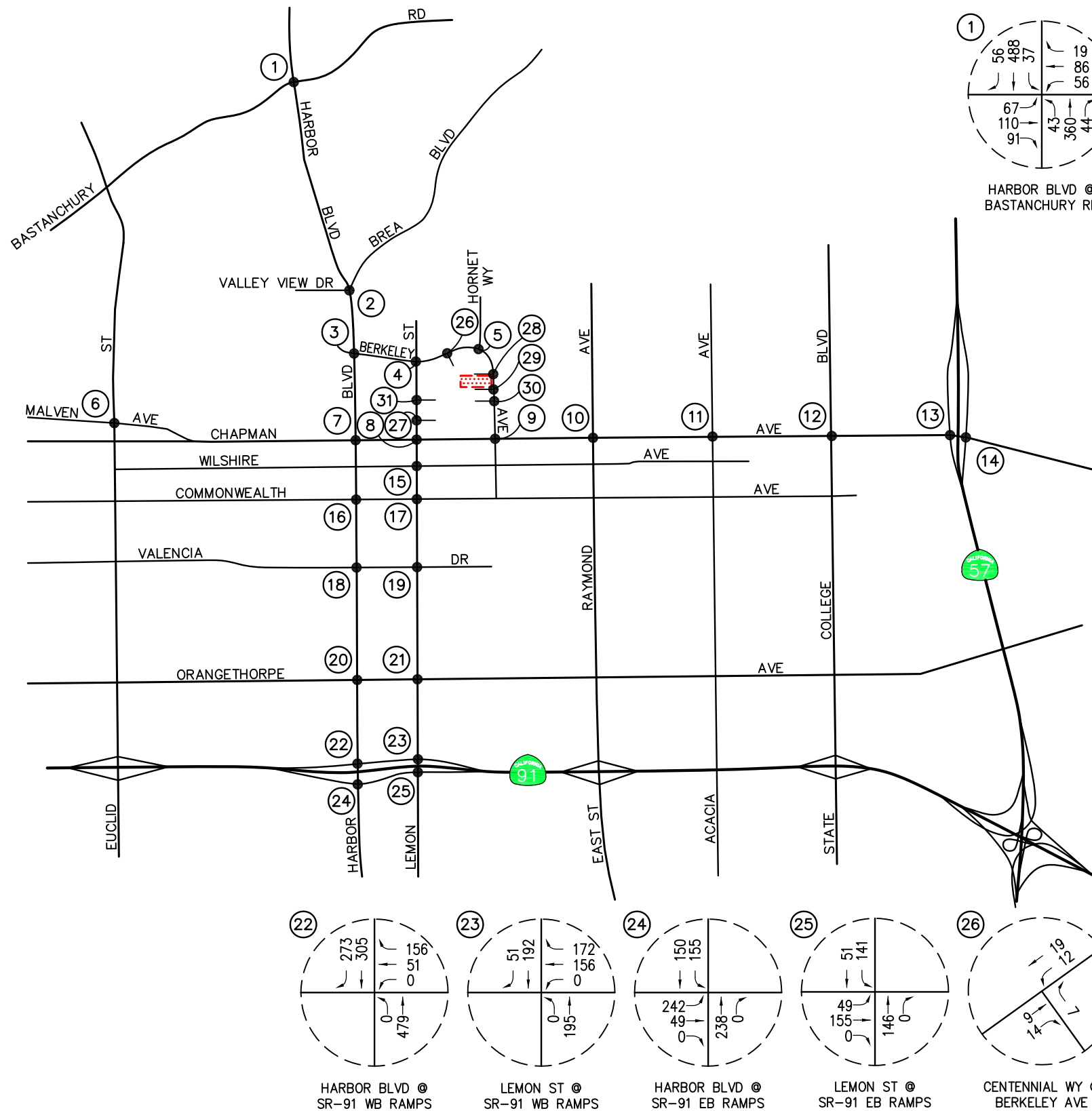


KEY

- # = STUDY INTERSECTION
- [Red Box] = PROJECT SITE

FIGURE 6-8

YEAR 2020 SATURDAY EVENT DEPARTURE PERIOD  
CUMULATIVE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



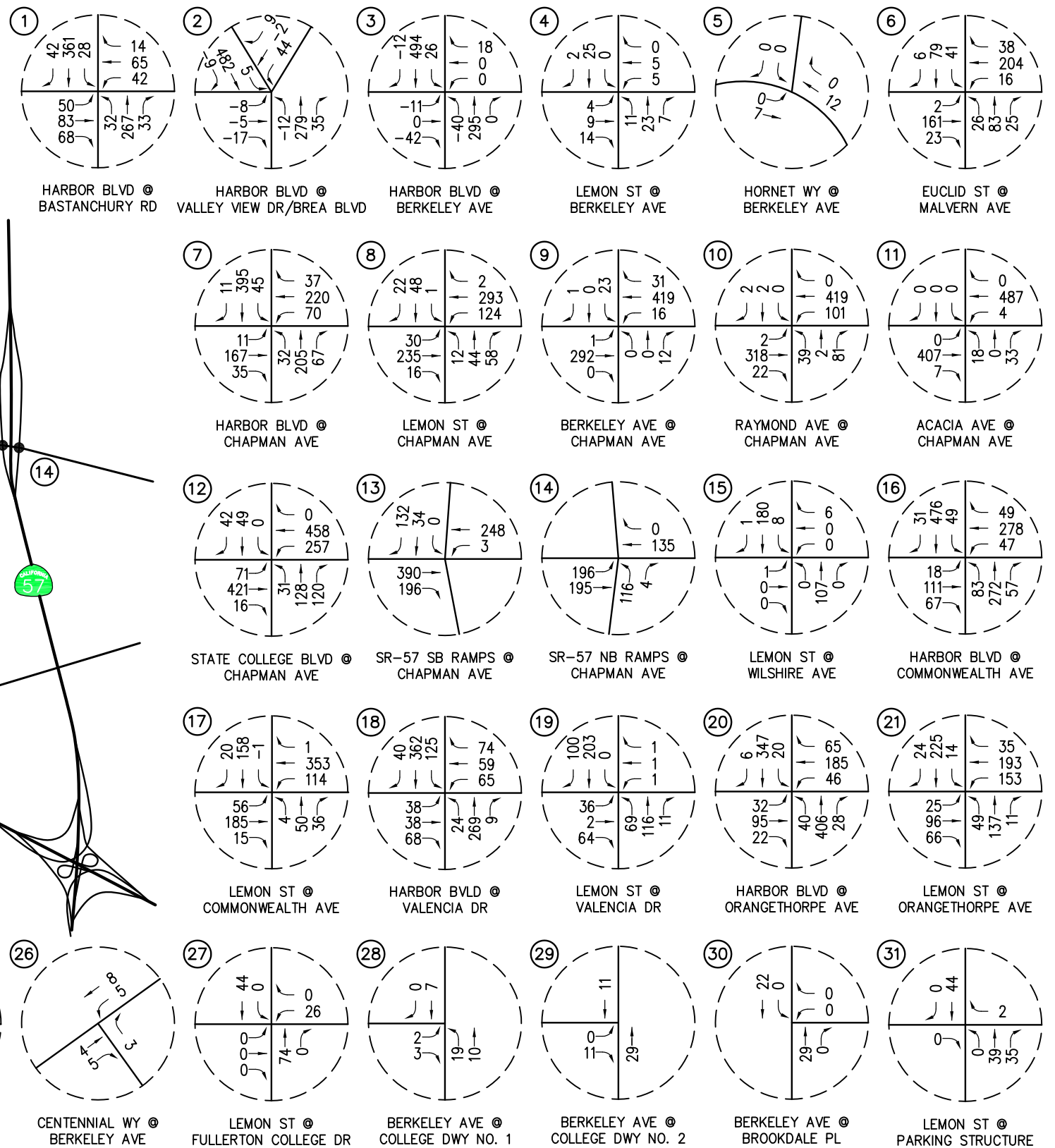
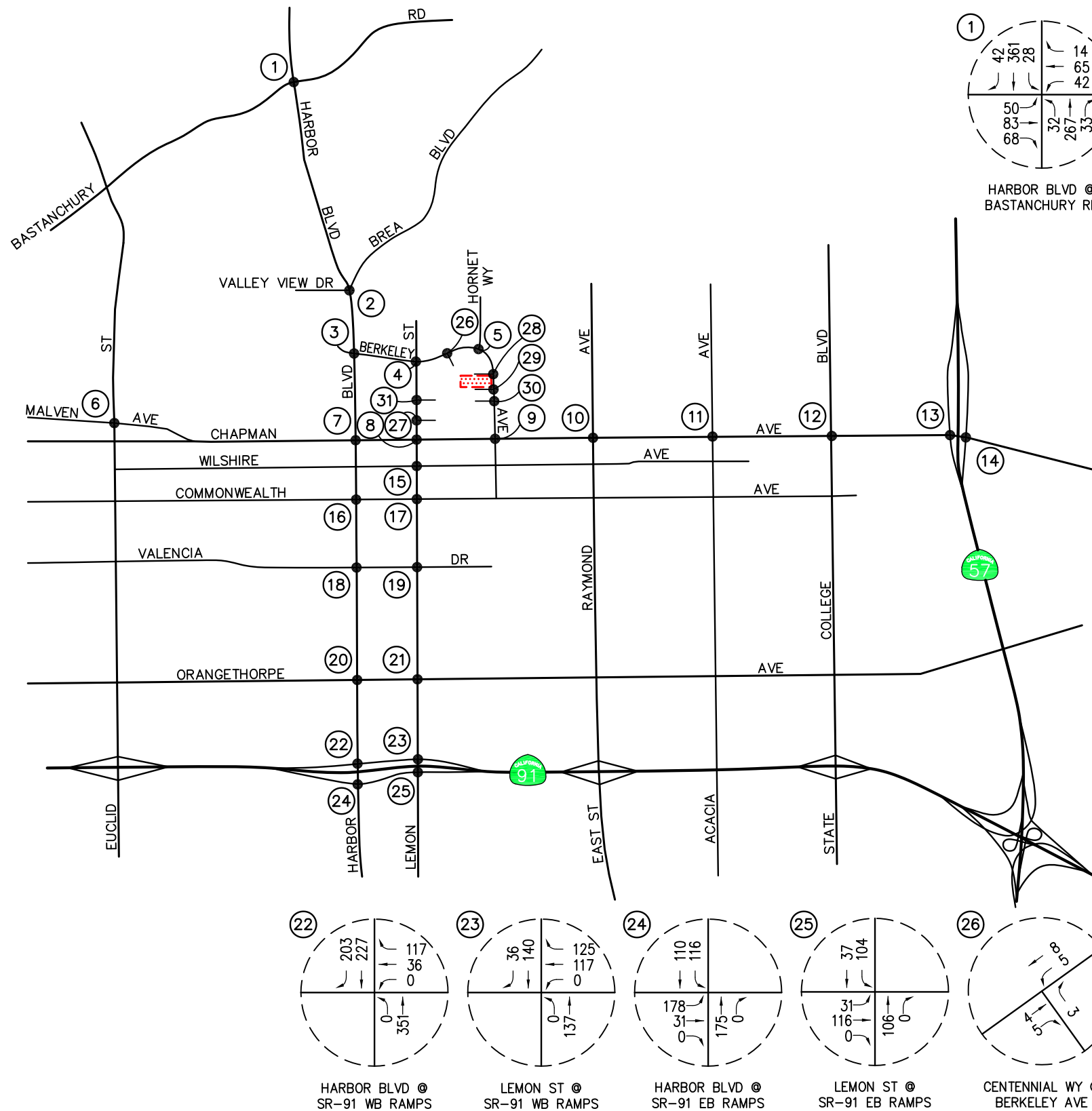
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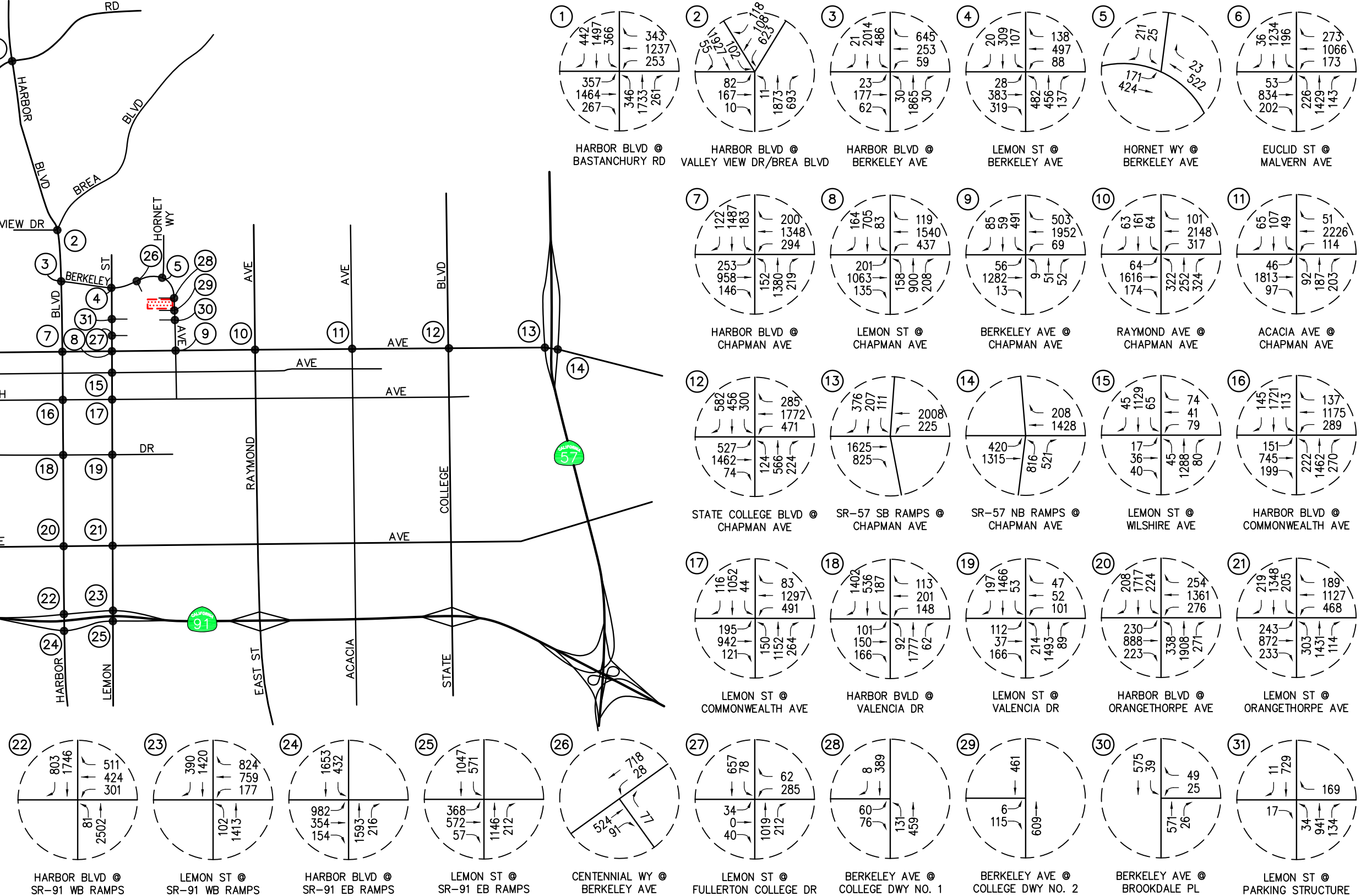
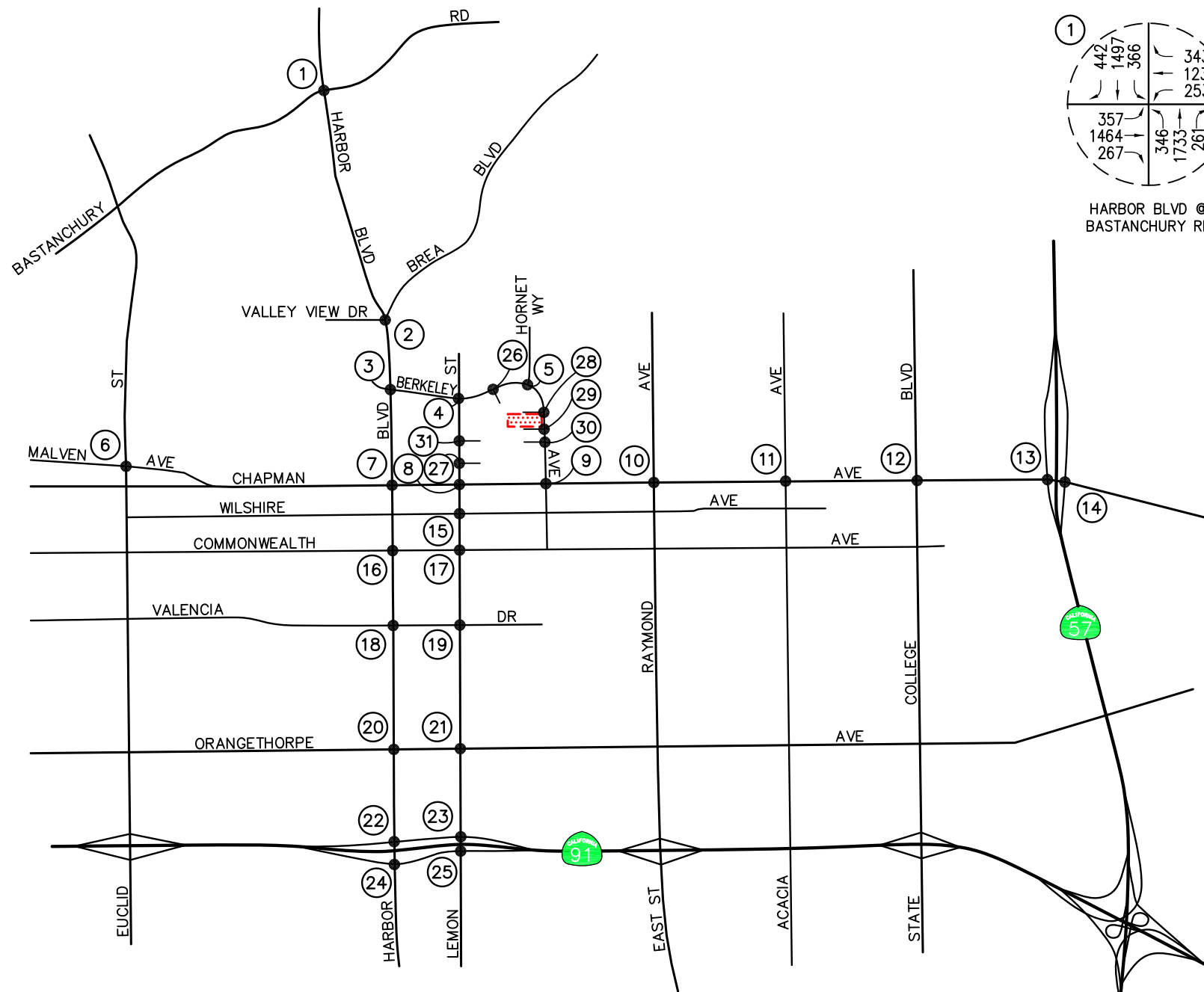
- # = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 6-9

YEAR 2030 WEEKDAY PM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





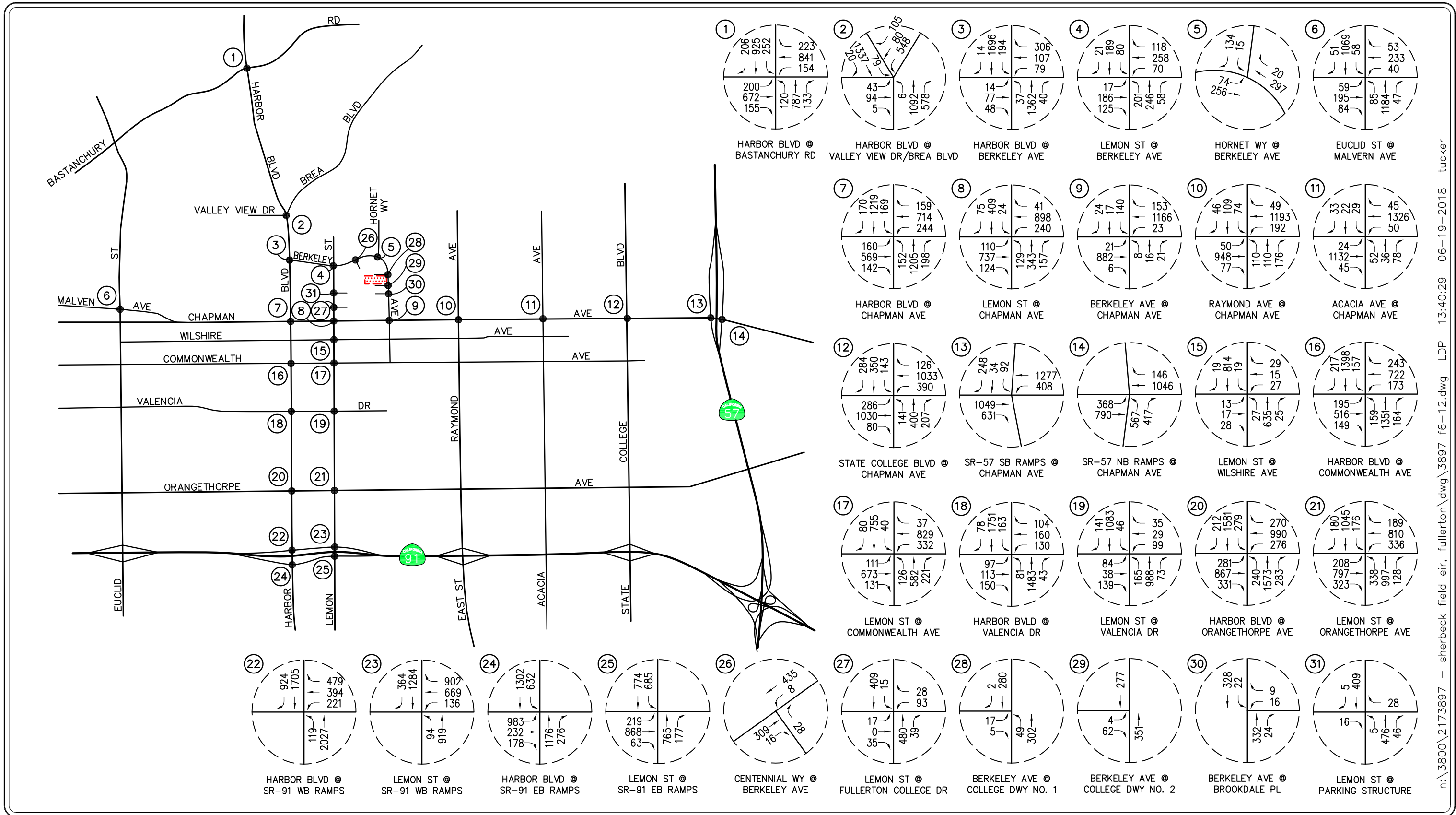


KEY

- # = STUDY INTERSECTION  
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FIGURE 6-11

YEAR 2030 WEEKDAY BUILDOUT PM PEAK HOUR TRAFFIC VOLUMES  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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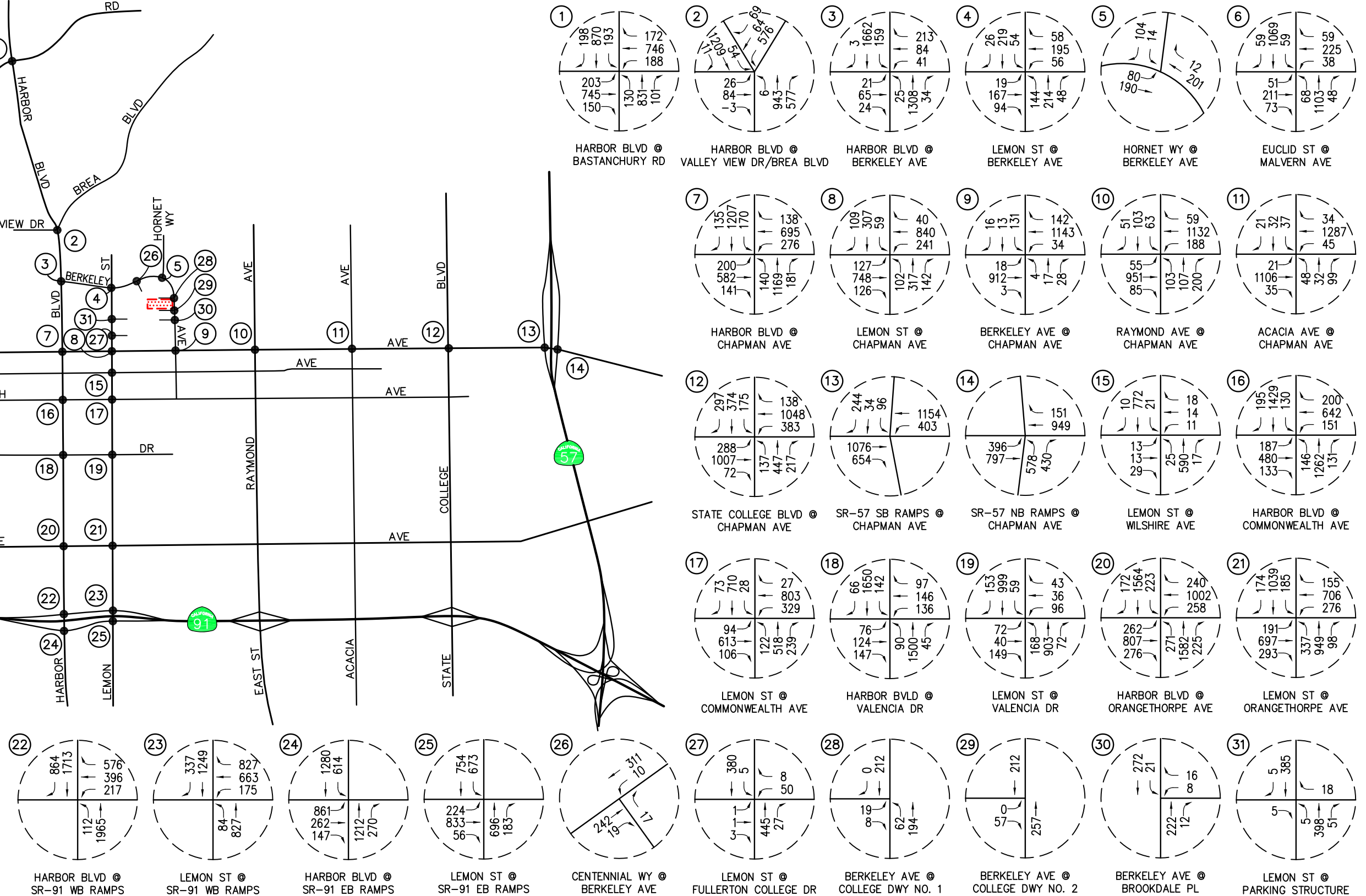
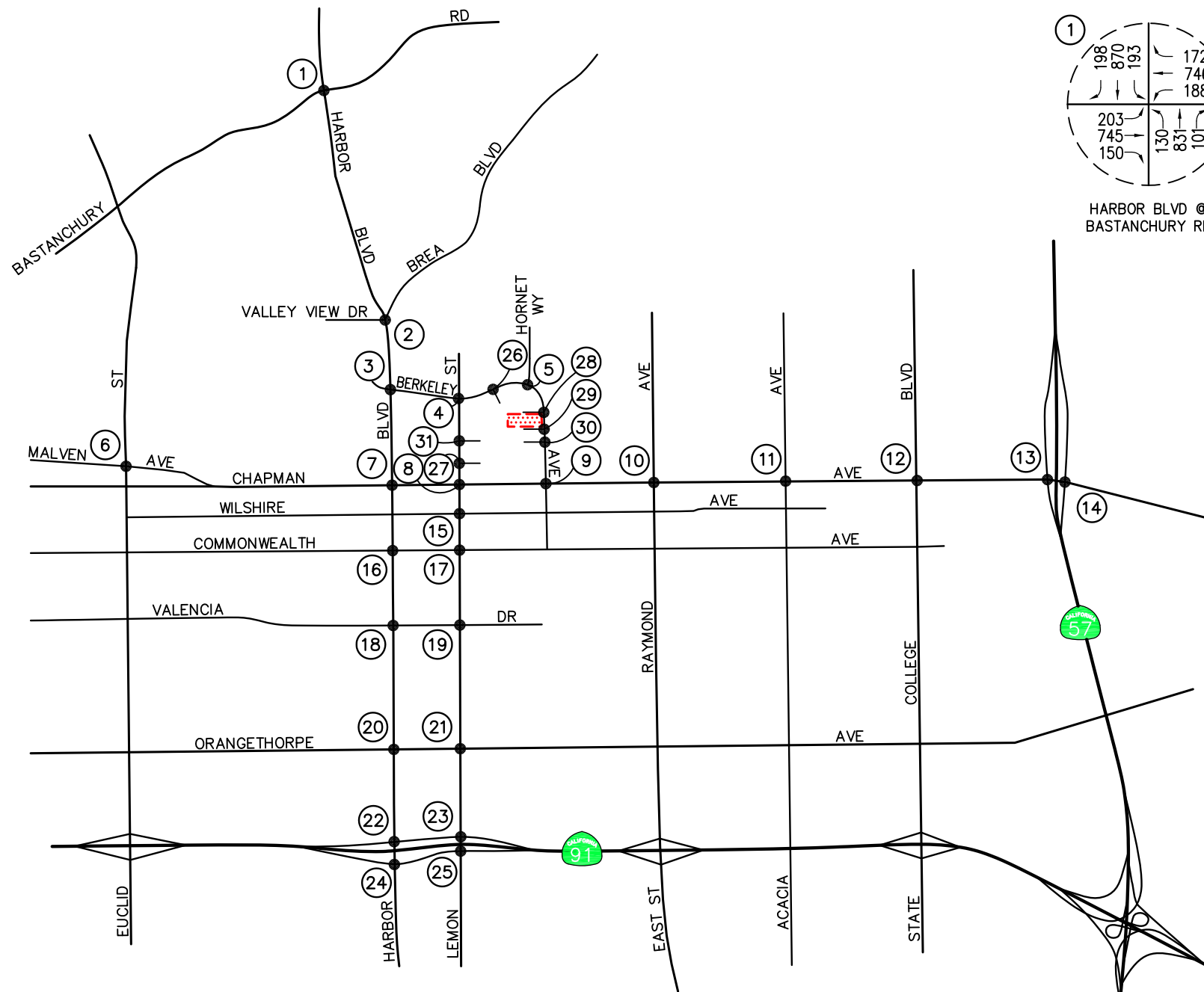


**KEY**  
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 = PROJECT SITE

**FIGURE 6-12**

**YEAR 2030 SATURDAY EVENT ARRIVAL PERIOD BUILDOUT TRAFFIC VOLUMES**  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



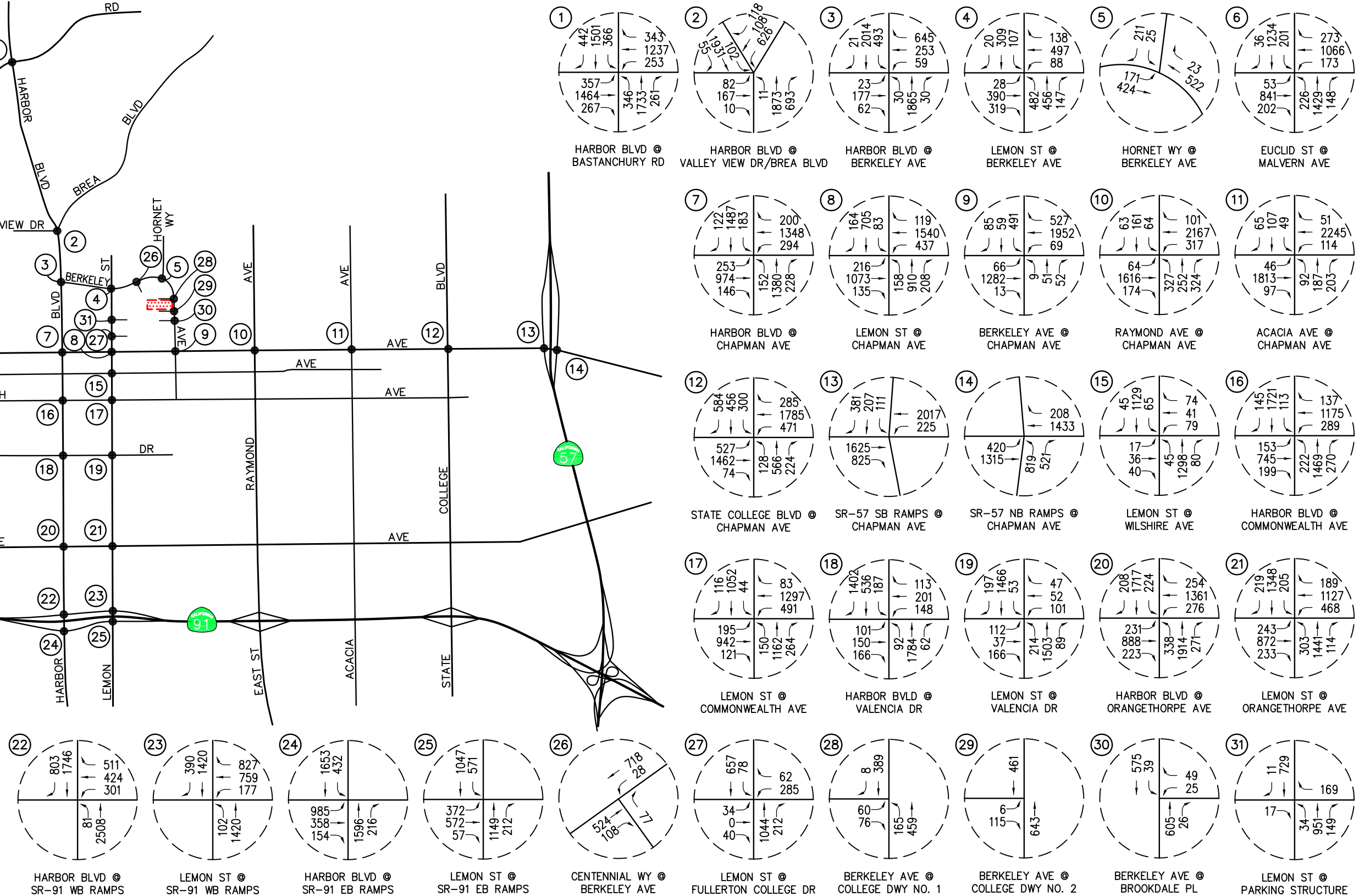
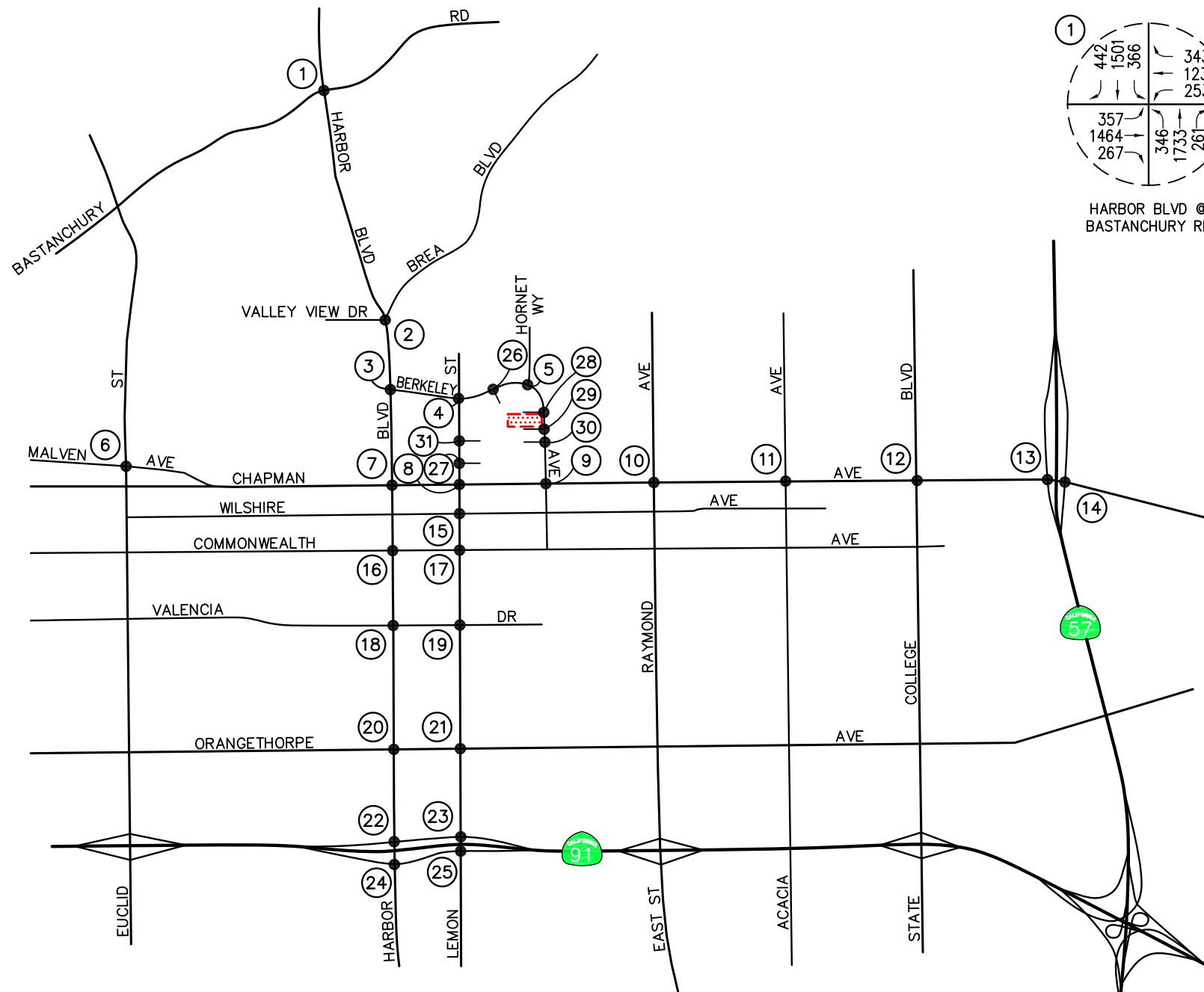


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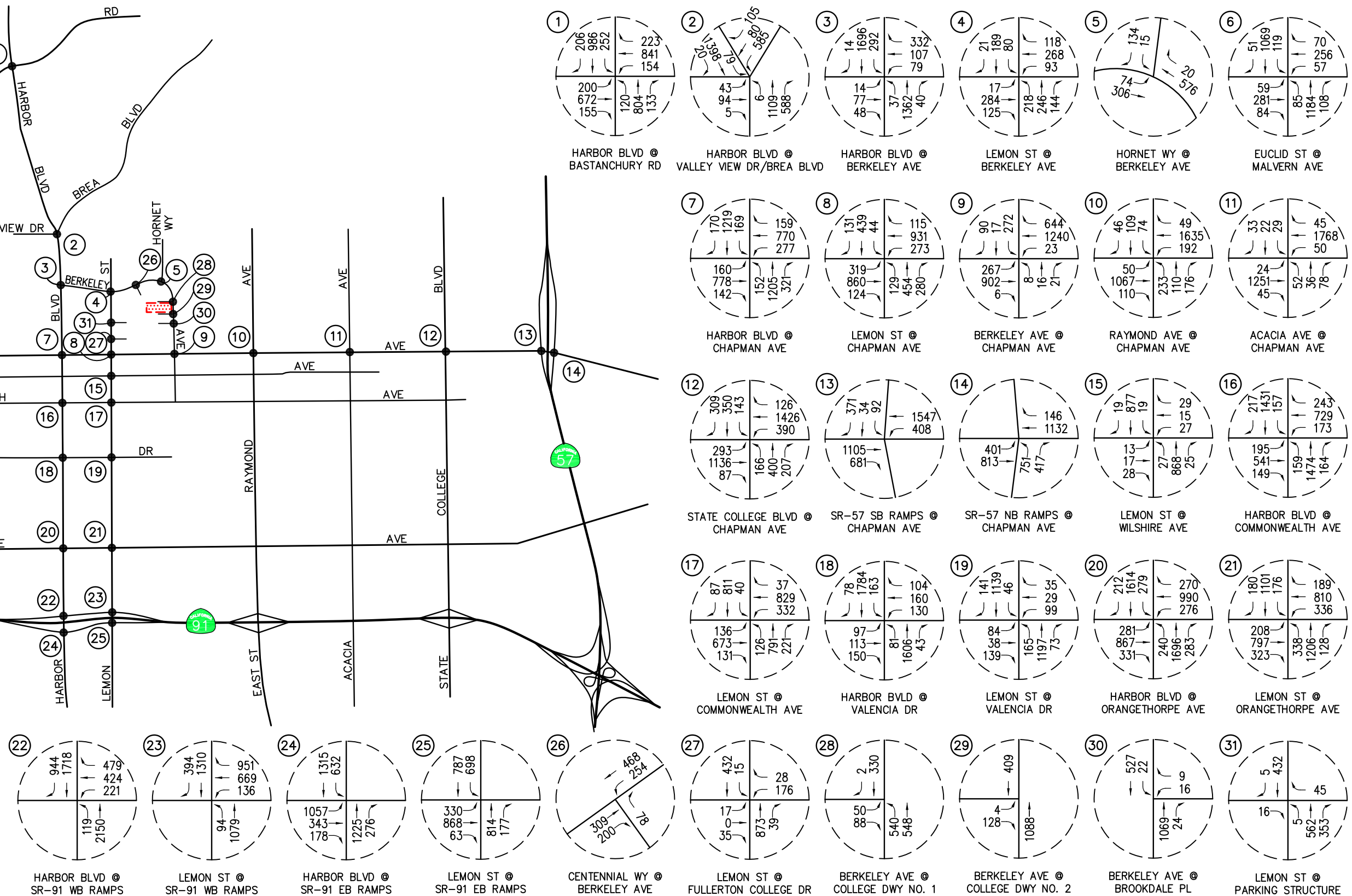
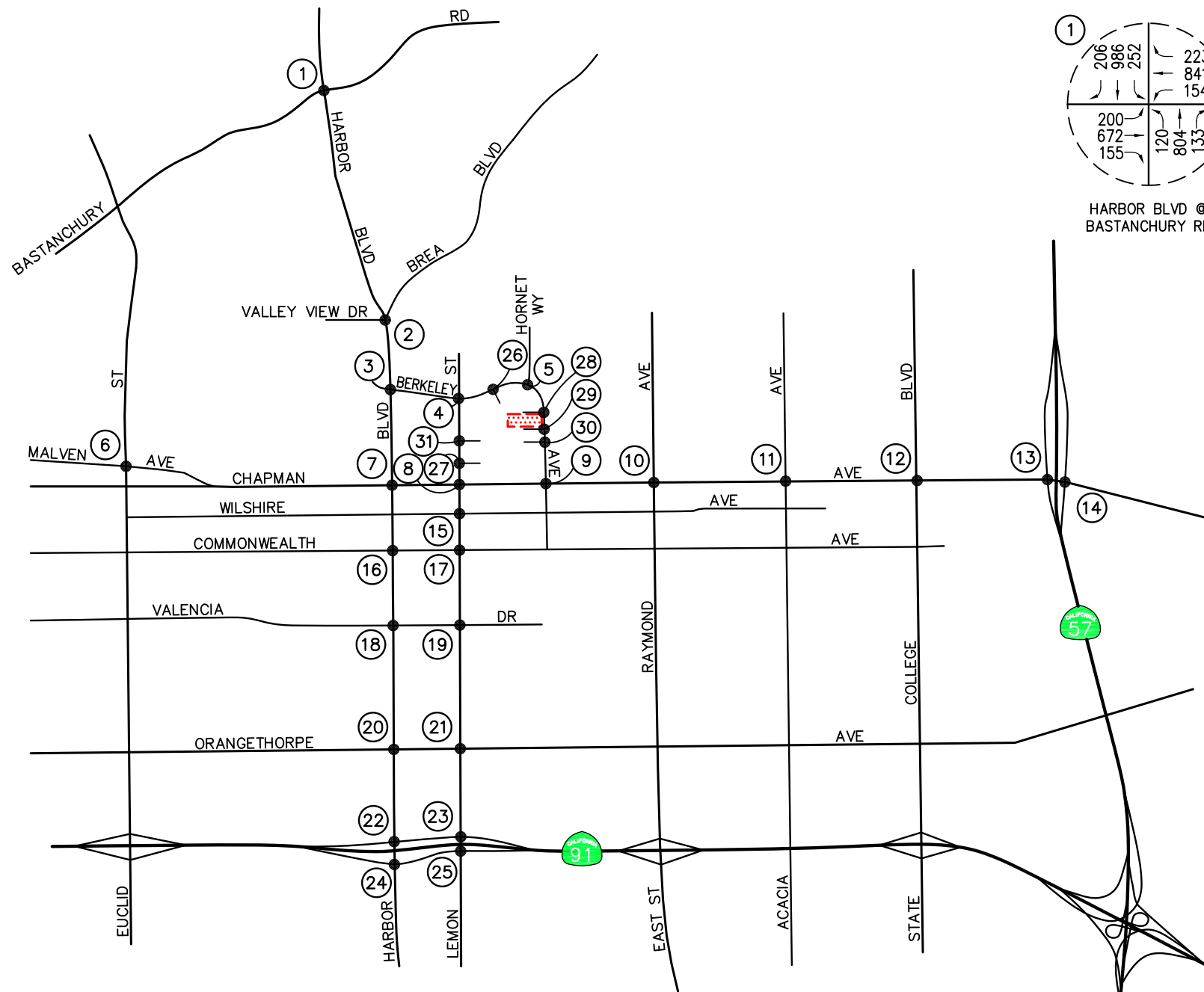
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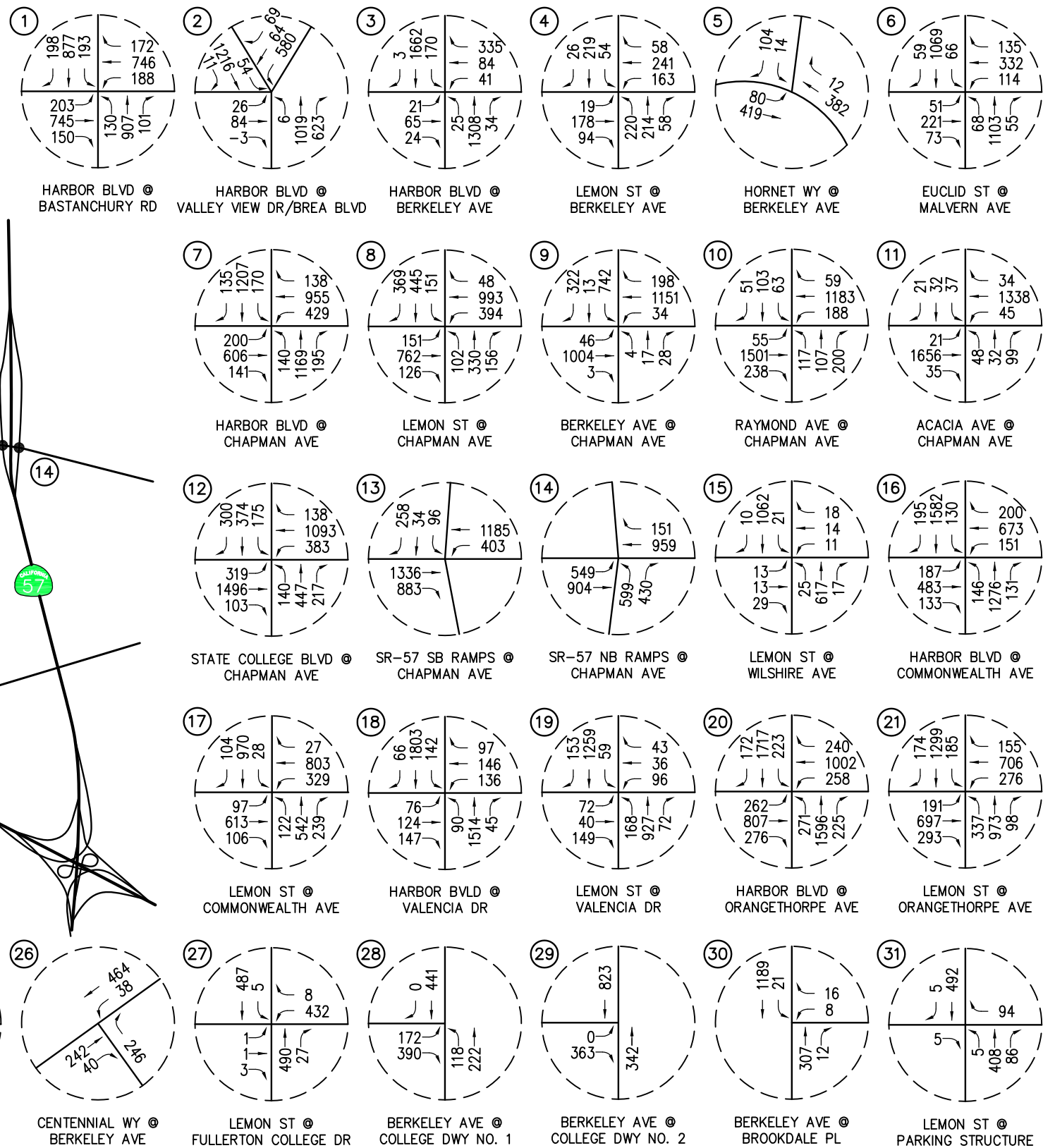
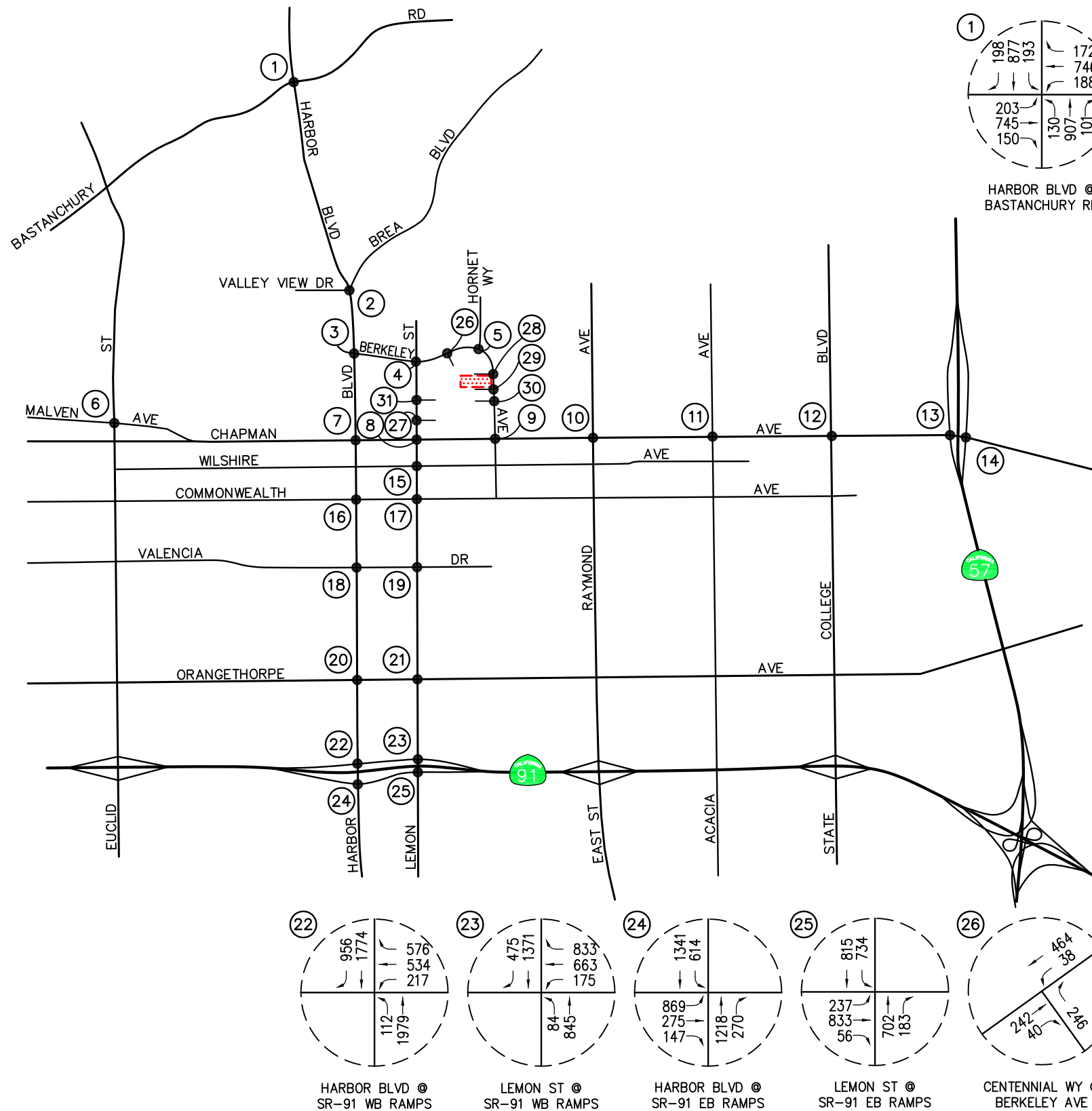
FIGURE 6-13

YEAR 2030 SATURDAY EVENT DEPARTURE PERIOD BUILDOUT TRAFFIC VOLUMES  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON









## 7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the proposed Project during the weekday PM peak hour, Saturday Event Arrival Period peak hour and Saturday Event Departure Period peak hour was evaluated based on analysis of future operating conditions at the thirty-one (31) key study intersections, without, then with, the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future delay/volume-to-capacity relationships and service level characteristics at each study intersection utilizing the Vistro software and HCM 6 Methodology. The significance of the potential impacts of the Project (i.e. direct or cumulative) at each key intersection was then evaluated using the following traffic impact criteria.

### 7.1 Significant Impact Criteria

In order to provide a quantitative basis for determining the significant traffic impact at a specific location, it was necessary to establish the criteria to be used in the analysis of intersections for this study. Based on the City of Fullerton traffic study guidelines, a project is considered to have a significant impact at an intersection if the following criteria are met:

- *For signalized intersections, an impact is considered to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F.*
- *For unsignalized intersections, an impact is considered to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F. However, unsignalized intersection LOS is based on the control delay, but that delay is only assessed for those traffic movements that are stopped or must yield to through traffic. Some movements, including cross traffic on the minor street or left turns onto the major street may be acceptable with relatively long delays, when through traffic and right turns from a major street do not experience any delays at stopped intersections. When delay for cross traffic is severe (LOS F), the intersection should be further evaluated for possible improvement with traffic signals. In some cases, this analysis determines that the delay is being experienced by a very low number of vehicles and traffic signals are not warranted. For this condition, the intersection does not need to be considered impacted, but measures to reduce delay may be considered, if appropriate. In other cases, the number of stopped vehicles is substantial and traffic signals may be justified as a mitigation measure. Therefore, the following significance criteria for unsignalized intersections are used:*
  - *An unsignalized intersection impact is considered to be significant if the project causes an intersection at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a signal is justified.*

It should be noted that although the City standard is LOS D, there are two intersections located in the Historic Downtown area where LOS E is deemed acceptable to the City because of the fully developed character of the downtown area, the presence of historic properties, and the great expense and hardship that would be caused by attempting to secure right-of-way required to improve LOS. The two intersections where LOS E is considered acceptable are: Harbor Boulevard/Chapman Avenue (i.e. key study intersection #6) and Harbor Boulevard/Commonwealth Avenue (i.e. key

study intersection #16). It should be further noted that LOS E is also considered acceptable at the CMP intersection of Harbor Boulevard/Orangethorpe Avenue (i.e. key study intersection #20).

## **7.2 Traffic Impact Analysis Scenarios**

The following scenarios are those for which LOS calculations have been performed at the thirty-one (31) key study intersections for Existing plus Project traffic conditions, Year 2020 plus Project traffic conditions and Year 2030 Buildout plus Project traffic conditions:

- A. Existing Traffic Conditions;
- B. Existing Plus Project Traffic Conditions;
- C. Scenario (B) with Improvements, if necessary;
- D. Year 2020 Cumulative Traffic Conditions;
- E. Year 2020 Cumulative Plus Project Traffic Conditions;
- F. Scenario (E) with Improvements, if necessary;
- G. Year 2030 Buildout Traffic Conditions,
- H. Year 2030 Buildout Plus Project Traffic Conditions; and
- I. Scenario (H) with Improvements, if necessary.

## 8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

### 8.1 Existing Plus Project Analysis – Weekday Academic Instruction

*Table 8-1* summarizes the weekday PM peak hour Level of Service results at the thirty-one (31) key study intersections for Existing plus Project (i.e. academic instruction) traffic conditions. The first column (1) of HCM/LOS values in *Table 8-1* presents a summary of existing weekday PM peak hour traffic conditions (which were also presented in *Table 3-3*). The second column (2) lists Existing plus Project (i.e. academic instruction) traffic conditions. The third column (3) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fourth column (4) of *Table 8-1* indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

Review of Columns 2 and 3 of *Table 8-1* indicates that traffic associated with the proposed Project (i.e. academic instruction) ***will not*** significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Bastanchury Road is forecast to operate at unacceptable LOS E during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining thirty (30) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the weekday PM peak hour with the addition of Project generated traffic to existing traffic.

*Appendix E* presents the Existing plus Project HCM/LOS weekday PM peak hour calculations for the thirty-one (31) key study intersections.

### 8.2 Existing Plus Project Analysis – Field Event

*Table 8-2* summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour Level of Service results at the thirty-one (31) key study intersections for Existing plus Project (i.e. field event) traffic conditions. The first column (1) of HCM/LOS values in *Table 8-2* presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions (which were also presented in *Table 3-4*). The second column (2) lists Existing plus Project (i.e. field event) traffic conditions. The third column (3) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fourth column (4) of *Table 8-2* indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

Review of Columns 2 and 3 of *Table 8-2* indicates that traffic associated with the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections,

when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-eight (28) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of Project generated traffic to existing traffic. The intersections operating at an adverse level of service under existing plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	72.4 s/v	E
28. Berkeley Avenue at College Driveway No. 1	---	---	72.2 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	85.4 s/v	F

As shown in column 4, the implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

*Appendix E* also presents the Existing plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the thirty-one (31) key study intersections.

### **8.3 Year 2020 Traffic Conditions – Weekday Academic Instruction**

**Table 8-3** summarizes the weekday PM peak hour Level of Service results at the thirty-one (31) key study intersections for Year 2020 traffic conditions. The first column (1) of HCM/LOS values in **Table 8-3** presents a summary of existing weekday PM peak hour traffic conditions (which were also presented in **Table 3-3** and **8-1**). The second column (2) lists projected Year 2020 traffic conditions (existing plus ambient growth plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2020 traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) of **Table 8-3** indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

#### **8.3.1 Year 2020 Traffic Conditions (Without Project) – Weekday Academic Instruction**

An analysis of future (Year 2020) traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will cumulatively impact one (1) of the thirty-one (31) key study intersections. The remaining thirty (30) key study intersections are forecast to operate at an acceptable service level during the weekday PM peak hour with the addition of ambient traffic growth and cumulative projects traffic. The intersections forecast to operate adversely in the Year 2020 consists of the following:

<u>Key Intersection</u>	<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>
1. Harbor Boulevard at Bastanchury Road	58.1 s/v	E

### 8.3.2 Year 2020 Plus Project Traffic Conditions – Weekday Academic Instruction

Review of Columns 3 and 4 of *Table 8-3* indicates that traffic associated with the proposed Project (i.e. academic instruction) ***will not*** significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Bastanchury Road is forecast to operate at unacceptable LOS E during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining thirty (30) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2020 traffic conditions.

**Appendix F** presents the Year 2020 plus Project HCM/LOS weekday PM peak hour calculations for the thirty-one (31) key study intersections.

## 8.4 Year 2020 Traffic Conditions – Saturday Field Event

**Table 8-4** summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour Level of Service results at the thirty-one (31) key study intersections for Year 2020 traffic conditions. The first column (1) of HCM/LOS values in *Table 8-4* presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions (which were also presented in *Table 3-4* and *8-2*). The second column (2) lists projected Year 2020 traffic conditions (existing plus ambient growth plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2020 traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) of *Table 8-4* indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

### 8.4.1 Year 2020 Traffic Conditions (Without Project) – Saturday Field Event

An analysis of future (Year 2020) Saturday cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative projects traffic will not adversely impact the thirty-one (31) key study intersections. The thirty-one (31) key study intersections are forecast to continue to operate at acceptable levels of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of ambient traffic growth and cumulative projects traffic.

#### 8.4.2 Year 2020 Plus Project Traffic Conditions – Saturday Field Event

Review of Columns 3 and 4 of *Table 8-3* indicates that traffic associated with the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-eight (28) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2020 traffic conditions. The intersections operating at an adverse level of service under Year 2020 plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	73.6 s/v	E
28. Berkeley Avenue at College Driveway No. 1	---	---	76.1 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	89.8 s/v	F

As shown in column 5, the implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

*Appendix F* also presents the Year 2020 plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the thirty-one (31) key study intersections.

#### 8.5 Year 2030 Traffic Conditions – Weekday Academic Instruction

*Table 8-5* summarizes the weekday PM peak hour Level of Service results at the thirty-one (31) key study intersections for the Year 2030 buildout year and is similar in setup to *Table 8-3*.

##### 8.5.1 Year 2030 Buildout Traffic Conditions (Without Project) – Weekday Academic Instruction

An analysis of future (Year 2030) buildout traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will cumulatively impact eleven (11) of the thirty-one (31) key study intersections. The remaining twenty (20) key study intersections are forecast to operate at an acceptable service level during the weekday PM peak hour with the addition of ambient traffic growth and cumulative projects traffic. The intersections forecast to operate adversely in the Year 2030 consist of the following:

<u>Key Intersection</u>	<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>
1. Harbor Boulevard at Bastanchury Road	89.2 s/v	F
3. Harbor Boulevard at Berkeley Avenue	67.2 s/v	E
6. Euclid Street at Malvern Avenue	74.0 s/v	E
7. Harbor Boulevard at Chapman Avenue	85.0 s/v	F
8. Lemon Street at Chapman Avenue	55.6 s/v	E



10. Raymond Avenue at Chapman Avenue	81.2 s/v	F
12. State College Boulevard at Chapman Avenue	128.0 s/v	F
14. SR-57 NB Ramps at Chapman Avenue	86.2 s/v	F
18. Harbor Boulevard at Valencia Drive	78.5 s/v	E
20. Harbor Boulevard at Orangethorpe Avenue	116.6 s/v	F
21. Lemon Street at Orangethorpe Avenue	91.1 s/v	F

### 8.5.2 Year 2030 Buildout Plus Project Traffic Conditions – Weekday Academic Instruction

Review of Columns 3 and 4 of *Table 8-5* indicates that traffic associated with the proposed Project (i.e. academic instruction) ***will not*** significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersections of Harbor Boulevard/Bastanchury Road, Harbor Boulevard/Berkeley Avenue, Euclid Street/Malvern Avenue, Harbor Boulevard/Chapman Avenue, Lemon Street/Chapman Avenue, Raymond Avenue/Chapman Avenue, State College Boulevard/Chapman Avenue, SR-57 NB Ramps/Chapman Avenue, Harbor Boulevard/Valencia Drive, Harbor Boulevard/Orangethorpe Avenue and Lemon Street/Orangethorpe are forecast to operate at unacceptable LOS E or LOS F during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining twenty (20) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2030 Buildout traffic conditions.

**Appendix G** presents the Year 2030 Buildout plus Project HCM/LOS weekday PM peak hour calculations for the thirty-one (31) key study intersections.

## 8.6 Year 2030 Traffic Conditions – Saturday Field Event

**Table 8-6** summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour Level of Service results at the thirty-one (31) key study intersections for the Year 2030 buildout year and is similar in setup to *Table 8-4*.

### 8.6.1 Year 2030 Buildout Traffic Conditions (Without Project) – Saturday Field Event

An analysis of future (Year 2030) Saturday buildout traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will cumulatively impact one (1) of the thirty-one (31) key study intersections. The remaining thirty (30) key study intersections are forecast to operate at an acceptable service level during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of ambient traffic growth and cumulative projects traffic. The intersection forecast to operate adversely in the Year 2030 consists of the following:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
20. Harbor Boulevard at Orangethorpe Avenue	92.1 s/v	F	81.7 s/v	F

### 8.6.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event

Review of Columns 3 and 4 of *Table 8-6* indicates that traffic associated with the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Orangethorpe Avenue is forecast to operate at unacceptable LOS F during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining twenty-six (26) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2030 Buildout traffic conditions. The intersections operating at an adverse level of service under Year 2030 Buildout plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	72.9 s/v	E
12. State College Boulevard at Chapman Avenue	66.4 s/v	E	89.4 s/v	F
28. Berkeley Avenue at College Driveway No. 1	124.2 s/v	F	114.1 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	113.6 s/v	F

As shown in column 5, the implementation of improvements at the impacted key study intersection of State College Boulevard/Chapman Avenue completely offsets the impact of project traffic. The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

*Appendix G* also presents the Year 2030 Buildout plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the thirty-one (31) key study intersections.

**TABLE 8-1**  
**EXISTING PLUS PROJECT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Weekday PM	<b>57.0 s/v</b>	<b>E</b>	<b>57.0 s/v</b>	<b>E</b>	0.0 s/v	No	--	--
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Weekday PM	30.0 s/v	C	30.1 s/v	C	0.1 s/v	No	--	--
3. Harbor Boulevard at Berkeley Avenue	D	Weekday PM	30.9 s/v	C	30.9 s/v	C	0.0 s/v	No	--	--
4. Lemon Street at Berkeley Avenue	D	Weekday PM	38.6 s/v	D	38.6 s/v	D	0.0 s/v	No	--	--
5. Hornet Way at Berkeley Avenue	D	Weekday PM	13.4 s/v	B	13.4 s/v	B	0.0 s/v	No	--	--
6. Euclid Street at Malvern Avenue	D	Weekday PM	34.0 s/v	C	34.1 s/v	C	0.1 s/v	No	--	--
7. Harbor Boulevard at Chapman Avenue	E	Weekday PM	31.5 s/v	C	31.7 s/v	C	0.2 s/v	No	--	--
8. Lemon Street at Chapman Avenue	D	Weekday PM	34.2 s/v	C	34.5 s/v	C	0.3 s/v	No	--	--
9. Berkeley Avenue at Chapman Avenue	D	Weekday PM	18.0 s/v	B	18.0 s/v	B	0.0 s/v	No	--	--
10. Raymond Avenue at Chapman Avenue	D	Weekday PM	26.2 s/v	C	26.4 s/v	C	0.2 s/v	No	--	--
11. Acacia Avenue at Chapman Avenue	D	Weekday PM	18.1 s/v	B	18.1 s/v	B	0.0 s/v	No	--	--
12. State College Blvd at Chapman Avenue	D	Weekday PM	35.8 s/v	D	35.9 s/v	D	0.1 s/v	No	--	--
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	18.2 s/v	B	18.3 s/v	B	0.1 s/v	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	26.5 s/v	C	26.5 s/v	C	0.0 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

**TABLE 8-1 (CONTINUED)**  
**EXISTING PLUS PROJECT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
15. Lemon Street at Wilshire Avenue	D	Weekday PM	10.3 s/v	B	10.3 s/v	B	0.0 s/v	No	--	--
16. Harbor Boulevard at Commonwealth Ave	E	Weekday PM	30.8 s/v	C	30.9 s/v	C	0.1 s/v	No	--	--
17. Lemon Street at Commonwealth Ave	D	Weekday PM	33.9 s/v	C	33.9 s/v	C	0.0 s/v	No	--	--
18. Harbor Boulevard at Valencia Drive	D	Weekday PM	26.5 s/v	C	26.6 s/v	C	0.1 s/v	No	--	--
19. Lemon Street at Valencia Drive	D	Weekday PM	10.1 s/v	B	10.1 s/v	B	0.0 s/v	No	--	--
20. Harbor Boulevard at Orangethorpe Avenue	E	Weekday PM	38.8 s/v	D	38.9 s/v	D	0.1 s/v	No	--	--
21. Lemon Street at Orangethorpe Avenue	D	Weekday PM	36.6 s/v	D	36.6 s/v	D	0.0 s/v	No	--	--
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	17.2 s/v	B	17.2 s/v	B	0.0 s/v	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	24.5 s/v	C	24.6 s/v	C	0.1 s/v	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	19.6 s/v	B	19.7 s/v	B	0.1 s/v	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	23.0 s/v	C	23.1 s/v	C	0.1 s/v	No	--	--
26. Centennial Way at Berkeley Avenue	D	Weekday PM	12.5 s/v	B	12.5 s/v	B	0.0 s/v	No	--	--
27. Lemon Street at Fullerton College Dr	D	Weekday PM	16.0 s/v	B	16.0 s/v	B	0.0 s/v	No	--	--
28. Berkeley Avenue at College Dwy No. 1	D	Weekday PM	12.9 s/v	B	13.1 s/v	B	0.2 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

TABLE 8-1 (CONTINUED)

## EXISTING PLUS PROJECT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
29. Berkeley Avenue at College Dwy No. 2	D	Weekday PM	12.3 s/v	B	12.3 s/v	B	0.0 s/v	No	--	--
30. Berkeley Avenue at Brookdale Place	D	Weekday PM	13.9 s/v	B	14.3 s/v	B	0.4 s/v	No	--	--
31. Lemon Street at Parking Structure	D	Weekday PM	16.4 s/v	C	16.7 s/v	C	0.3 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

**TABLE 8-2**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Sat. Arrival Sat. Departure	35.5 s/v 35.0 s/v	D C	36.3 s/v 35.3 s/v	D D	0.8 s/v 0.3 s/v	No No	-- --	-- --
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Sat. Arrival Sat. Departure	26.7 s/v 26.8 s/v	C C	27.1 s/v 26.8 s/v	C C	0.4 s/v 0.0 s/v	No No	-- --	-- --
3. Harbor Boulevard at Berkeley Avenue	D	Sat. Arrival Sat. Departure	19.7 s/v 16.5 s/v	B B	21.2 s/v 19.0 s/v	C B	1.5 s/v 2.5 s/v	No No	-- --	-- --
4. Lemon Street at Berkeley Avenue	D	Sat. Arrival Sat. Departure	34.8 s/v 33.9 s/v	C C	36.4 s/v <b>72.4 s/v</b>	D <b>E</b>	1.6 s/v <b>38.5 s/v</b>	No <b>Yes</b>	-- 18.1 s/v	-- B
5. Hornet Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	11.5 s/v 14.0 s/v	B B	10.8 s/v 9.6 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
6. Euclid Street at Malvern Avenue	D	Sat. Arrival Sat. Departure	11.0 s/v 10.9 s/v	B B	14.5 s/v 16.5 s/v	B B	3.5 s/v 5.6 s/v	No No	-- --	-- --
7. Harbor Boulevard at Chapman Avenue	E	Sat. Arrival Sat. Departure	26.5 s/v 26.5 s/v	C C	28.6 s/v 30.0 s/v	C C	2.1 s/v 3.5 s/v	No No	-- --	-- --
8. Lemon Street at Chapman Avenue	D	Sat. Arrival Sat. Departure	33.1 s/v 32.9 s/v	C C	33.4 s/v 33.3 s/v	C C	0.3 s/v 0.4 s/v	No No	-- --	-- --
9. Berkeley Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	10.0 s/v 9.5 s/v	A A	13.4 s/v 23.2 s/v	B C	3.4 s/v 13.7 s/v	No No	-- --	-- --
10. Raymond Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	19.5 s/v 18.5 s/v	B B	21.1 s/v 18.5 s/v	C B	1.6 s/v 0.0 s/v	No No	-- --	-- --
11. Acacia Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	8.7 s/v 10.7 s/v	A B	8.1 s/v 9.6 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
12. State College Blvd at Chapman Avenue	D	Sat. Arrival Sat. Departure	37.1 s/v 36.9 s/v	D D	37.3 s/v 35.3 s/v	D D	0.2 s/v 0.0 s/v	No No	-- --	-- --
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	17.6 s/v 18.4 s/v	B B	20.2 s/v 19.3 s/v	C B	2.6 s/v 0.9 s/v	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	25.2 s/v 26.7 s/v	C C	28.0 s/v 29.4 s/v	C C	2.8 s/v 2.7 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

**TABLE 8-2 (CONTINUED)**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
15. Lemon Street at Wilshire Avenue	D	Sat. Arrival Sat. Departure	6.5 s/v 5.0 s/v	A A	5.7 s/v 4.4 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
16. Harbor Boulevard at Commonwealth Ave	E	Sat. Arrival Sat. Departure	30.8 s/v 30.4 s/v	C C	30.1 s/v 30.7 s/v	C C	0.0 s/v 0.3 s/v	No No	-- --	-- --
17. Lemon Street at Commonwealth Ave	D	Sat. Arrival Sat. Departure	32.4 s/v 32.4 s/v	C C	33.5 s/v 32.5 s/v	C C	1.1 s/v 0.1 s/v	No No	-- --	-- --
18. Harbor Boulevard at Valencia Drive	D	Sat. Arrival Sat. Departure	11.5 s/v 11.6 s/v	B B	11.5 s/v 11.6 s/v	B B	0.0 s/v 0.0 s/v	No No	-- --	-- --
19. Lemon Street at Valencia Drive	D	Sat. Arrival Sat. Departure	10.5 s/v 11.0 s/v	B B	10.0 s/v 10.4 s/v	B B	0.0 s/v 0.0 s/v	No No	-- --	-- --
20. Harbor Boulevard at Orangethorpe Avenue	E	Sat. Arrival Sat. Departure	39.2 s/v 38.0 s/v	D D	41.9 s/v 38.4 s/v	D D	2.7 s/v 0.4 s/v	No No	-- --	-- --
21. Lemon Street at Orangethorpe Avenue	D	Sat. Arrival Sat. Departure	34.1 s/v 32.9 s/v	C C	35.2 s/v 33.5 s/v	D C	1.1 s/v 0.6 s/v	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	17.3 s/v 20.1 s/v	B C	17.4 s/v 21.1 s/v	B C	0.1 s/v 1.0 s/v	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	27.7 s/v 24.8 s/v	C C	29.5 s/v 26.2 s/v	C C	1.8 s/v 1.4 s/v	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	23.6 s/v 22.4 s/v	C C	24.4 s/v 22.5 s/v	C C	0.8 s/v 0.1 s/v	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	27.8 s/v 27.8 s/v	C C	29.1 s/v 28.2 s/v	C C	1.3 s/v 0.4 s/v	No No	-- --	-- --
26. Centennial Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	10.2 s/v 9.7 s/v	B A	10.7 s/v 11.7 s/v	B B	0.5 s/v 2.0 s/v	No No	-- --	-- --
27. Lemon Street at Fullerton College Dr	D	Sat. Arrival Sat. Departure	14.4 s/v 4.9 s/v	B A	14.5 s/v 20.0 s/v	B B	0.1 s/v 15.1 s/v	No No	-- --	-- --
28. Berkeley Avenue at College Dwy No. 1	D	Sat. Arrival Sat. Departure	11.2 s/v 10.4 s/v	B B	27.6 s/v <b>72.2 s/v</b>	D <b>F</b>	16.4 s/v <b>61.8 s/v</b>	No <b>Yes</b>	-- 16.1 s/v	-- B

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

**TABLE 8-2 (CONTINUED)**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
29. Berkeley Avenue at College Dwy No. 2	D	Sat. Arrival Sat. Departure	10.7 s/v 9.8 s/v	B A	14.7 s/v <b>85.4 s/v</b>	B <b>F</b>	4.0 s/v <b>75.6 s/v</b>	No <b>Yes</b>	-- 14.5 s/v	-- B
30. Berkeley Avenue at Brookdale Place	D	Sat. Arrival Sat. Departure	11.7 s/v 9.9 s/v	B A	22.4 s/v 13.7 s/v	C B	10.7 s/v 3.8 s/v	No No	-- --	-- --
31. Lemon Street at Parking Structure	D	Sat. Arrival Sat. Departure	10.1 s/v 9.5 s/v	B A	12.2 s/v 10.2 s/v	B B	2.1 s/v 0.7 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle



**TABLE 8-3**  
**YEAR 2020 WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Weekday PM	<b>57.0 s/v</b>	<b>E</b>	<b>58.1 s/v</b>	<b>E</b>	<b>58.1 s/v</b>	<b>E</b>	0.0 s/v	No	--	--
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Weekday PM	30.0 s/v	C	30.5 s/v	C	30.5 s/v	C	0.0 s/v	No	--	--
3. Harbor Boulevard at Berkeley Avenue	D	Weekday PM	30.9 s/v	C	31.9 s/v	C	32.0 s/v	C	0.1 s/v	No	--	--
4. Lemon Street at Berkeley Avenue	D	Weekday PM	38.6 s/v	D	39.2 s/v	D	39.2 s/v	D	0.0 s/v	No	--	--
5. Hornet Way at Berkeley Avenue	D	Weekday PM	13.4 s/v	B	13.4 s/v	B	13.4 s/v	B	0.0 s/v	No	--	--
6. Euclid Street at Malvern Avenue	D	Weekday PM	34.0 s/v	C	35.5 s/v	D	35.6 s/v	D	0.1 s/v	No	--	--
7. Harbor Boulevard at Chapman Avenue	E	Weekday PM	31.5 s/v	C	35.6 s/v	D	35.8 s/v	D	0.2 s/v	No	--	--
8. Lemon Street at Chapman Avenue	D	Weekday PM	34.2 s/v	C	34.8 s/v	C	35.2 s/v	D	0.4 s/v	No	--	--
9. Berkeley Avenue at Chapman Avenue	D	Weekday PM	18.0 s/v	B	18.3 s/v	B	18.3 s/v	B	0.0 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-3 (CONTINUED)**  
**YEAR 2020 WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
10. Raymond Avenue at Chapman Avenue	D	Weekday PM	26.2 s/v	C	26.8 s/v	C	27.0 s/v	C	0.2 s/v	No	--	--
11. Acacia Avenue at Chapman Avenue	D	Weekday PM	18.1 s/v	B	18.3 s/v	B	18.3 s/v	B	0.0 s/v	No	--	--
12. State College Boulevard at Chapman Avenue	D	Weekday PM	35.8 s/v	D	36.1 s/v	D	36.2 s/v	D	0.1 s/v	No	--	--
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	18.2 s/v	B	18.5 s/v	B	18.5 s/v	B	0.0 s/v	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	26.5 s/v	C	27.0 s/v	C	27.1 s/v	C	0.1 s/v	No	--	--
15. Lemon Street at Wilshire Avenue	D	Weekday PM	10.3 s/v	B	10.4 s/v	B	10.4 s/v	B	0.0 s/v	No	--	--
16. Harbor Boulevard at Commonwealth Avenue	E	Weekday PM	30.8 s/v	C	31.1 s/v	C	31.1 s/v	C	0.0 s/v	No	--	--
17. Lemon Street at Commonwealth Avenue	D	Weekday PM	33.9 s/v	C	34.0 s/v	C	35.1 s/v	D	1.1 s/v	No	--	--
18. Harbor Boulevard at Valencia Drive	D	Weekday PM	26.5 s/v	C	28.4 s/v	C	28.4 s/v	C	0.0 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-3 (CONTINUED)**  
**YEAR 2020 WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
19. Lemon Street at Valencia Drive	D	Weekday PM	10.1 s/v	B	10.2 s/v	B	10.2 s/v	B	0.0 s/v	No	--	--
20. Harbor Boulevard at Orangethorpe Avenue	E	Weekday PM	38.8 s/v	D	41.2 s/v	D	41.4 s/v	D	0.2 s/v	No	--	--
21. Lemon Street at Orangethorpe Avenue	D	Weekday PM	36.6 s/v	D	38.3 s/v	D	38.3 s/v	D	0.0 s/v	No	--	--
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	17.2 s/v	B	17.7 s/v	B	17.7 s/v	B	0.0 s/v	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	24.5 s/v	C	25.0 s/v	C	25.0 s/v	C	0.0 s/v	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	19.6 s/v	B	19.9 s/v	B	20.0 s/v	C	0.1 s/v	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	23.0 s/v	C	23.3 s/v	C	23.3 s/v	C	0.0 s/v	No	--	--
26. Centennial Way at Berkeley Avenue	D	Weekday PM	12.5 s/v	B	12.6 s/v	B	12.6 s/v	B	0.0 s/v	No	--	--
27. Lemon Street at Fullerton College Drive	D	Weekday PM	16.0 s/v	B	16.5 s/v	B	16.5 s/v	C	0.0 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

TABLE 8-3 (CONTINUED)

## YEAR 2020 WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
28. Berkeley Avenue at College Driveway No. 1	D	Weekday PM	12.9 s/v	B	13.1 s/v	B	13.4 s/v	B	0.3 s/v	No	--	--
29. Berkeley Avenue at College Driveway No. 2	D	Weekday PM	12.3 s/v	B	12.5 s/v	B	12.5 s/v	B	0.0 s/v	No	--	--
30. Berkeley Avenue at Brookdale Place	D	Weekday PM	13.9 s/v	B	14.2 s/v	B	14.7 s/v	B	0.5 s/v	No	--	--
31. Lemon Street at Parking Structure	D	Weekday PM	16.4 s/v	C	17.1 s/v	C	17.5 s/v	C	0.4 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-4**  
**YEAR 2020 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Sat. Arrival Sat. Departure	35.5 s/v 35.0 s/v	D C	35.6 s/v 35.0 s/v	D C	36.6 s/v 35.3 s/v	D D	1.0 s/v 0.3 s/v	No No	-- --	-- --
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Sat. Arrival Sat. Departure	26.7 s/v 26.8 s/v	C C	26.8 s/v 26.8 s/v	C C	27.1 s/v 27.3 s/v	C C	0.3 s/v 0.5 s/v	No No	-- --	-- --
3. Harbor Boulevard at Berkeley Avenue	D	Sat. Arrival Sat. Departure	19.7 s/v 16.5 s/v	B B	19.9 s/v 16.6 s/v	B B	21.4 s/v 19.1 s/v	C B	1.5 s/v 2.5 s/v	No No	-- --	-- --
4. Lemon Street at Berkeley Avenue	D	Sat. Arrival Sat. Departure	34.8 s/v 33.9 s/v	C C	34.9 s/v 34.0 s/v	C C	36.8 s/v <b>73.6 s/v</b>	D <b>E</b>	1.9 s/v <b>39.6 s/v</b>	No <b>Yes</b>	-- 21.5 s/v	-- C
5. Hornet Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	11.5 s/v 14.0 s/v	B B	11.5 s/v 14.0 s/v	B B	10.8 s/v 9.7 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
6. Euclid Street at Malvern Avenue	D	Sat. Arrival Sat. Departure	11.0 s/v 10.9 s/v	B B	11.3 s/v 11.1 s/v	B B	14.7 s/v 16.7 s/v	B B	3.4 s/v 5.6 s/v	No No	-- --	-- --
7. Harbor Boulevard at Chapman Avenue	E	Sat. Arrival Sat. Departure	26.5 s/v 26.5 s/v	C C	26.7 s/v 26.7 s/v	C C	28.4 s/v 30.3 s/v	C C	1.7 s/v 3.6 s/v	No No	-- --	-- --
8. Lemon Street at Chapman Avenue	D	Sat. Arrival Sat. Departure	33.1 s/v 32.9 s/v	C C	33.2 s/v 33.0 s/v	C C	33.5 s/v 33.6 s/v	C C	0.3 s/v 0.6 s/v	No No	-- --	-- --
9. Berkeley Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	10.0 s/v 9.5 s/v	A A	10.1 s/v 9.7 s/v	B A	13.6 s/v 23.2 s/v	B C	3.5 s/v 13.5 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-4 (CONTINUED)**  
**YEAR 2020 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
10. Raymond Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	19.5 s/v 18.5 s/v	B B	19.6 s/v 18.6 s/v	B B	19.9 s/v 18.7 s/v	B B	0.3 s/v 0.1 s/v	No No	-- --	-- --
11. Acacia Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	8.7 s/v 10.7 s/v	A B	8.7 s/v 10.7 s/v	A B	8.1 s/v 9.6 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
12. State College Boulevard at Chapman Avenue	D	Sat. Arrival Sat. Departure	37.1 s/v 36.9 s/v	D D	37.2 s/v 36.9 s/v	D D	37.7 s/v 36.9 s/v	D D	0.5 s/v 0.0 s/v	No No	-- --	-- --
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	17.6 s/v 18.4 s/v	B B	17.7 s/v 18.5 s/v	B B	20.3 s/v 19.6 s/v	C B	2.6 s/v 1.1 s/v	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	25.2 s/v 26.7 s/v	C C	25.4 s/v 26.8 s/v	C C	28.2 s/v 29.6 s/v	C C	2.8 s/v 2.8 s/v	No No	-- --	-- --
15. Lemon Street at Wilshire Avenue	D	Sat. Arrival Sat. Departure	6.5 s/v 5.0 s/v	A A	6.4 s/v 4.9 s/v	A A	5.7 s/v 4.4 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
16. Harbor Boulevard at Commonwealth Avenue	E	Sat. Arrival Sat. Departure	30.8 s/v 30.4 s/v	C C	30.8 s/v 30.6 s/v	C C	32.0 s/v 30.8 s/v	C C	1.2 s/v 0.2 s/v	No No	-- --	-- --
17. Lemon Street at Commonwealth Avenue	D	Sat. Arrival Sat. Departure	32.4 s/v 32.4 s/v	C C	32.9 s/v 32.8 s/v	C C	33.5 s/v 37.0 s/v	C D	0.6 s/v 4.2 s/v	No No	-- --	-- --
18. Harbor Boulevard at Valencia Drive	D	Sat. Arrival Sat. Departure	11.5 s/v 11.6 s/v	B B	11.6 s/v 11.7 s/v	B B	11.6 s/v 11.8 s/v	B B	0.0 s/v 0.1 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-4 (CONTINUED)**  
**YEAR 2020 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
19. Lemon Street at Valencia Drive	D	Sat. Arrival Sat. Departure	10.5 s/v 11.0 s/v	B B	10.6 s/v 11.1 s/v	B B	10.1 s/v 10.4 s/v	B B	0.0 s/v 0.0 s/v	No No	-- --	-- --
20. Harbor Boulevard at Orangethorpe Avenue	E	Sat. Arrival Sat. Departure	39.2 s/v 38.0 s/v	D D	41.7 s/v 38.6 s/v	D D	46.2 s/v 39.4 s/v	D D	4.5 s/v 0.8 s/v	No No	-- --	-- --
21. Lemon Street at Orangethorpe Avenue	D	Sat. Arrival Sat. Departure	34.1 s/v 32.9 s/v	C C	34.1 s/v 33.0 s/v	C C	35.5 s/v 37.4 s/v	D D	1.4 s/v 4.4 s/v	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	17.3 s/v 20.1 s/v	B C	17.8 s/v 20.7 s/v	B C	17.8 s/v 21.9 s/v	B C	0.0 s/v 1.2 s/v	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	27.7 s/v 24.8 s/v	C C	28.9 s/v 25.1 s/v	C C	31.0 s/v 26.7 s/v	C C	2.1 s/v 1.6 s/v	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	23.6 s/v 22.4 s/v	C C	23.8 s/v 22.5 s/v	C C	24.6 s/v 22.5 s/v	C C	0.8 s/v 0.0 s/v	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	27.8 s/v 27.8 s/v	C C	28.1 s/v 28.0 s/v	C C	29.4 s/v 28.5 s/v	C C	1.3 s/v 0.5 s/v	No No	-- --	-- --
26. Centennial Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	10.2 s/v 9.7 s/v	B A	10.3 s/v 9.7 s/v	B A	10.7 s/v 11.8 s/v	B B	0.4 s/v 2.1 s/v	No No	-- --	-- --
27. Lemon Street at Fullerton College Drive	D	Sat. Arrival Sat. Departure	14.4 s/v 4.9 s/v	B A	14.3 s/v 5.1 s/v	B A	14.7 s/v 20.0 s/v	B B	0.4 s/v 14.9 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-4 (CONTINUED)**  
**YEAR 2020 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
28. Berkeley Avenue at College Driveway No. 1	D	Sat. Arrival Sat. Departure	11.2 s/v 10.4 s/v	B B	11.3 s/v 10.5 s/v	B B	28.3 s/v <b>76.1 s/v</b>	D F	17.0 s/v <b>65.6 s/v</b>	No Yes	-- 16.1 s/v	-- B
29. Berkeley Avenue at College Driveway No. 2	D	Sat. Arrival Sat. Departure	10.7 s/v 9.8 s/v	B A	10.8 s/v 9.8 s/v	B A	14.9 s/v <b>89.8 s/v</b>	B F	4.1 s/v <b>80.0 s/v</b>	No Yes	-- 14.6 s/v	-- B
30. Berkeley Avenue at Brookdale Place	D	Sat. Arrival Sat. Departure	11.7 s/v 9.9 s/v	B A	11.9 s/v 10.0 s/v	B B	22.7 s/v 13.8 s/v	C B	10.8 s/v 3.8 s/v	No No	-- --	-- --
31. Lemon Street at Parking Structure	D	Sat. Arrival Sat. Departure	10.1 s/v 9.5 s/v	B A	10.1 s/v 9.6 s/v	B A	12.3 s/v 10.2 s/v	B B	2.2 s/v 0.6 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle



**TABLE 8-5**  
**YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Weekday PM	<b>57.0 s/v</b>	<b>E</b>	<b>89.2 s/v</b>	<b>F</b>	<b>89.3 s/v</b>	<b>F</b>	0.1 s/v	No	--	--
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Weekday PM	30.0 s/v	C	36.9 s/v	D	37.0 s/v	D	0.1 s/v	No	--	--
3. Harbor Boulevard at Berkeley Avenue	D	Weekday PM	30.9 s/v	C	<b>67.2 s/v</b>	<b>E</b>	<b>67.9 s/v</b>	<b>E</b>	0.7 s/v	No	--	--
4. Lemon Street at Berkeley Avenue	D	Weekday PM	38.6 s/v	D	41.1 s/v	D	41.2 s/v	D	0.1 s/v	No	--	--
5. Hornet Way at Berkeley Avenue	D	Weekday PM	13.4 s/v	B	13.3 s/v	B	13.2 s/v	B	0.0 s/v	No	--	--
6. Euclid Street at Malvern Avenue	D	Weekday PM	34.0 s/v	C	<b>74.0 s/v</b>	<b>E</b>	<b>74.4 s/v</b>	<b>E</b>	0.4 s/v	No	--	--
7. Harbor Boulevard at Chapman Avenue	E	Weekday PM	31.5 s/v	C	<b>85.0 s/v</b>	<b>F</b>	<b>95.7 s/v</b>	<b>F</b>	10.7 s/v	No	--	--
8. Lemon Street at Chapman Avenue	D	Weekday PM	34.2 s/v	C	<b>55.6 s/v</b>	<b>E</b>	<b>58.3 s/v</b>	<b>E</b>	2.7 s/v	No	--	--
9. Berkeley Avenue at Chapman Avenue	D	Weekday PM	18.0 s/v	B	25.0 s/v	C	25.1 s/v	C	0.1 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

TABLE 8-5 (CONTINUED)

## YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
10. Raymond Avenue at Chapman Avenue	D	Weekday PM	26.2 s/v	C	<b>81.2 s/v</b>	<b>F</b>	<b>83.0 s/v</b>	<b>F</b>	1.8 s/v	No	--	--
11. Acacia Avenue at Chapman Avenue	D	Weekday PM	18.1 s/v	B	29.9 s/v	C	30.5 s/v	C	0.6 s/v	No	--	--
12. State College Boulevard at Chapman Avenue	D	Weekday PM	35.8 s/v	D	<b>128.0 s/v</b>	<b>F</b>	<b>131.4 s/v</b>	<b>F</b>	3.4 s/v	No	--	--
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	18.2 s/v	B	30.9 s/v	C	31.1 s/v	C	0.2 s/v	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	26.5 s/v	C	<b>86.2 s/v</b>	<b>F</b>	<b>87.0 s/v</b>	<b>F</b>	0.8 s/v	No	--	--
15. Lemon Street at Wilshire Avenue	D	Weekday PM	10.3 s/v	B	10.6 s/v	B	10.6 s/v	B	0.0 s/v	No	--	--
16. Harbor Boulevard at Commonwealth Avenue	E	Weekday PM	30.8 s/v	C	61.6 s/v	E	61.6 s/v	E	0.0 s/v	No	--	--
17. Lemon Street at Commonwealth Avenue	D	Weekday PM	33.9 s/v	C	51.6 s/v	D	51.7 s/v	D	0.1 s/v	No	--	--
18. Harbor Boulevard at Valencia Drive	D	Weekday PM	26.5 s/v	C	<b>78.5 s/v</b>	<b>E</b>	<b>78.5 s/v</b>	<b>E</b>	0.0 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

TABLE 8-5 (CONTINUED)

## YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
19. Lemon Street at Valencia Drive	D	Weekday PM	10.1 s/v	B	15.0 s/v	B	15.0 s/v	B	0.0 s/v	No	--	--
20. Harbor Boulevard at Orangethorpe Avenue	E	Weekday PM	38.8 s/v	D	<b>116.6 s/v</b>	<b>F</b>	<b>117.2 s/v</b>	<b>F</b>	0.6 s/v	No	--	--
21. Lemon Street at Orangethorpe Avenue	D	Weekday PM	36.6 s/v	D	<b>91.1 s/v</b>	<b>F</b>	<b>91.9 s/v</b>	<b>F</b>	0.8 s/v	No	--	--
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	17.2 s/v	B	30.4 s/v	C	30.4 s/v	C	0.0 s/v	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	24.5 s/v	C	40.9 s/v	D	41.1 s/v	D	0.2 s/v	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	19.6 s/v	B	25.6 s/v	C	25.7 s/v	C	0.1 s/v	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	23.0 s/v	C	29.1 s/v	C	29.2 s/v	C	0.1 s/v	No	--	--
26. Centennial Way at Berkeley Avenue	D	Weekday PM	12.5 s/v	B	13.4 s/v	B	13.4 s/v	B	0.0 s/v	No	--	--
27. Lemon Street at Fullerton College Drive	D	Weekday PM	16.0 s/v	B	18.0 s/v	B	18.1 s/v	B	0.1 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

TABLE 8-5 (CONTINUED)

## YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – ACADEMIC INSTRUCTION

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
28. Berkeley Avenue at College Driveway No. 1	D	Weekday PM	12.9 s/v	B	16.3 s/v	C	17.4 s/v	C	1.1 s/v	No	--	--
29. Berkeley Avenue at College Driveway No. 2	D	Weekday PM	12.3 s/v	B	13.5 s/v	B	13.6 s/v	B	0.1 s/v	No	--	--
30. Berkeley Avenue at Brookdale Place	D	Weekday PM	13.9 s/v	B	16.1 s/v	C	16.6 s/v	C	0.5 s/v	No	--	--
31. Lemon Street at Parking Structure	D	Weekday PM	16.4 s/v	C	22.2 s/v	C	22.9 s/v	C	0.7 s/v	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-6**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Sat. Arrival Sat. Departure	35.5 s/v 35.0 s/v	D C	42.5 s/v 37.8 s/v	D D	42.9 s/v 37.9 s/v	D D	0.4 s/v 0.1 s/v	No No	-- --	-- --
2. Harbor Boulevard at Valley View Drive/ Brea Boulevard	D	Sat. Arrival Sat. Departure	26.7 s/v 26.8 s/v	C C	26.9 s/v 26.5 s/v	C C	26.9 s/v 26.7 s/v	C C	0.0 s/v 0.2 s/v	No No	-- --	-- --
3. Harbor Boulevard at Berkeley Avenue	D	Sat. Arrival Sat. Departure	19.7 s/v 16.5 s/v	B B	21.0 s/v 16.6 s/v	C B	22.9 s/v 19.9 s/v	C B	1.9 s/v 3.3 s/v	No No	-- --	-- --
4. Lemon Street at Berkeley Avenue	D	Sat. Arrival Sat. Departure	34.8 s/v 33.9 s/v	C C	35.2 s/v 33.9 s/v	D C	38.3 s/v <b>72.9 s/v</b>	D <b>E</b>	3.1 s/v <b>39.0 s/v</b>	No <b>Yes</b>	-- 19.7 s/v	-- B
5. Hornet Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	11.5 s/v 14.0 s/v	B B	11.2 s/v 13.4 s/v	B B	9.6 s/v 9.4 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
6. Euclid Street at Malvern Avenue	D	Sat. Arrival Sat. Departure	11.0 s/v 10.9 s/v	B B	19.6 s/v 19.6 s/v	B B	21.6 s/v 23.3 s/v	C C	2.0 s/v 3.7 s/v	No No	-- --	-- --
7. Harbor Boulevard at Chapman Avenue	E	Sat. Arrival Sat. Departure	26.5 s/v 26.5 s/v	C C	34.0 s/v 34.9 s/v	C C	46.2 s/v 46.3 s/v	D D	12.2 s/v 11.4 s/v	No No	-- --	-- --
8. Lemon Street at Chapman Avenue	D	Sat. Arrival Sat. Departure	33.1 s/v 32.9 s/v	C C	35.0 s/v 34.8 s/v	D C	37.1 s/v 37.3 s/v	D D	2.1 s/v 2.5 s/v	No No	-- --	-- --
9. Berkeley Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	10.0 s/v 9.5 s/v	A A	10.3 s/v 9.9 s/v	B A	14.2 s/v 23.5 s/v	B C	3.9 s/v 13.6 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-6 (CONTINUED)**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
10. Raymond Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	19.5 s/v 18.5 s/v	B B	21.0 s/v 19.7 s/v	C B	23.3 s/v 22.8 s/v	C C	2.3 s/v 3.1 s/v	No No	-- --	-- --
11. Acacia Avenue at Chapman Avenue	D	Sat. Arrival Sat. Departure	8.7 s/v 10.7 s/v	A B	9.3 s/v 10.6 s/v	A B	9.9 s/v 10.9 s/v	A B	0.6 s/v 0.3 s/v	No No	-- --	-- --
12. State College Boulevard at Chapman Avenue	D	Sat. Arrival Sat. Departure	37.1 s/v 36.9 s/v	D D	50.8 s/v 47.9 s/v	D D	<b>66.4 s/v</b> <b>89.4 s/v</b>	<b>E</b> <b>F</b>	<b>15.6 s/v</b> <b>41.5 s/v</b>	<b>Yes</b> <b>Yes</b>	52.9 s/v 52.8 s/v	D D
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	17.6 s/v 18.4 s/v	B B	24.1 s/v 24.7 s/v	C C	33.9 s/v 34.6 s/v	C C	9.8 s/v 9.9 s/v	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	25.2 s/v 26.7 s/v	C C	32.9 s/v 33.7 s/v	C C	44.7 s/v 47.7 s/v	D D	11.8 s/v 14.0 s/v	No No	-- --	-- --
15. Lemon Street at Wilshire Avenue	D	Sat. Arrival Sat. Departure	6.5 s/v 5.0 s/v	A A	6.0 s/v 4.7 s/v	A A	5.5 s/v 4.4 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
16. Harbor Boulevard at Commonwealth Avenue	E	Sat. Arrival Sat. Departure	30.8 s/v 30.4 s/v	C C	35.0 s/v 35.0 s/v	C C	36.5 s/v 42.0 s/v	D D	1.5 s/v 7.0 s/v	No No	-- --	-- --
17. Lemon Street at Commonwealth Avenue	D	Sat. Arrival Sat. Departure	32.4 s/v 32.4 s/v	C C	33.7 s/v 32.7 s/v	C C	34.7 s/v 34.0 s/v	C C	1.0 s/v 1.3 s/v	No No	-- --	-- --
18. Harbor Boulevard at Valencia Drive	D	Sat. Arrival Sat. Departure	11.5 s/v 11.6 s/v	B B	28.5 s/v 29.2 s/v	C C	28.5 s/v 29.4 s/v	C C	0.0 s/v 0.2 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-6 (CONTINUED)**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
19. Lemon Street at Valencia Drive	D	Sat. Arrival Sat. Departure	10.5 s/v 11.0 s/v	B B	12.2 s/v 12.4 s/v	B B	12.0 s/v 12.4 s/v	B B	0.0 s/v 0.0 s/v	No No	-- --	-- --
20. Harbor Boulevard at Orangethorpe Avenue	E	Sat. Arrival Sat. Departure	39.2 s/v 38.0 s/v	D D	<b>92.1 s/v</b> <b>81.7 s/v</b>	<b>F</b> <b>F</b>	<b>104.9 s/v</b> <b>91.7 s/v</b>	<b>F</b> <b>F</b>	12.8 s/v 10.0 s/v	No No	-- --	-- --
21. Lemon Street at Orangethorpe Avenue	D	Sat. Arrival Sat. Departure	34.1 s/v 32.9 s/v	C C	44.3 s/v 38.3 s/v	D D	49.7 s/v 48.3 s/v	D D	5.4 s/v 10.0 s/v	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	17.3 s/v 20.1 s/v	B C	28.0 s/v 37.1 s/v	C D	28.8 s/v 41.3 s/v	C D	0.8 s/v 4.2 s/v	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	27.7 s/v 24.8 s/v	C C	48.1 s/v 36.0 s/v	D D	54.7 s/v 44.0 s/v	D D	6.6 s/v 8.0 s/v	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	23.6 s/v 22.4 s/v	C C	27.4 s/v 25.8 s/v	C C	28.4 s/v 25.8 s/v	C C	1.0 s/v 0.0 s/v	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	27.8 s/v 27.8 s/v	C C	32.6 s/v 32.0 s/v	C C	34.8 s/v 32.8 s/v	C C	2.2 s/v 0.8 s/v	No No	-- --	-- --
26. Centennial Way at Berkeley Avenue	D	Sat. Arrival Sat. Departure	10.2 s/v 9.7 s/v	B A	10.5 s/v 9.9 s/v	B A	11.0 s/v 12.1 s/v	B B	0.5 s/v 2.2 s/v	No No	-- --	-- --
27. Lemon Street at Fullerton College Drive	D	Sat. Arrival Sat. Departure	14.4 s/v 4.9 s/v	B A	14.0 s/v 5.9 s/v	B A	14.9 s/v 19.4 s/v	B C	0.9 s/v 13.5 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 8-6 (CONTINUED)**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2030 Buildout Traffic Conditions		(3)  Year 2030 Buildout Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
28. Berkeley Avenue at College Driveway No. 1	D	Sat. Arrival Sat. Departure	11.2 s/v 10.4 s/v	B B	12.5 s/v 11.3 s/v	B B	<b>124.2 s/v</b> <b>114.1 s/v</b>	F F	111.7 s/v <b>102.8 s/v</b>	Yes Yes	6.1 s/v 15.9 s/v	A B
29. Berkeley Avenue at College Driveway No. 2	D	Sat. Arrival Sat. Departure	10.7 s/v 9.8 s/v	B A	11.2 s/v 10.1 s/v	B B	14.3 s/v <b>113.6 s/v</b>	B F	3.1 s/v <b>103.5 s/v</b>	No Yes	-- 14.5 s/v	-- B
30. Berkeley Avenue at Brookdale Place	D	Sat. Arrival Sat. Departure	11.7 s/v 9.9 s/v	B A	12.5 s/v 10.3 s/v	B B	24.7 s/v 14.5 s/v	C B	12.2 s/v 4.2 s/v	No No	-- --	-- --
31. Lemon Street at Parking Structure	D	Sat. Arrival Sat. Departure	10.1 s/v 9.5 s/v	B A	10.6 s/v 9.9 s/v	B A	13.0 s/v 10.7 s/v	B B	2.4 s/v 0.8 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle



## 9.0 STATE OF CALIFORNIA (CALTRANS) METHODOLOGY

In conformance with the current Caltrans *Guide for the Preparation of Traffic Impact Studies*, existing and projected weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour operating conditions at the six (6) state-controlled study intersections within the study area have been evaluated using the *Highway Capacity Manual* operations method of analysis. These state-controlled locations include the following six of thirty-one key study intersections:

- |  |  |
|--|--|
| 13. SR-57 SB Ramps at Chapman Avenue   | 23. Lemon Street at SR-91 WB Ramps     |
| 14. SR-57 NB Ramps at Chapman Avenue   | 24. Harbor Boulevard at SR-91 EB Ramps |
| 22. Harbor Boulevard at SR-91 WB Ramps | 25. Lemon Street at SR-91 EB Ramps     |

Caltrans “endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities”; it does not require that LOS “D” (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Based on historic coordination with Caltrans, for this analysis, LOS D is the target level of service standard and will be utilized to assess the project impacts at the state-controlled study intersections.

### 9.1 Existing Plus Project Traffic Conditions – Weekday Academic Instruction

*Table 9-1* summarizes the weekday PM peak hour HCM level of service results at the six (6) state-controlled study intersections within the study area for Existing plus Project (i.e. academic instruction) traffic conditions. The first column (1) of HCM/LOS values in *Table 9-1* presents a summary of existing traffic conditions. The second column (2) presents Existing plus Project (i.e. academic instruction) traffic conditions based on existing intersection geometry. The third column (3) indicates whether added peak hour Project trips will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated level of service with planned and/or recommended improvements.

#### 9.1.1 Existing Traffic Conditions – Weekday Academic Instruction

Review of Column 1 of *Table 9-1* indicates that all six (6) state-controlled study intersections currently operate at an acceptable LOS during the weekday PM peak hour.

#### 9.1.2 Existing Plus Project Traffic Conditions – Weekday Academic Instruction

Review of Columns 2 and 3 of *Table 9-1* indicates that traffic associated with the proposed Project (i.e. academic instruction) **will not** significantly impact any of the six (6) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the weekday PM peak hour with the addition of project traffic to existing traffic.

*Appendix H* presents the Existing plus Project HCM/LOS weekday PM peak hour calculations for the six (6) state-controlled study intersections.

## 9.2 Existing Plus Project Traffic Conditions – Saturday Field Event

*Table 9-2* summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour Level of Service results at the six (6) state-controlled study intersections within the study area for Existing plus Project (i.e. field event) traffic conditions. The first column (1) of HCM/LOS values in *Table 9-2* presents a summary of existing traffic conditions. The second column (2) presents Existing plus Project (i.e. field event) traffic conditions based on existing intersection geometry. The third column (3) indicates whether added peak hour Project trips will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated level of service with planned and/or recommended improvements.

### 9.2.1 Existing Traffic Conditions – Saturday Field Event

Review of Column 1 of *Table 9-2* indicates that all six (6) state-controlled study intersections currently operate at an acceptable LOS during the Saturday Event Arrival and Event Departure peak hours.

### 9.2.2 Existing Plus Project Traffic Conditions – Saturday Field Event

Review of Columns 2 and 3 of *Table 9-2* indicates that traffic associated with the proposed Project (i.e. field event) ***will not*** significantly impact any of the six (6) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the Saturday Event Arrival and Event Departure peak hours with the addition of project traffic to existing traffic.

*Appendix H* also presents the Existing plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the six (6) state-controlled intersections.

## 9.3 Year 2020 Traffic Conditions – Weekday Academic Instruction

*Table 9-3* summarizes the weekday PM peak hour HCM level of service results at the six (6) state-controlled study intersections within the study area for Year 2020 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-3* presents Year 2020 traffic conditions (existing plus ambient growth plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The second column (2) presents forecast Year 2020 traffic conditions with the addition of Project traffic. The third column (3) indicates whether added peak hour Project trips will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated level of service with planned and/or recommended improvements.

### 9.3.1 Year 2020 Traffic Conditions (Without Project) – Weekday Academic Instruction

An analysis of future (Year 2020) traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will not adversely impact the six (6) state-controlled study intersections. The six (6) state-controlled study intersections are forecast to operate at acceptable

LOS C or better during the weekday PM peak hour with the addition of ambient traffic growth and cumulative projects traffic in the Year 2020.

### **9.3.2 Year 2020 Plus Project Traffic Conditions – Weekday Academic Instruction**

Review of Columns 2 and 3 of *Table 9-3* indicates that traffic associated with the proposed Project (i.e. academic instruction) ***will not*** significantly impact any of the six (6) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the weekday PM peak hour with the addition of Project generated traffic under Year 2020 traffic conditions.

*Appendix I* presents the Year 2020 plus Project HCM/LOS weekday PM peak hour calculations for the six (6) state-controlled study intersections.

### **9.4 Year 2020 Traffic Conditions – Saturday Field Event**

*Table 9-4* summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour HCM level of service results at the six (6) state-controlled study intersections within the study area for Year 2020 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-4* presents Year 2020 traffic conditions (existing plus ambient growth plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The second column (2) presents forecast Year 2020 traffic conditions with the addition of Project traffic. The third column (3) indicates whether added peak hour Project trips will have a significant impact based on the significant impact criteria defined in this report. The fourth column (4) indicates the anticipated level of service with planned and/or recommended improvements.

#### **9.4.1 Year 2020 Traffic Conditions (Without Project) – Saturday Field Event**

An analysis of future (Year 2020) traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will not adversely impact the six (6) state-controlled study intersections. The six (6) state-controlled study intersections are forecast to operate at acceptable LOS C or better during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of ambient traffic growth and cumulative projects traffic in the Year 2020.

#### **9.4.2 Year 2020 Plus Project Traffic Conditions – Saturday Field Event**

Review of Columns 2 and 3 of *Table 9-4* indicates that traffic associated with the proposed Project (i.e. field event) ***will not*** significantly impact any of the six (6) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of Project generated traffic under Year 2020 traffic conditions.

*Appendix I* also presents the Year 2020 plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the six (6) state-controlled study intersections.

## **9.5 Year 2030 Traffic Conditions – Weekday Academic Instruction**

*Table 9-5* summarizes the weekday PM peak hour HCM level of service results at the six (6) state-controlled study intersections within the study area for the Year 2030 buildout year and is similar in setup to *Table 9-3*.

### **9.5.1 Year 2030 Buildout Traffic Conditions (Without Project) – Weekday Academic Instruction**

An analysis of future (Year 2030) buildout traffic conditions indicates that the addition of ambient traffic growth and cumulative projects traffic will adversely impact one (1) of the six (6) state-controlled study intersections. The state-controlled study intersection of the SR-57 NB Ramps/Chapman Avenue is forecast to operate at unacceptable LOS F during the weekday PM peak hour. The remaining five state-controlled study intersections are forecast to operate at acceptable LOS D or better during the weekday PM peak hour with the addition of ambient traffic growth and cumulative projects traffic in the Year 2030.

### **9.5.2 Year 2030 Buildout Plus Project Traffic Conditions – Weekday Academic Instruction**

Review of Columns 2 and 3 of *Table 9-5* indicates that traffic associated with the proposed Project (i.e. academic instruction) will cumulatively impact one of the six (6) state-controlled study intersections, when compared to the LOS standards specified in this report. The remaining five state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better with the addition of project generated traffic in the Year 2030.

As shown in Column 4 of *Table 9-5*, the implementation of improvements at the impacted state-controlled intersection of the SR-57 NB Ramps/Chapman Avenue completely offsets the impact of the proposed project. The impacted state-controlled key study intersection of the SR-57 NB Ramps/Chapman Avenue is forecast to operate at an acceptable LOS during the weekday PM peak hour with implementation of improvements.

*Appendix J* presents the Year 2030 Buildout plus Project HCM/LOS weekday PM peak hour calculations for the six (6) state-controlled study intersections.

## **9.6 Year 2030 Traffic Conditions – Saturday Field Event**

*Table 9-6* summarizes the Saturday Event Arrival peak hour and Saturday Event Departure peak hour HCM level of service results at the six (6) state-controlled study intersections within the study area for the Year 2030 buildout year and is similar in setup to *Table 9-4*.

### **9.6.1 Year 2030 Buildout Traffic Conditions (Without Project) – Saturday Field Event**

An analysis of future (Year 2030) buildout traffic conditions indicates that the addition of ambient growth and cumulative projects traffic will not adversely impact the six (6) state-controlled study intersections. The six (6) state-controlled study intersections are forecast to operate at acceptable LOS D or better during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of ambient traffic growth and cumulative projects traffic in the Year 2030.

### **9.6.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event**

Review of Columns 2 and 3 of *Table 9-6* indicates that traffic associated with the proposed Project (i.e. field event) **will not** significantly impact any of the six (6) state-controlled study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of Project generated traffic under Year 2030 traffic conditions.

*Appendix J* also presents the Year 2030 Buildout plus Project HCM/LOS Saturday Event Arrival peak hour and Saturday Event Departure peak hour calculations for the six (6) state-controlled study intersections.

**TABLE 9-1**  
**EXISTING PLUS PROJECT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – ACADEMIC INSTRUCTION**

Key Intersections	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Impact	(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	18.2 s/v	B	18.3 s/v	B	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	26.5 s/v	C	26.5 s/v	C	No	--	--
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	17.2 s/v	B	17.2 s/v	B	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	24.5 s/v	C	24.6 s/v	C	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	19.6 s/v	B	19.7 s/v	B	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	23.0 s/v	C	23.1 s/v	C	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 9-2**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – FIELD EVENT**

Key Intersections	Min. Acc. LOS	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Impact	(4) Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	17.6 s/v 18.4 s/v	B B	20.2 s/v 19.3 s/v	C B	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	25.2 s/v 26.7 s/v	C C	28.0 s/v 29.4 s/v	C C	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	17.3 s/v 20.1 s/v	B C	17.4 s/v 21.1 s/v	B C	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	27.7 s/v 24.8 s/v	C C	29.5 s/v 26.2 s/v	C C	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	23.6 s/v 22.4 s/v	C C	24.4 s/v 22.5 s/v	C C	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	27.8 s/v 27.8 s/v	C C	29.1 s/v 28.2 s/v	C C	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 9-3**  
**YEAR 2020 WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – ACADEMIC INSTRUCTION**

Key Intersections	Min. Acc. LOS	Time Period	(1) Year 2020 Cumulative Traffic Conditions		(2) Year 2020 Cumulative Plus Project Traffic Conditions		(3) Impact	(4) Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	18.5 s/v	B	18.5 s/v	B	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	27.0 s/v	C	27.1 s/v	C	No	--	--
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	17.7 s/v	B	17.7 s/v	B	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	25.0 s/v	C	25.0 s/v	C	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	19.9 s/v	B	20.0 s/v	C	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	23.3 s/v	C	23.3 s/v	C	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle



**TABLE 9-4**  
**YEAR 2020 SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – FIELD EVENT**

Key Intersections	Min. Acc. LOS	Time Period	(1) Year 2020 Cumulative Traffic Conditions		(2) Year 2020 Cumulative Plus Project Traffic Conditions		(3) Impact	(4) Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	17.7 s/v 18.5 s/v	B B	20.3 s/v 19.6 s/v	C B	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	25.4 s/v 26.8 s/v	C C	28.2 s/v 29.6 s/v	C C	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	17.8 s/v 20.7 s/v	B C	17.8 s/v 21.9 s/v	B C	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	28.9 s/v 25.1 s/v	C C	31.0 s/v 26.7 s/v	C C	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	23.8 s/v 22.5 s/v	C C	24.6 s/v 22.5 s/v	C C	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	28.1 s/v 28.0 s/v	C C	29.4 s/v 28.5 s/v	C C	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 9-5**  
**YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – ACADEMIC INSTRUCTION**

Key Intersections	Min. Acc. LOS	Time Period	(1) Year 2030 Buildout Traffic Conditions		(2) Year 2030 Buildout Plus Project Traffic Conditions		(3) Impact	(4) Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Weekday PM	30.9 s/v	C	31.1 s/v	C	No	--	--
14. SR-57 NB Ramps at Chapman Avenue	D	Weekday PM	<b>86.2 s/v</b>	<b>F</b>	<b>87.0 s/v</b>	<b>F</b>	<b>Yes</b>	37.7 s/v	D
22. Harbor Boulevard at SR-91 WB Ramps	D	Weekday PM	30.4 s/v	C	30.4 s/v	C	No	--	--
23. Lemon Street at SR-91 WB Ramps	D	Weekday PM	40.9 s/v	D	41.1 s/v	D	No	--	--
24. Harbor Boulevard at SR-91 EB Ramps	D	Weekday PM	25.6 s/v	C	25.7 s/v	C	No	--	--
25. Lemon Street at SR-91 EB Ramps	D	Weekday PM	29.1 s/v	C	29.2 s/v	C	No	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 9-6**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS (CALTRANS) – FIELD EVENT**

Key Intersections	Min. Acc. LOS	Time Period	(1) Year 2030 Buildout Traffic Conditions		(2) Year 2030 Buildout Plus Project Traffic Conditions		(3) Impact	(4) Year 2030 Buildout Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Yes/No	HCM	LOS
13. SR-57 SB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	24.1 s/v 24.7 s/v	C C	33.9 s/v 34.6 s/v	C C	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Sat. Arrival Sat. Departure	32.9 s/v 33.7 s/v	C C	44.7 s/v 47.7 s/v	D D	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	28.0 s/v 37.1 s/v	C D	28.8 s/v 41.3 s/v	C D	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Sat. Arrival Sat. Departure	48.1 s/v 36.0 s/v	D D	54.7 s/v 44.0 s/v	D D	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	27.4 s/v 25.8 s/v	C C	28.4 s/v 25.8 s/v	C C	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Sat. Arrival Sat. Departure	32.6 s/v 32.0 s/v	C C	34.8 s/v 32.8 s/v	C C	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

## 9.7 Off-Ramp Queuing Analysis

A queuing evaluation has been conducted for the aforementioned six (6) state-controlled study intersections (i.e. SR-57 Freeway Off-Ramps at Chapman Avenue and the SR-91 Freeway Off-Ramps at Harbor Boulevard and Lemon Street) to determine the minimum required stacking/storage lengths for all off-ramp lanes. The queuing evaluation was conducted based on projected Existing plus Project, Year 2020 Cumulative plus Project, and Year 2030 Buildout plus Project peak hour traffic volumes and was prepared for the weekday PM peak hour and Saturday Event Arrival and Event Departure peak hours.

Given that Caltrans does not have significant impact criteria for off-ramp queuing, based on historic coordination with Caltrans, the queue with the proposed Project should not impede the freeway mainline.

### 9.7.1 Existing Plus Project Traffic Conditions

**Table 9-7** presents the weekday PM peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Existing plus Project traffic conditions. **Table 9-8** presents the Saturday Event Arrival peak hour and Saturday Event Departure peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Existing plus Project traffic conditions.

Review of *Tables 9-7* and *9-8* indicates that adequate storage is provided at the off-ramps for all six (6) state-controlled study intersections under Existing plus Project traffic conditions during the weekday PM peak hour, Saturday Event Arrival peak hour, and Saturday Event Departure peak hour.

*Appendix H* presents the weekday and Saturday LOS/queuing calculations for Existing plus Project traffic conditions.

### 9.7.2 Year 2020 Cumulative Plus Project Traffic Conditions

**Table 9-9** presents the weekday PM peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Year 2020 Cumulative plus Project traffic conditions. **Table 9-10** presents the Saturday Event Arrival peak hour and Saturday Event Departure peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Year 2020 Cumulative plus Project traffic conditions.

Review of *Tables 9-9* and *9-10* indicates that adequate storage is provided at the off-ramps for all six (6) state-controlled study intersections under Year 2020 Cumulative plus Project traffic conditions during the weekday PM peak hour, Saturday Event Arrival peak hour, and Saturday Event Departure peak hour.

*Appendix I* presents the weekday and Saturday LOS/queuing calculations for Year 2020 Cumulative plus Project traffic conditions.

### 9.7.3 Year 2030 Buildout Plus Project Traffic Conditions

**Table 9-11** presents the weekday PM peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Year 2030 Buildout plus Project traffic conditions. **Table 9-12** presents the Saturday Event Arrival peak hour and Saturday Event Departure peak hour 95<sup>th</sup> percentile queuing analysis results for the aforementioned six (6) state-controlled study intersections under Year 2030 Buildout plus Project traffic conditions.

Review of *Tables 9-11* and *9-12* indicates that adequate storage is provided at the off-ramps for all six (6) state-controlled study intersections under Year 2030 Buildout plus Project traffic conditions during the weekday PM peak hour, Saturday Event Arrival peak hour, and Saturday Event Departure peak hour.

*Appendix J* presents the weekday and Saturday LOS/queuing calculations for Year 2030 Buildout plus Project traffic conditions.

TABLE 9-7

EXISTING PLUS PROJECT WEEKDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – ACADEMIC INSTRUCTION<sup>7</sup>

Key Ramp Intersection	(1) Existing Plus Project Traffic Conditions		
	Estimated Storage Provided (feet)	Weekday PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	327' 226'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	380' 380' 380'	Yes Yes Yes
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	285' 176' 342'	Yes Yes Yes <sup>8</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	279' 270' 539'	Yes Yes Yes <sup>9</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	322' 262' 133'	Yes <sup>10</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	351' 342' 50'	Yes Yes Yes

<sup>7</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>8</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>9</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,210' is greater than those combined queues.

<sup>10</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.

TABLE 9-8

EXISTING PLUS PROJECT SATURDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – FIELD EVENT<sup>11</sup>

Key Ramp Intersection	(1) Existing Plus Project Traffic Conditions				
	Estimated Storage Provided (feet)	Sat. Arrival Peak Hour		Sat. Departure Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	118' 156'	Yes Yes	130' 159'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	311' 301' 290'	Yes Yes Yes	325' 318' 311'	Yes Yes Yes
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	204' 161' 338'	Yes Yes Yes <sup>12</sup>	190' 152' 412'	Yes Yes Yes <sup>12</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	222' 215' 619'	Yes Yes Yes <sup>13</sup>	248' 240' 559'	Yes Yes Yes <sup>13</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	362' 180' 158'	Yes <sup>14</sup> Yes Yes	315' 213' 134'	Yes <sup>14</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	428' 400' 49'	Yes Yes Yes	426' 401' 45'	Yes Yes Yes

<sup>11</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>12</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>13</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,210' is greater than those combined queues.

<sup>14</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.

**TABLE 9-9**  
**YEAR 2020 CUMULATIVE WEEKDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – ACADEMIC**  
**INSTRUCTION<sup>15</sup>**

Key Ramp Intersection	(1) Year 2020 Cumulative Plus Project Traffic Conditions		
	Estimated Storage Provided (feet)	Weekday PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	332' 236'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	385' 385' 385'	Yes Yes Yes
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	285' 177' 354'	Yes Yes Yes <sup>16</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	285' 275' 550'	Yes Yes Yes <sup>17</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	331' 269' 133'	Yes <sup>18</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	359' 350' 50'	Yes Yes Yes

<sup>15</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>16</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>17</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,210' is greater than those combined queues.

<sup>18</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.



**TABLE 9-10**  
**YEAR 2020 CUMULATIVE SATURDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – FIELD EVENT<sup>19</sup>**

Key Ramp Intersection	(1) Year 2020 Cumulative Plus Project Traffic Conditions				
	Estimated Storage Provided (feet)	Sat. Arrival Peak Hour		Sat. Departure Peak Hour	
		Max. Queue/Min. Storage Required	Adequate Storage (Yes / No)	Max. Queue/Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	105' 288'	Yes Yes	131' 186'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	357' 357' 357'	Yes Yes Yes	333' 329' 323'	Yes Yes Yes
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	205' 177' 348'	Yes Yes Yes <sup>20</sup>	189' 211' 420'	Yes Yes Yes <sup>20</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	215' 207' 663'	Yes Yes Yes <sup>21</sup>	251' 243' 571'	Yes Yes Yes <sup>21</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	392' 265' 153'	Yes <sup>22</sup> Yes Yes	324' 225' 135'	Yes <sup>22</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	482' 449' 47'	Yes Yes Yes	445' 414' 46'	Yes Yes Yes

<sup>19</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>20</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>21</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,210' is greater than those combined queues.

<sup>22</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.

TABLE 9-11

YEAR 2030 BUILDOUT WEEKDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – ACADEMIC INSTRUCTION<sup>23</sup>

Key Ramp Intersection	(1) Year 2030 Buildout Plus Project Traffic Conditions		
	Estimated Storage Provided (feet)	Weekday PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	391' 489'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	792' 792' 792'	Yes Yes Yes <sup>24</sup>
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	280' 194' 596'	Yes Yes Yes <sup>25</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	330' 310' 920'	Yes Yes Yes <sup>26</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	425' 293' 126'	Yes <sup>27</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	458' 436' 49'	Yes Yes Yes

<sup>23</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>24</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the NB shared left/right lane since the combined storage between the NB right-turn lane and NB shared left/right lane of 1,835' is greater than those combined queues (420' of the 1,835' is contained within the portion of the auxiliary lane marked by a solid white line).

<sup>25</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>26</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,690' is greater than those combined queues (480' of the 1,690' is contained within the portion of the auxiliary lane marked by a solid white line).

<sup>27</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.

**TABLE 9-12**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS – FIELD EVENT<sup>28</sup>**

Key Ramp Intersection	(1) Year 2030 Buildout Plus Project Traffic Conditions				
	Estimated Storage Provided (feet)	Sat. Arrival Peak Hour		Sat. Departure Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes / No)
13. SR-57 SB Ramps at Chapman Avenue <i>Southbound Shared Through/Left-Turn</i> <i>Southbound Right-Turn</i>	1,050' 1,295'	139' 459'	Yes Yes	169' 366'	Yes Yes
14. SR-57 NB Ramps at Chapman Avenue <i>Northbound Left-Turn</i> <i>Northbound Shared Left/Right-Turn</i> <i>Northbound Right-Turn</i>	915' 915' 500'	487' 487' 487'	Yes Yes Yes	478' 478' 478'	Yes Yes Yes
22. Harbor Boulevard at SR-91 WB Ramps <i>Westbound Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	360' 1,210' 265'	206' 194' 562'	Yes Yes Yes <sup>29</sup>	199' 231' 814'	Yes Yes Yes <sup>29</sup>
23. Lemon Street at SR-91 WB Ramps <i>Westbound Shared Through/Left-Turn</i> <i>Westbound Through</i> <i>Westbound Right-Turn</i>	890' 890' 320'	257' 244' 1,187'	Yes Yes Yes <sup>30</sup>	283' 270' 895'	Yes Yes Yes <sup>31</sup>
24. Harbor Boulevard at SR-91 EB Ramps <i>Eastbound Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	245' 1,175' 245'	474' 277' 150'	Yes <sup>32</sup> Yes Yes	403' 246' 133'	Yes <sup>32</sup> Yes Yes
25. Lemon Street at SR-91 EB Ramps <i>Eastbound Shared Through/Left-Turn</i> <i>Eastbound Through</i> <i>Eastbound Right-Turn</i>	1,250' 1,250' 1,250'	601' 538' 46'	Yes Yes Yes	558' 502' 45'	Yes Yes Yes

<sup>28</sup> Queue is based on the 95<sup>th</sup> Percentile Queue and is reported in total queue length (feet) per lane for signalized intersections.

<sup>29</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the No. 2 WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,475' is greater than those combined queues.

<sup>30</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,690' is greater than those combined queues (480' of the 1,690' is contained within the portion of the auxiliary lane marked by a solid white line).

<sup>31</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the WB through lane since the combined storage between the WB right-turn lane and WB through lane of 1,210' is greater than those combined queues.

<sup>32</sup> Although the queue exceeds the specific lane movement storage, the excess queue can be accommodated within the EB through lane since the combined storage between the EB left-turn lane and EB through lane of 1,420' is greater than those combined queues.

## 10.0 CALTRANS FACILITIES ANALYSIS

Caltrans requires the use of analysis methods provided in the Highway Capacity Manual 6 (*HCM 6*) for the analysis of ramp intersections. As discussed previously in Section 9.0, Caltrans “endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities”; it does not require that LOS “D” (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Based on historic coordination with Caltrans, for this analysis, LOS D is the target level of service standard and will be utilized to assess the project impacts at the state-controlled study locations.

A Basic Freeway Segment Analysis for freeway mainlines was conducted for the following eight (8) Caltrans freeway segments. The eight (8) freeway segments were selected for evaluation based on application of Caltrans criteria and the resultant peak hour level of service results for existing conditions.

1. SR-57 Northbound *south of* Chapman Avenue
2. SR-57 Northbound *north of* Nutwood Avenue
3. SR-57 Southbound *north of* Nutwood Avenue
4. SR-57 Southbound *south of* Chapman Avenue
5. SR-91 Westbound *east of* Lemon Street
6. SR-91 Westbound *west of* Harbor Boulevard
7. SR-91 Eastbound *west of* Harbor Boulevard
8. SR-91 Eastbound *east of* Lemon Street

Additionally, a Freeway Merge and Diverge Segment Analysis for ramp junctions was conducted for the following eight (8) Caltrans freeway merge and diverge segments. The eight (8) freeway merge and diverge segments were selected for evaluation based on application of Caltrans criteria and the resultant peak hour level of service results for existing conditions.

1. SR-57 Northbound Off-Ramp *to* Chapman Avenue
2. SR-57 Northbound On-Ramp *from* Nutwood Avenue
3. SR-57 Southbound Off-Ramp *to* Nutwood Avenue
4. SR-57 Southbound On-Ramp *from* Chapman Avenue
5. SR-91 Westbound Off-Ramp *to* Lemon Street
6. SR-91 Westbound On-Ramp *from* Harbor Boulevard
7. SR-91 Eastbound Off-Ramp *to* Harbor Boulevard
8. SR-91 Eastbound On-Ramp *from* Lemon Street

## 10.1 Basic Freeway Segment Capacity Analysis

### 10.1.1 Existing Traffic Conditions

**Table 10-1** summarizes the peak hour Level of Service results at the eight (8) basic freeway segments located along the SR-57 and SR-91 Freeways for Existing traffic conditions under Weekday PM peak hour traffic conditions. **Table 10-2** summarizes the peak hour Level of Service results at the eight (8) basic freeway segments located along the SR-57 and SR-91 Freeways for the Existing traffic conditions under Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions. Review of *Tables 10-1* and *10-2* indicates that the eight key freeway segments currently operate at LOS D or better during the Weekday PM peak hour and during the Saturday Arrival and Departure peak hours.

Per Caltrans guidelines, the following is stated in the *Caltrans Guide for the Preparation of Traffic Impact Studies, December 2002*:

*“The following criterion is a starting point in determining when a TIS is needed. When a project:*

- 1. Generates over 100 peak hour trips assigned to a State highway facility.....*
- 2. Generates 50 to 100 peak hour trips assigned to a State highway facility and noticeable delay approaching LOS C or D.....*
- 3. Generates 1 to 49 peak hour trips assigned to a State highway facility and noticeable delay approaching LOS E or F.....”*

Based on the Caltrans criteria above and the results of the basic freeway segment analysis for Existing Weekday PM peak hour traffic conditions as presented in *Table 10-1*, it is determined that no additional analysis is needed for the eight (8) key freeway segments located along the SR-57 and SR-91 Freeways since the proposed Project (academic instruction) does not generate 50 to 100 peak hour trips assigned to a state highway facility and the eight (8) freeway segments are forecast to operate at an acceptable LOS D or better during the Weekday PM peak hour under Existing traffic conditions. It should be noted that a merge/diverge analysis is also not required for the Weekday PM peak hour (academic instruction) since the Caltrans criteria required for further analysis is not satisfied.

Based on the Caltrans criteria above and the results of the basic freeway segment analysis for Existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions as presented in *Table 10-2*, it is determined that no additional analysis is needed for key freeway segment #5 located along the SR-91 Freeway since the proposed Project (field event) does not generate 50 to 100 peak hour trips assigned to the state highway facility and the freeway segment is forecast to operate at an acceptable LOS C during the Saturday Event Arrival peak hour and during the Saturday Event Departure peak hour under Existing traffic conditions. Further review of *Table 10-2* indicates that additional traffic analysis will be required for the remaining seven (7) key freeway segments located along the SR-57 and SR-91 Freeways since the Project generates more

than 50 peak hour trips assigned to a state highway facility during the Saturday Event Arrival peak hour or during the Saturday Event Departure peak hour.

*Appendix K* contains the Basic Freeway Segment Analysis calculation worksheets for the eight (8) freeway segments for Existing weekday and Saturday traffic conditions.

## **10.2 Existing Plus Project Traffic Conditions – Saturday Field Event**

*Table 10-3* summarizes the peak hour level of service results at the seven (7) key freeway segments located along the SR-57 and SR-91 Freeways for Existing plus Project traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour. The first column (1) presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions. The second column (2) presents Existing plus Project Saturday traffic conditions and the third column (3) indicates whether the traffic associated with the proposed project will have an impact based on the LOS standards defined in this report.

Review of *Table 10-3* indicates that with the addition of Project traffic, one (1) of the seven (7) evaluated freeway segments is forecast to operate at an unacceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour when compared to the LOS standards defined in this report (i.e. key freeway segment #4; SR-57 Freeway). The Project's contribution to the freeway system can be considered significantly impacted at this one (1) freeway mainline location under this traffic scenario. The remaining six (6) freeway segments located along the SR-57 and SR-91 Freeways are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under existing plus project traffic conditions.

*Appendix K* contains the Basic Freeway Segment Analysis calculation worksheets for the seven (7) freeway segments for Existing Plus Project Saturday traffic conditions.

**TABLE 10-1**  
**EXISTING WEEKDAY PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY – ACADEMIC INSTRUCTION**

Key Basic Freeway Segment	Time Period	Lanes	Total Project Trips	(1) Existing Traffic Conditions		
				Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS
1. SR-57 Northbound <i>south of</i> Chapman Avenue	Weekday PM	6	3	1,588	24.6	C
2. SR-57 Northbound <i>north of</i> Nutwood Avenue	Weekday PM	6	0	1,371	21.1	C
3. SR-57 Southbound <i>north of</i> Nutwood Avenue	Weekday PM	5	5	1,389	21.4	C
4. SR-57 Southbound <i>south of</i> Chapman Avenue	Weekday PM	4	0	1,932	31.7	D
5. SR-91 Westbound <i>east of</i> Lemon Street	Weekday PM	5	3	1,721	27.1	D
6. SR-91 Westbound <i>west of</i> Harbor Boulevard	Weekday PM	4	0	2,040	34.5	D
7. SR-91 Eastbound <i>west of</i> Harbor Boulevard	Weekday PM	4	7	1,896	30.8	D
8. SR-91 Eastbound <i>east of</i> Lemon Street	Weekday PM	5	0	1,490	23.0	C

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

**TABLE 10-2**  
**EXISTING SATURDAY PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY – FIELD EVENT**

Key Basic Freeway Segment	Time Period	Lanes	Total Project Trips	(1) Existing Traffic Conditions		
				Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS
1. SR-57 Northbound <i>south of</i> Chapman Avenue	Sat. Arrival Sat. Departure	6	184 21	1,408 1,448	21.7 22.3	C C
2. SR-57 Northbound <i>north of</i> Nutwood Avenue	Sat. Arrival Sat. Departure	6	33 153	1,312 1,352	20.2 20.8	C C
3. SR-57 Southbound <i>north of</i> Nutwood Avenue	Sat. Arrival Sat. Departure	5	123 14	1,489 1,474	22.9 22.7	C C
4. SR-57 Southbound <i>south of</i> Chapman Avenue	Sat. Arrival Sat. Departure	4	50 229	2,048 2,019	34.7 33.9	D D
5. SR-91 Westbound <i>east of</i> Lemon Street	Sat. Arrival Sat. Departure	5	49 6	1,659 1,617	25.9 25.1	C C
6. SR-91 Westbound <i>west of</i> Harbor Boulevard	Sat. Arrival Sat. Departure	4	50 230	2,008 1,950	33.6 32.1	D D
7. SR-91 Eastbound <i>west of</i> Harbor Boulevard	Sat. Arrival Sat. Departure	4	185 21	1,878 1,850	30.4 29.8	D D
8. SR-91 Eastbound <i>east of</i> Lemon Street	Sat. Arrival Sat. Departure	5	13 61	1,566 1,560	24.2 24.1	C C

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria



**TABLE 10-3**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY – FIELD EVENT**

Key Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Existing Plus Project Traffic Conditions			(3) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
1. SR-57 Northbound <i>south of</i> Chapman Avenue	Sat. Arrival	1,408	21.7	C	1,441	22.2	C	No
	Sat. Departure	1,448	22.3	C	1,451	22.3	C	No
2. SR-57 Northbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,312	20.2	C	1,318	20.3	C	No
	Sat. Departure	1,352	20.8	C	1,380	21.2	C	No
3. SR-57 Southbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,489	22.9	C	1,515	23.4	C	No
	Sat. Departure	1,474	22.7	C	1,477	22.8	C	No
4. SR-57 Southbound <i>south of</i> Chapman Avenue	Sat. Arrival	2,048	34.7	D	<b>2,061</b>	<b>35.1</b>	<b>E</b>	<b>Yes</b>
	Sat. Departure	2,019	33.9	D	<b>2,080</b>	<b>35.6</b>	<b>E</b>	<b>Yes</b>
6. SR-91 Westbound <i>west of</i> Harbor Boulevard	Sat. Arrival	2,008	33.6	D	2,022	34.0	D	No
	Sat. Departure	1,950	32.1	D	2,012	33.7	D	No
7. SR-91 Eastbound <i>west of</i> Harbor Boulevard	Sat. Arrival	1,878	30.4	D	1,928	31.6	D	No
	Sat. Departure	1,850	29.8	D	1,856	29.9	D	No
8. SR-91 Eastbound <i>east of</i> Lemon Street	Sat. Arrival	1,566	24.2	C	1,569	24.3	C	No
	Sat. Departure	1,560	24.1	C	1,573	24.3	C	No

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

### **10.3 Year 2020 Cumulative Plus Project Basic Freeway Segment Capacity Analysis – Saturday Field Event**

*Table 10-4* summarizes the peak hour level of service results at the seven (7) key freeway segments located along the SR-57 and SR-91 Freeways for Year 2020 Cumulative traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour. The first column (1) presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions. The second column (2) presents Year 2020 Cumulative Saturday traffic conditions and the third column (3) presents Year 2020 Cumulative plus Project Saturday traffic conditions. The fourth (4) column indicates whether the traffic associated with the proposed project will have an impact based on the LOS standards defined in this report.

#### **10.3.1 Year 2020 Cumulative Traffic Conditions – Saturday Field Event**

Review of column (2) of *Table 10-4* indicates that one (1) of the seven (7) evaluated freeway segments is forecast to operate at an unacceptable level of service during the Saturday Event Arrival peak hour under Year 2020 Cumulative traffic conditions when compared to the LOS standards defined in this report (i.e. key freeway segment #4; SR-57 Freeway). The remaining six (6) freeway segments located along the SR-57 and SR-91 Freeways are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2020 Cumulative traffic conditions.

#### **10.3.2 Year 2020 Cumulative Plus Project Traffic Conditions – Saturday Field Event**

Review of columns (3) and (4) of *Table 10-4* indicates that with the addition of Project traffic, two (2) of the seven (7) evaluated freeway segments are forecast to operate at an unacceptable level of service during the Saturday Event Arrival peak hour and/or Saturday Event Departure peak hour under Year 2020 Cumulative plus Project traffic conditions when compared to the LOS standards defined in this report (i.e. key freeway segment #4; SR-57 Freeway and key freeway segment #6; SR-91 Freeway). The Project's contribution to the freeway system can be considered significantly impacted at these two (2) freeway mainline locations under this traffic scenario. The remaining five (5) freeway segments located along the SR-57 and SR-91 Freeways are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2020 Cumulative plus Project traffic conditions.

*Appendix K* contains the Basic Freeway Segment Analysis calculation worksheets for the seven (7) freeway segments for Year 2020 Cumulative Saturday traffic conditions.

TABLE 10-4

## YEAR 2020 CUMULATIVE SATURDAY PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY – FIELD EVENT

Key Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Year 2020 Cumulative Traffic Conditions			(3) Year 2020 Cumulative Plus Project Traffic Conditions			(4) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
1. SR-57 Northbound <i>south of</i> Chapman Avenue	Sat. Arrival	1,408	21.7	C	1,436	22.1	C	1,469	22.6	C	No
	Sat. Departure	1,448	22.3	C	1,476	22.7	C	1,480	22.8	C	No
2. SR-57 Northbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,312	20.2	C	1,339	20.6	C	1,345	20.7	C	No
	Sat. Departure	1,352	20.8	C	1,381	21.2	C	1,408	21.7	C	No
3. SR-57 Southbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,489	22.9	C	1,521	23.5	C	1,547	23.9	C	No
	Sat. Departure	1,474	22.7	C	1,506	23.2	C	1,509	23.3	C	No
4. SR-57 Southbound <i>south of</i> Chapman Avenue	Sat. Arrival	2,048	34.7	D	<b>2,088</b>	<b>35.8</b>	<b>E</b>	<b>2,102</b>	<b>36.2</b>	<b>E</b>	<b>Yes</b>
	Sat. Departure	2,019	33.9	D	2,059	35.0	D	<b>2,120</b>	<b>36.7</b>	<b>E</b>	<b>Yes</b>
6. SR-91 Westbound <i>west of</i> Harbor Boulevard	Sat. Arrival	2,008	33.6	D	2,048	34.7	D	<b>2,061</b>	<b>35.1</b>	<b>E</b>	<b>Yes</b>
	Sat. Departure	1,950	32.1	D	1,988	33.1	D	2,050	34.7	D	No
7. SR-91 Eastbound <i>west of</i> Harbor Boulevard	Sat. Arrival	1,878	30.4	D	1,918	31.3	D	1,967	32.6	D	No
	Sat. Departure	1,850	29.8	D	1,889	30.7	D	1,895	30.8	D	No
8. SR-91 Eastbound <i>east of</i> Lemon Street	Sat. Arrival	1,566	24.2	C	1,598	24.8	C	1,601	24.9	C	No
	Sat. Departure	1,560	24.1	C	1,592	24.7	C	1,605	24.9	C	No

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

## **10.4 Year 2030 Buildout Plus Project Basic Freeway Segment Capacity Analysis – Saturday Field Event**

*Table 10-5* summarizes the peak hour level of service results at the seven (7) key freeway segments located along the SR-57 and SR-91 Freeways for Year 2030 Buildout traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour. The first column (1) presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions. The second column (2) presents Year 2030 Buildout Saturday traffic conditions and the third column (3) presents Year 2030 Buildout plus Project Saturday traffic conditions. The fourth (4) column indicates whether the traffic associated with the proposed project will have an impact based on the LOS standards defined in this report.

### **10.4.1 Year 2030 Buildout Traffic Conditions – Saturday Field Event**

Review of column (2) of *Table 10-5* indicates that three (3) of the seven (7) evaluated freeway segments are forecast to operate at unacceptable levels of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2030 Buildout traffic conditions when compared to the LOS standards defined in this report (i.e. key freeway segment #4; SR-57 Freeway, key freeway segment #6; SR-91 Freeway and key freeway segment #7; SR-91 Freeway). The remaining four (4) freeway segments located along the SR-57 and SR-91 Freeways are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2030 Buildout traffic conditions.

### **10.4.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event**

Review of columns (3) and (4) of *Table 10-5* indicates that with the addition of Project traffic, three (3) of the seven (7) evaluated freeway segments are forecast to operate at an unacceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2030 Buildout plus Project traffic conditions when compared to the LOS standards defined in this report (i.e. key freeway segment #4; SR-57 Freeway, key freeway segment #6; SR-91 Freeway and key freeway segment #7; SR-91 Freeway). The Project's contribution to the freeway system can be considered significantly impacted at these three (3) freeway mainline locations under this traffic scenario. The remaining four (4) freeway segments located along the SR-57 and SR-91 Freeways are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2030 Buildout plus Project traffic conditions.

*Appendix K* contains the Basic Freeway Segment Analysis calculation worksheets for the seven (7) freeway segments for Year 2030 Buildout Saturday traffic conditions.

## 10.5 Freeway Segment Traffic Improvements

A review of the level of service calculations summarized in *Tables 10-3 through 10-5* indicates that the development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact one (1) of the seven (7) freeway segments under Existing plus Project Saturday traffic conditions, two (2) of the seven (7) freeway segments under Year 2020 Cumulative plus Project Saturday traffic conditions and three (3) of the seven (7) freeway segments under Year 2030 Buildout plus Project Saturday traffic conditions. However, the SR-57 and SR-91 Freeways are controlled exclusively by the State of California and there is no mechanism by which the lead agency can construct or guarantee the construction of any improvements to these freeway segments. Therefore, the proposed Project's incremental impacts on key freeway study segments assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative mainline impacts to below significance thresholds or achieve acceptable service level goals.

TABLE 10-5

## YEAR 2030 BUILDOUT SATURDAY PEAK HOUR FREEWAY MAINLINE CAPACITY ANALYSIS SUMMARY – FIELD EVENT

Key Basic Freeway Segment	Time Period	(1) Existing Traffic Conditions			(2) Year 2030 Buildout Traffic Conditions			(3) Year 2030 Buildout Plus Project Traffic Conditions			(4) Significant Impact
		Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Peak Hour Volume (pc/h/ln)	Density (pc/mi/ln)	LOS	Yes/No
1. SR-57 Northbound <i>south of</i> Chapman Avenue	Sat. Arrival	1,408	21.7	C	1,672	26.1	D	1,703	26.7	D	No
	Sat. Departure	1,448	22.3	C	1,719	27.0	D	1,723	27.1	D	No
2. SR-57 Northbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,312	20.2	C	1,586	24.6	C	1,591	24.7	C	No
	Sat. Departure	1,352	20.8	C	1,634	25.5	C	1,660	25.9	C	No
3. SR-57 Southbound <i>north of</i> Nutwood Avenue	Sat. Arrival	1,489	22.9	C	1,764	28.0	D	1,789	28.4	D	No
	Sat. Departure	1,474	22.7	C	1,746	27.6	D	1,748	27.6	D	No
4. SR-57 Southbound <i>south of</i> Chapman Avenue	Sat. Arrival	2,048	34.7	D	<b>2,432</b>	[a]	F	<b>2,445</b>	[a]	F	Yes
	Sat. Departure	2,019	33.9	D	<b>2,398</b>	[a]	F	<b>2,456</b>	[a]	F	Yes
6. SR-91 Westbound <i>west of</i> Harbor Boulevard	Sat. Arrival	2,008	33.6	D	<b>2,394</b>	[a]	F	<b>2,407</b>	[a]	F	Yes
	Sat. Departure	1,950	32.1	D	<b>2,325</b>	<b>44.0</b>	E	<b>2,384</b>	[a]	F	Yes
7. SR-91 Eastbound <i>west of</i> Harbor Boulevard	Sat. Arrival	1,878	30.4	D	<b>2,239</b>	<b>40.7</b>	E	<b>2,286</b>	<b>42.4</b>	E	Yes
	Sat. Departure	1,850	29.8	D	<b>2,209</b>	<b>39.7</b>	E	<b>2,214</b>	<b>39.8</b>	E	Yes
8. SR-91 Eastbound <i>east of</i> Lemon Street	Sat. Arrival	1,566	24.2	C	1,860	30.0	D	1,863	30.0	D	No
	Sat. Departure	1,560	24.1	C	1,853	29.8	D	1,865	30.1	D	No

Notes:

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria
- [a] = *HCS 7* software does not report a density value for mainline segments operating at LOS F.

## 10.6 Freeway Merge/Diverge Ramp Junction Analysis – Saturday Field Event

This section of the report presents a Saturday Freeway Ramp (Merge/Diverge) Analysis for the SR-57 Interchanges at Chapman Avenue and Nutwood Avenue and the SR-91 Interchanges at Harbor Boulevard and Lemon Street. The analysis is consistent with Caltrans requirements and has been prepared using the methods provided in the *Highway Capacity Manual 6 (HCM 6)*.

As stated previously in Section 10.1, a merge/diverge analysis is not required for the Weekday PM peak hour (academic instruction) since the Caltrans criteria required for further analysis is not satisfied.

### 10.6.1 Existing Plus Project Ramp Junction Analysis – Saturday Field Event

**Table 10-6** summarizes the peak hour Level of Service results at the seven (7) freeway ramp junctions for Existing plus Project Saturday traffic conditions. The first column (1) presents a summary of existing Saturday Event Arrival peak hour and Saturday Event Departure peak hour traffic conditions. The second column (2) presents Existing Plus Project traffic conditions and the third column (3) indicates whether the traffic associated with the Project will have an impact based on the LOS standards defined in this report.

#### 10.6.1.1 Existing Traffic Conditions – Saturday Field Event

Review of column (1) of *Table 10-6* indicates that one (1) of the seven (7) freeway ramps currently operates at an unacceptable level of service during the Saturday Event Arrival peak hour when compared to the LOS standards defined in this report (i.e. #7 – diverge segment). The remaining six (6) freeway ramps currently operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour.

#### 10.6.1.2 Existing Plus Project Traffic Conditions – Saturday Field Event

Review of columns (2) and (3) of *Table 10-6* indicates that traffic associated with the proposed Project **will not** significantly impact any of the seven (7) freeway ramps when compared to the LOS standards and significant impact criteria specified in this report. Although location #7 is forecast to operate at an unacceptable LOS during the Saturday Event Arrival peak hour, this location is not impacted per the significant impact criteria specified in this report, as the existing level of service is maintained. The remaining six (6) freeway ramps are forecast to continue to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under existing plus project traffic conditions.

**Appendix L** contains the Freeway Merge/Diverge Ramp Junction Analysis calculation worksheets for the seven (7) freeway segments for Existing Plus Project Saturday traffic conditions.

**TABLE 10-6**  
**EXISTING PLUS PROJECT SATURDAY PEAK HOUR MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY – FIELD EVENT**

Key Freeway Merge or Diverge Segment	Analysis Type	Time Period	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions				(3) Significant Impact
			Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/lane)	LOS	Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/lane)	LOS	Yes/No
1. SR-57 Northbound Off-Ramp <i>to</i> Chapman Avenue	Diverge Analysis	Sat. Arrival	7,865	789	18.6	B	8,049	973	20.1	C	No
		Sat. Departure	8,086	811	19.4	B	8,107	832	19.6	B	No
2. SR-57 Northbound On-Ramp <i>from</i> Nutwood Avenue	Merge Analysis	Sat. Arrival	6,629	698	20.5	C	6,629	731	20.7	C	No
		Sat. Departure	6,866	689	21.0	C	6,866	842	22.2	C	No
3. SR-57 Southbound Off-Ramp <i>to</i> Nutwood Avenue	Diverge Analysis	Sat. Arrival	6,931	626	16.3	B	7,054	749	17.4	B	No
		Sat. Departure	6,862	609	16.0	B	6,876	623	16.2	B	No
4. SR-57 Southbound On-Ramp <i>from</i> Chapman Avenue	Merge Analysis	Sat. Arrival	6,859	767	30.7	D	6,859	817	31.1	D	No
		Sat. Departure	6,734	784	30.4	D	6,734	1,013	32.2	D	No
6. SR-91 Westbound On-Ramp <i>from</i> Harbor Boulevard	Merge Analysis	Sat. Arrival	6,385	1,093	31.0	D	6,385	1,143	31.4	D	No
		Sat. Departure	6,226	1,035	30.0	D	6,226	1,265	31.8	D	No
7. SR-91 Eastbound Off-Ramp <i>to</i> Harbor Boulevard	Diverge Analysis	Sat. Arrival	<b>6,994</b>	<b>1,082</b>	<b>35.4</b>	<b>E</b>	<b>7,179</b>	<b>1,267</b>	<b>37.2</b>	<b>E</b>	No
		Sat. Departure	6,891	970	34.5	D	6,912	991	34.6	D	No
8. SR-91 Eastbound On-Ramp <i>from</i> Lemon Street	Merge Analysis	Sat. Arrival	5,912	1,380	22.1	C	5,912	1,393	22.2	C	No
		Sat. Departure	5,921	1,342	21.8	C	5,921	1,403	22.3	C	No

**Notes:**

- pc/mi/lane = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria



### **10.6.2 Year 2020 Cumulative Ramp Junction Analysis – Saturday Field Event**

*Table 10-7* summarizes the peak hour Level of Service results at the seven (7) freeway ramp junctions for Year 2020 Cumulative Saturday traffic conditions. The first column (1) presents forecast Year 2020 Cumulative traffic conditions and the second column (2) presents forecast Year 2020 Cumulative Plus Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will have an impact based on the LOS standards defined in this report.

#### **10.6.2.1 Year 2020 Cumulative Traffic Conditions – Saturday Field Event**

Review of column (1) of *Table 10-7* indicates that one (1) of the seven (7) freeway ramps is forecast to operate at an unacceptable level of service in the Year 2020 during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour (i.e. #7 – diverge segment). The remaining six (6) freeway ramps are forecast to operate at an acceptable level of service under Year 2020 Cumulative traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour.

#### **10.6.2.2 Year 2020 Cumulative Plus Project Traffic Conditions – Saturday Field Event**

Review of columns (2) and (3) of *Table 10-7* indicates that one (1) of the seven (7) freeway ramps is forecast to continue to operate at an unacceptable level of service under Year 2020 Cumulative plus Project traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour, when compared to the LOS standards defined in this report (i.e. #7 – diverge segment). The Project's contribution to the freeway system can be considered significantly impacted at this one (1) freeway ramp under this traffic scenario. The remaining six (6) freeway ramps are forecast to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2020 Cumulative plus Project traffic conditions.

*Appendix L* contains the Freeway Merge/Diverge Ramp Junction Analysis calculation worksheets for the seven (7) freeway segments for Year 2020 Cumulative Plus Project Saturday traffic conditions.

**TABLE 10-7**  
**YEAR 2020 CUMULATIVE SATURDAY PEAK HOUR MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY– FIELD EVENT**

Key Freeway Merge or Diverge Segment	Analysis Type	Time Period	(1) Year 2020 Cumulative Traffic Conditions				(2) Year 2020 Cumulative Plus Project Traffic Conditions				(3) Significant Impact
			Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Yes/No
1. SR-57 Northbound Off-Ramp <i>to</i> Chapman Avenue	Diverge Analysis	Sat. Arrival	8,023	798	19.1	B	8,207	982	20.7	C	No
		Sat. Departure	8,248	820	19.9	B	8,269	841	20.1	C	No
2. SR-57 Northbound On-Ramp <i>from</i> Nutwood Avenue	Merge Analysis	Sat. Arrival	6,774	707	20.9	C	6,774	740	21.2	C	No
		Sat. Departure	7,015	698	21.4	C	7,015	851	22.6	C	No
3. SR-57 Southbound Off-Ramp <i>to</i> Nutwood Avenue	Diverge Analysis	Sat. Arrival	7,079	637	16.9	B	7,202	760	17.9	B	No
		Sat. Departure	7,010	620	16.6	B	7,024	634	16.7	B	No
4. SR-57 Southbound On-Ramp <i>from</i> Chapman Avenue	Merge Analysis	Sat. Arrival	7,002	776	31.3	D	7,002	826	31.7	D	No
		Sat. Departure	6,876	792	31.0	D	6,876	1,021	32.8	D	No
6. SR-91 Westbound On-Ramp <i>from</i> Harbor Boulevard	Merge Analysis	Sat. Arrival	6,515	1,111	31.6	D	6,515	1,161	32.0	D	No
		Sat. Departure	6,353	1,052	30.6	D	6,353	1,282	32.4	D	No
7. SR-91 Eastbound Off-Ramp <i>to</i> Harbor Boulevard	Diverge Analysis	Sat. Arrival	<b>7,141</b>	<b>1,102</b>	<b>36.1</b>	E	<b>7,326</b>	<b>1,287</b>	<b>37.8</b>	E	No
		Sat. Departure	<b>7,036</b>	<b>988</b>	<b>35.1</b>	E	<b>7,057</b>	<b>1,009</b>	<b>35.3</b>	E	Yes
8. SR-91 Eastbound On-Ramp <i>from</i> Lemon Street	Merge Analysis	Sat. Arrival	6,039	1,399	22.6	C	6,039	1,412	22.7	C	No
		Sat. Departure	6,048	1,361	22.3	C	6,048	1,422	22.8	C	No

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

### **10.6.3 Year 2030 Buildout Ramp Junction Analysis – Saturday Field Event**

*Table 10-8* summarizes the peak hour Level of Service results at the seven (7) freeway ramp junctions for Year 2030 Buildout Saturday traffic conditions. The first column (1) presents forecast Year 2030 Buildout traffic conditions and the second column (2) presents forecast Year 2030 Buildout Plus Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will have an impact based on the LOS standards defined in this report.

#### **10.6.3.1 Year 2030 Buildout Traffic Conditions – Saturday Field Event**

Review of column (1) of *Table 10-8* indicates that three (3) of the seven (7) freeway ramps are forecast to operate at an unacceptable level of service in the Year 2030 during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour (i.e. #4 – merge segment, #6 – merge segment and #7 – diverge segment). The remaining four (4) freeway ramps are forecast to operate at an acceptable level of service under Year 2030 Buildout traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour.

#### **10.6.3.2 Year 2030 Buildout Plus Project Traffic Conditions – Saturday Field Event**

Review of columns (2) and (3) of *Table 10-8* indicates that three (3) of the seven (7) freeway ramps are forecast to continue to operate at an unacceptable level of service under Year 2030 Buildout plus Project traffic conditions during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour, when compared to the LOS standards defined in this report (i.e. #4 – merge segment, #6 – merge segment and #7 – diverge segment). The Project's contribution to the freeway system can be considered significantly impacted at these three (3) freeway ramps under this traffic scenario. The remaining four (4) freeway ramps are forecast to operate at an acceptable level of service during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour under Year 2030 Buildout plus Project traffic conditions.

*Appendix L* contains the Freeway Merge/Diverge Ramp Junction Analysis calculation worksheets for the seven (7) freeway segments for Year 2030 Buildout Plus Project Saturday traffic conditions.

### **10.6.4 Freeway Ramp Junction Traffic Improvements**

A review of the level of service calculations summarized in *Tables 10-6* through *10-8* indicates that the development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact none of the seven (7) freeway ramp junctions under Existing plus Project Saturday traffic conditions, one (1) of the seven (7) freeway ramp junctions under Year 2020 Cumulative plus Project Saturday traffic conditions, and three (3) of the seven (7) freeway ramp junctions under Year 2030 Buildout plus Project Saturday traffic conditions. However, the SR-57 and SR-91 Freeways are controlled exclusively by the State and there is no mechanism by which the lead agency can construct or guarantee the construction of any improvements to these ramp junctions. Therefore, the proposed Project's incremental impacts on the freeway ramp junctions assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative impacts to below significance thresholds or achieve acceptable service level goals.

**TABLE 10-8**  
**YEAR 2030 BUILDOUT SATURDAY PEAK HOUR MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY– FIELD EVENT**

Key Freeway Merge or Diverge Segment	Analysis Type	Time Period	(1) Year 2030 Buildout Traffic Conditions				(2) Year 2030 Buildout Plus Project Traffic Conditions				(3) Significant Impact
			Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Freeway Pk Hr Volume	Ramp Pk Hr Volume	Density (pc/mi/ln)	LOS	Yes/No
1. SR-57 Northbound Off-Ramp <i>to</i> Chapman Avenue	Diverge Analysis	Sat. Arrival	9,832	984	23.8	C	10,016	1,168	25.3	C	No
		Sat. Departure	10,108	1,008	24.7	C	10,129	1,029	24.9	C	No
2. SR-57 Northbound On-Ramp <i>from</i> Nutwood Avenue	Merge Analysis	Sat. Arrival	8,289	1,035	25.8	C	8,289	1,068	26.1	C	No
		Sat. Departure	8,583	1,025	26.5	C	8,583	1,178	27.6	C	No
3. SR-57 Southbound Off-Ramp <i>to</i> Nutwood Avenue	Diverge Analysis	Sat. Arrival	8,645	849	21.4	C	8,768	972	22.4	C	No
		Sat. Departure	8,553	830	21.0	C	8,567	844	21.2	C	No
4. SR-57 Southbound On-Ramp <i>from</i> Chapman Avenue	Merge Analysis	Sat. Arrival	<b>8,460</b>	<b>1,073</b>	<b>36.7</b>	<b>F</b>	<b>8,460</b>	<b>1,123</b>	<b>37.0</b>	<b>F</b>	<b>Yes</b>
		Sat. Departure	<b>8,307</b>	<b>1,091</b>	<b>36.3</b>	<b>F</b>	<b>8,307</b>	<b>1,320</b>	<b>38.0</b>	<b>F</b>	<b>Yes</b>
6. SR-91 Westbound On-Ramp <i>from</i> Harbor Boulevard	Merge Analysis	Sat. Arrival	<b>7,948</b>	<b>1,437</b>	<b>37.1</b>	<b>F</b>	<b>7,948</b>	<b>1,487</b>	<b>37.4</b>	<b>F</b>	<b>Yes</b>
		Sat. Departure	<b>7,742</b>	<b>1,372</b>	<b>35.9</b>	<b>E</b>	<b>7,742</b>	<b>1,602</b>	<b>37.7</b>	<b>F</b>	<b>Yes</b>
7. SR-91 Eastbound Off-Ramp <i>to</i> Harbor Boulevard	Diverge Analysis	Sat. Arrival	<b>8,778</b>	<b>1,393</b>	<b>42.1</b>	<b>E</b>	<b>8,963</b>	<b>1,578</b>	<b>43.7</b>	<b>E</b>	No
		Sat. Departure	<b>8,659</b>	<b>1,270</b>	<b>41.1</b>	<b>E</b>	<b>8,680</b>	<b>1,291</b>	<b>41.2</b>	<b>E</b>	<b>Yes</b>
8. SR-91 Eastbound On-Ramp <i>from</i> Lemon Street	Merge Analysis	Sat. Arrival	7,385	1,730	25.9	C	7,385	1,743	26.0	C	No
		Sat. Departure	7,389	1,689	25.6	C	7,389	1,750	26.1	C	No

**Notes:**

- pc/mi/ln = Passenger cars per mile per lane (density)
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- **Bold Volume/Density/LOS values** indicate adverse service levels based on the Caltrans LOS Criteria

## 11.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where, based on City criteria, projected traffic volumes are expected to result in significant impacts, this report identifies roadway improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or restriping to reconfigure (add lanes) to specific approaches of an intersection. The identified improvements are expected to:

- mitigate the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative project) traffic and
- improve Levels of Service to an acceptable range and/or to pre-project conditions.

### 11.1 Existing Plus Project Recommended Improvements

#### 11.1.1 Weekday Academic Instruction

The results of the intersection capacity analysis presented previously in *Table 8-1* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Existing Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

#### 11.1.2 Saturday Field Event

The results of the intersection capacity analysis presented previously in *Table 8-2* shows that the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections under the “Existing Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the existing plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

**Figure 11-1** graphically illustrates the Existing plus Project Saturday recommended improvements.

## 11.2 Year 2020 Plus Project Recommended Improvements

### 11.2.1 Weekday Academic Instruction

The results of the intersection capacity analysis presented previously in *Table 8-3* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

### 11.2.2 Saturday Field Event

The results of the intersection capacity analysis presented previously in *Table 8-4* shows that the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the Year 2020 plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

**Figure 11-2** graphically illustrates the Year 2020 plus Project Saturday recommended improvements.

## 11.3 Year 2030 Buildout Plus Project Recommended Improvements

### 11.3.1 Weekday Academic Instruction

The results of the intersection capacity analysis presented previously in *Table 8-5* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Year 2030 Buildout Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

### 11.3.2 Saturday Field Event

The results of the intersection capacity analysis presented previously in *Table 8-6* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Year 2030 Buildout Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the Year 2030 buildout plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 12 – State College Boulevard at Chapman Avenue:** Widen and restripe the westbound approach of Chapman Avenue to provide a 2<sup>nd</sup> westbound left-turn lane. Modify the existing traffic signal as necessary. Right-of-way acquisition will be required. Source: *CollegeTown Draft Environmental Impact Report (DEIR)*. The installation of these improvements is subject to the approval of the City of Fullerton. Since the proposed Project cannot guarantee that these improvements that are located in the City of Fullerton will be implemented, the impact is significant and unavoidable.
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event arrival period and event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

**Figure 11-3** graphically illustrates the Year 2030 Buildout plus Project Saturday recommended improvements.

## 11.4 Existing Plus Project Recommended Improvements – Caltrans Methodology

### 11.4.1 Weekday Academic Instruction

The results of the intersection capacity analysis presented previously in *Table 9-1* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the six (6) state-controlled study intersections under the “Existing Plus Project Weekday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

#### **11.4.2 Saturday Field Event**

The results of the intersection capacity analysis presented previously in *Table 9-2* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the “Existing Plus Project Saturday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

### **11.5 Year 2020 Plus Project Recommended Improvements – Caltrans Methodology**

#### **11.5.1 Weekday Academic Instruction**

The results of the intersection capacity analysis presented previously in *Table 9-3* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the six (6) state-controlled study intersections under the “Year 2020 Plus Project Weekday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

#### **11.5.2 Saturday Field Event**

The results of the intersection capacity analysis presented previously in *Table 9-4* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the “Year 2020 Plus Project Saturday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

### **11.6 Year 2030 Buildout Plus Project Recommended Improvements – Caltrans Methodology**

#### **11.6.1 Weekday Academic Instruction**

The results of the intersection capacity analysis presented previously in *Table 9-5* shows that the proposed Project (i.e. academic instruction) will significantly impact one (1) of the six (6) state-controlled study intersections under the “Year 2030 Buildout Plus Project Weekday” traffic scenario. The following are improvements recommended to mitigate the Year 2030 Buildout plus Project Weekday traffic impacts:

- **No. 14 – SR-57 NB Ramps at Chapman Avenue:** Widen and restripe the westbound approach of Chapman Avenue to provide a 3<sup>rd</sup> westbound through lane. Modify the existing traffic signal as necessary. Right-of-way acquisition will be required. Source: *CollegeTown Draft Environmental Impact Report (DEIR)*. The installation of these improvements is subject to the approval of Caltrans and the City of Fullerton. Since the proposed Project cannot guarantee that these improvements that are located in the City of Fullerton and/or also under the jurisdiction of Caltrans will be implemented, the impact is significant and unavoidable.

#### **11.6.2 Saturday Field Event**

The results of the intersection capacity analysis presented previously in *Table 9-6* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the “Year 2030 Buildout Plus Project Saturday” traffic scenario (Caltrans



Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

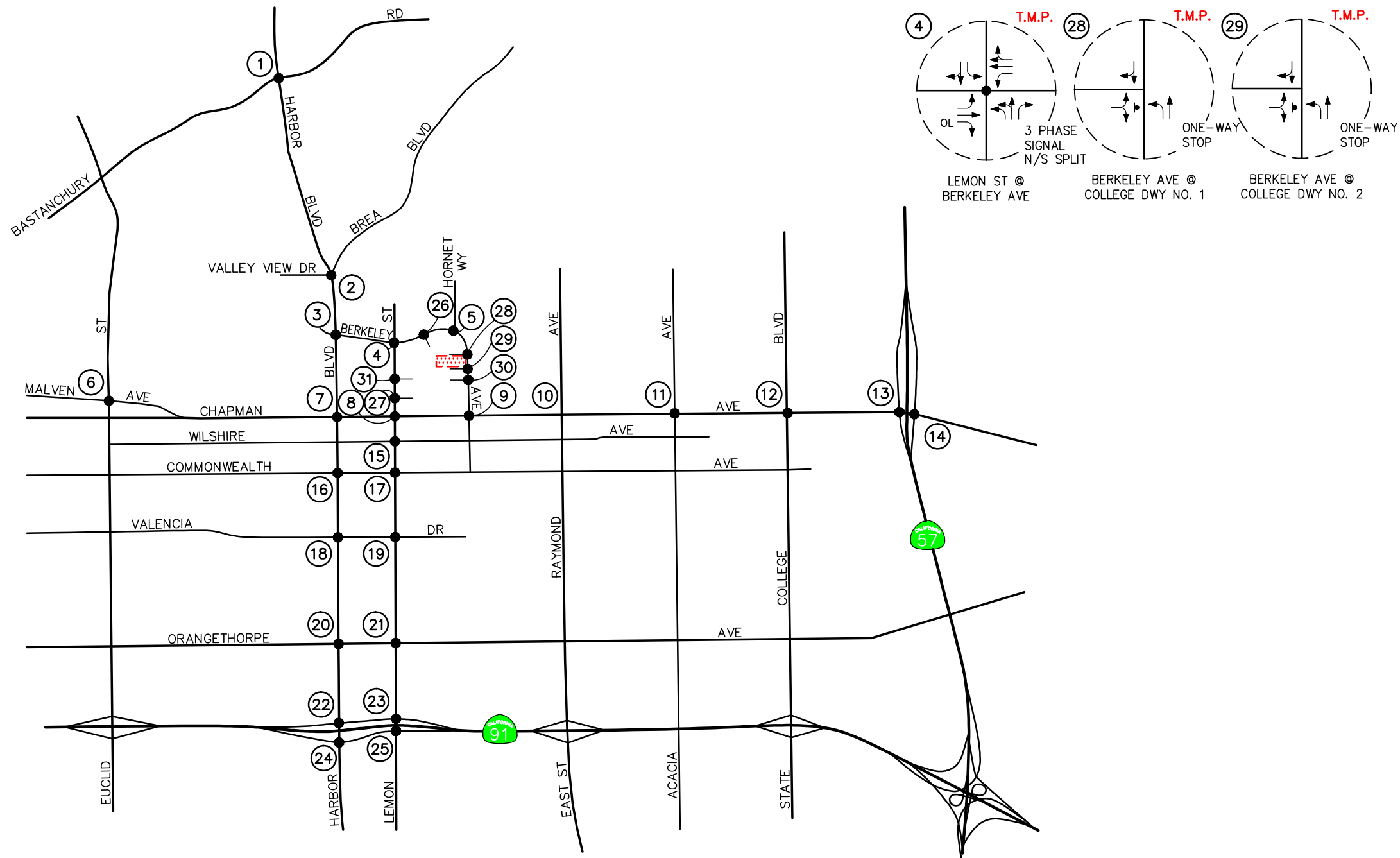
**Figure 11-4** graphically illustrates the Year 2030 Buildout plus Project Weekday (Caltrans methodology) recommended improvements.

## 11.7 Traffic Management Plan

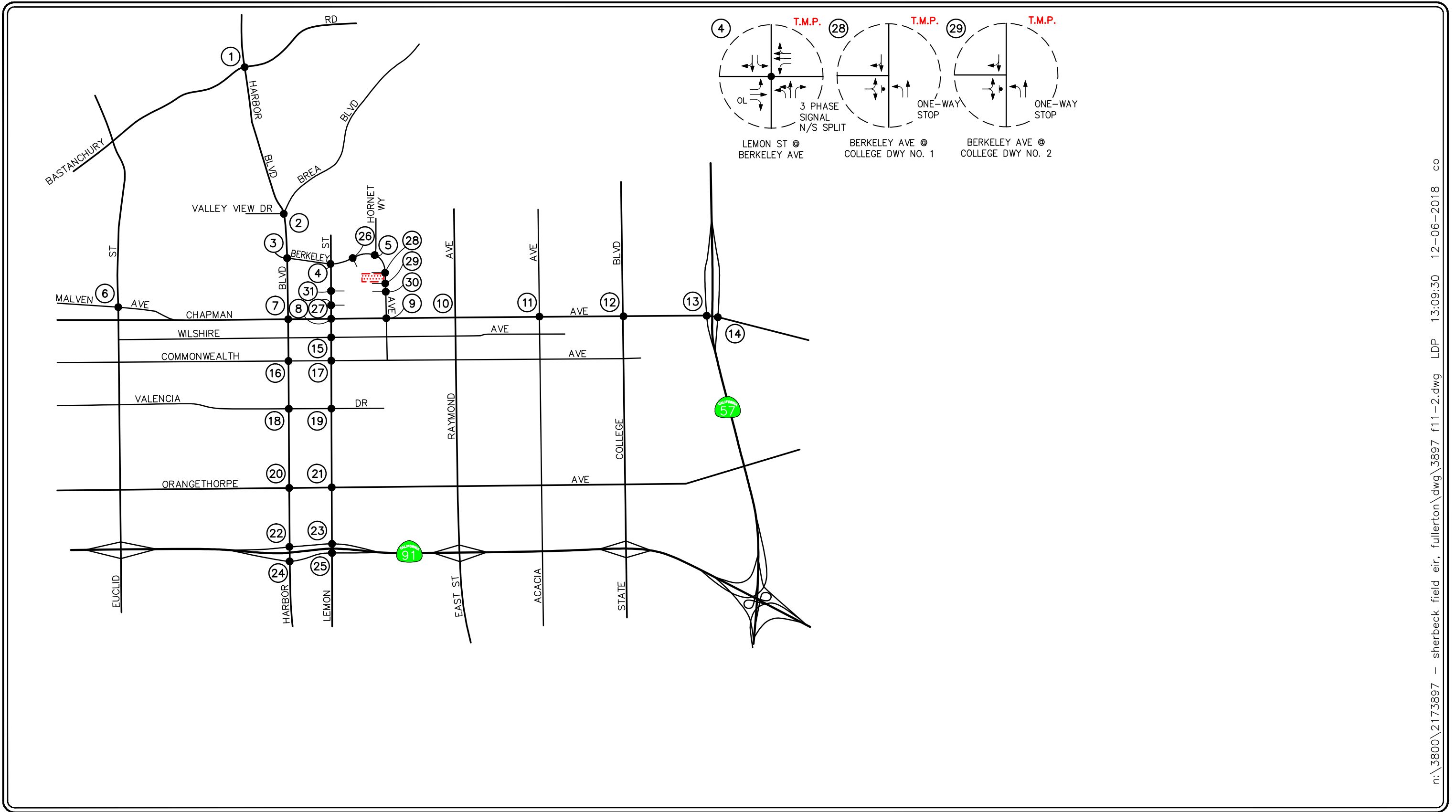
**Figure 11-5** presents the staffing component of the Traffic Management Plan (TMP) recommended during the Saturday field event arrival period for key study intersection #28. The figure identifies the potential location of police department staff that will be stationed at this location to direct traffic flows. The project traffic movements are also shown for reference. As part of the TMP, police department staff will monitor traffic congestion at this location to help minimize any traffic queues along Berkeley Avenue. Should any traffic congestion or queues occur on Berkeley Avenue during the event arrival period, police department staff controlling the intersection will direct traffic flows in a manner to reduce or minimize the traffic congestion and queues. Depending on traffic conditions on any given day, other components of the event TMP available to assist police department staff that could be deployed include routing of traffic via traffic cones/delineators as necessary and/or placement of programmable changeable message signs (PCMS).

**Figure 11-6** presents the Traffic Management Plan (TMP) staffing component recommended during the Saturday field event departure period for key study intersections #4, #28 and #29. The figure identifies the potential location of police department staff that will be stationed at these locations to direct traffic flows. The project traffic movements are also shown for reference. As part of the TMP, police department staff will monitor traffic congestion at these three locations to minimize any traffic queues along Berkeley Avenue and Lemon Street. Should any traffic congestion or queues occur on Berkeley Avenue and Lemon Street during the event departure period, police department staff controlling the intersections will direct traffic flows in a manner to reduce or minimize the traffic congestion and queues. For the intersection of Lemon Street/Berkeley Avenue (i.e. key study intersection #4), other components of the event TMP available to assist police department staff that could be deployed dependent upon traffic conditions on a specific day include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators, and/or programmable changeable message signs (PCMS). For the intersections of Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 (i.e. key study intersections #28 and #29, respectively), other components of the event TMP available to assist police department staff dependent upon traffic conditions on a specific day include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

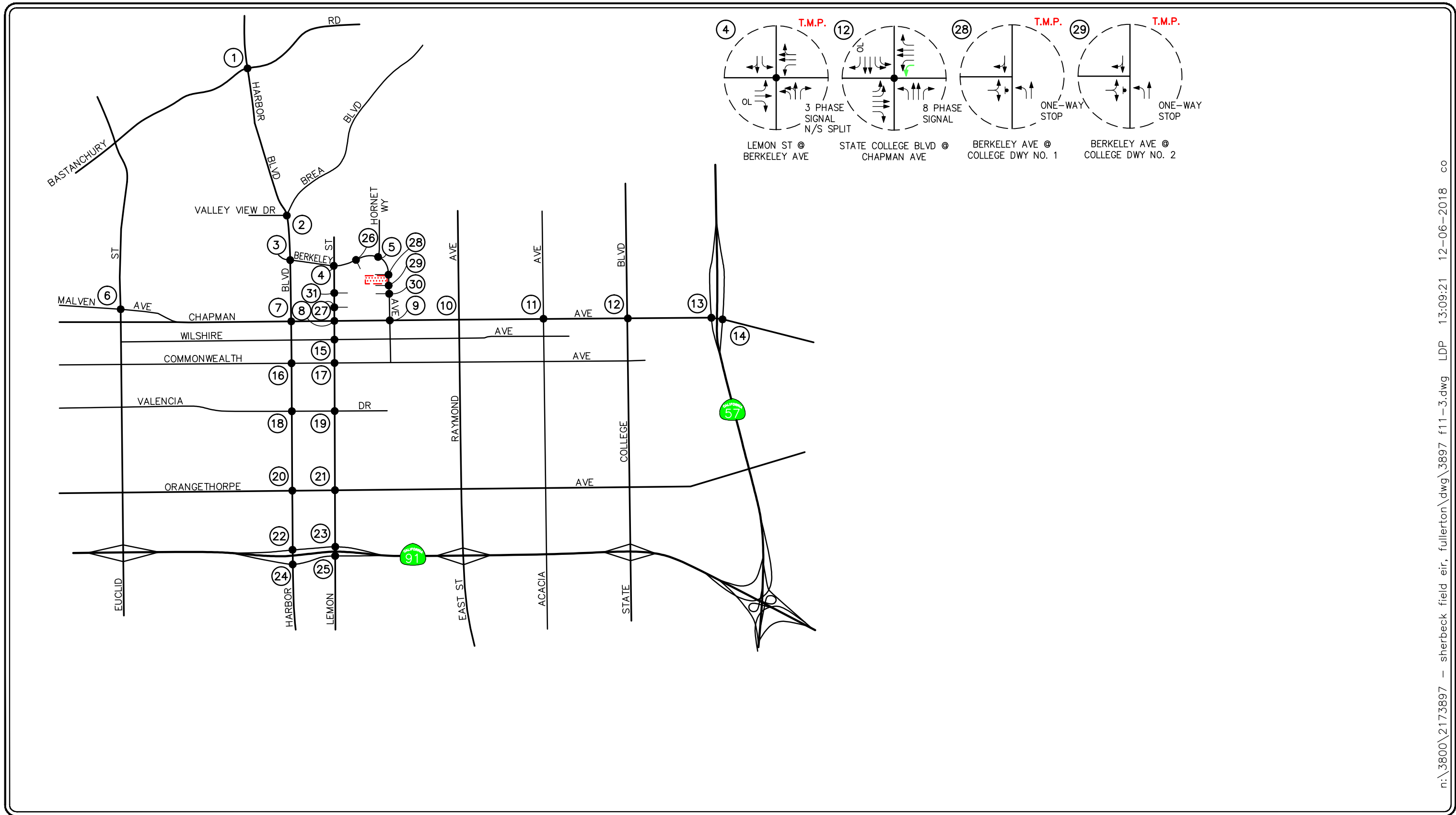
As shown on *Tables 8-2, 8-4 and 8-6*, with implementation of the TMP, which includes those strategies available to traffic control personnel as described above, the impacts at the key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 (i.e. key study intersections #4, #28 and #29, respectively) will be reduced to less than significant and these three (3) intersections will operate at an acceptable level of service under existing plus project, Year 2020 plus project and Year 2030



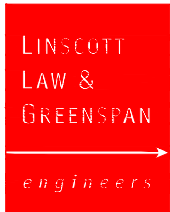
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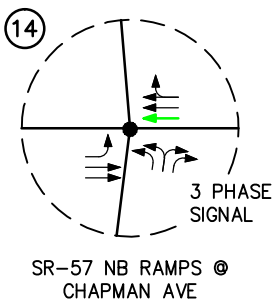
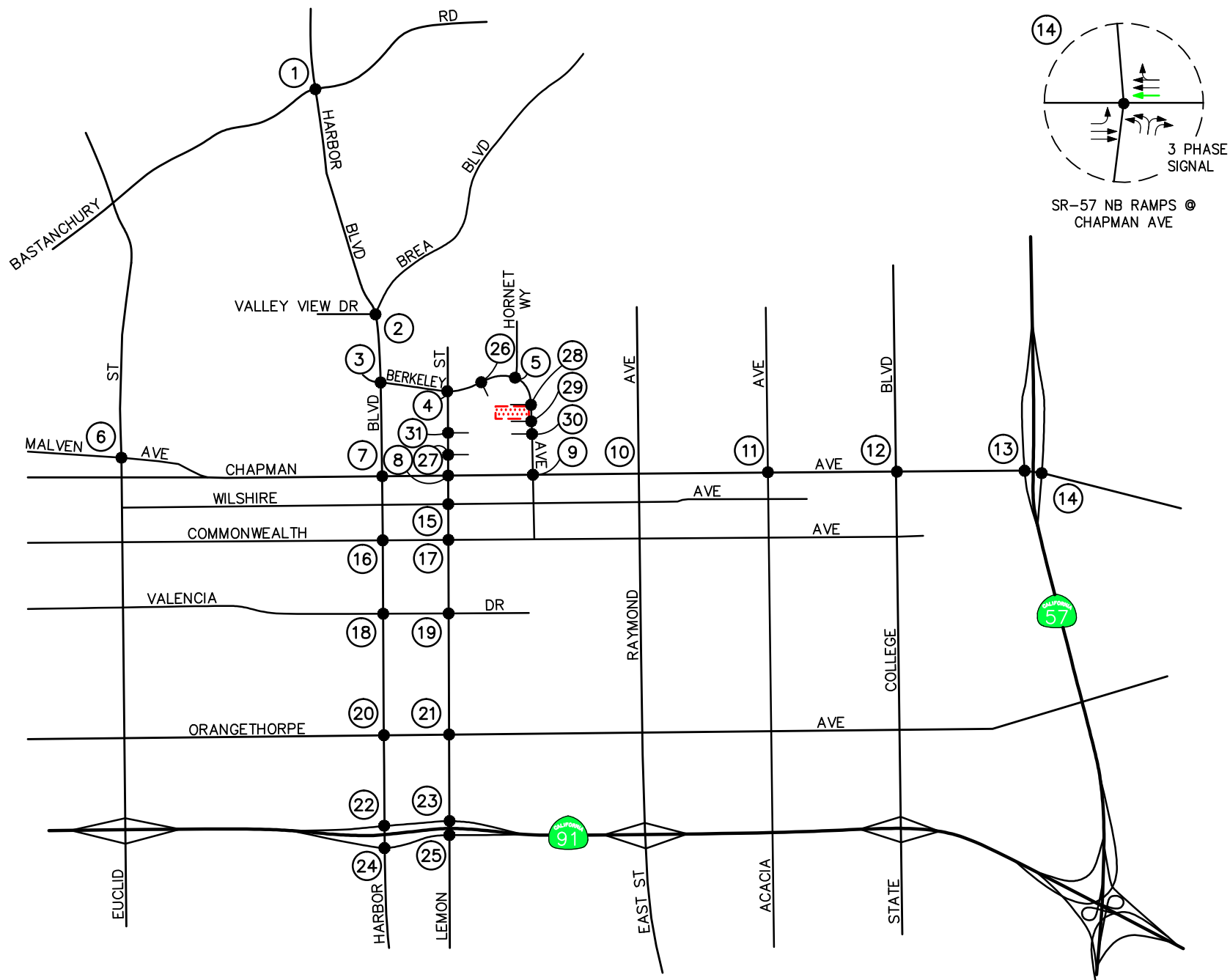


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- KEY**
- ← = APPROACH LANE ASSIGNMENT
  - = YEAR 2030 RECOMMENDED IMPROVEMENTS
  - = TRAFFIC SIGNAL, ▼ = STOP SIGN
  - T.M.P. = TRAFFIC MANAGEMENT PLAN
  - [Hatched Box] = PROJECT SITE

**FIGURE 11-3**  
**YEAR 2030 SATURDAY**  
**RECOMMENDED IMPROVEMENTS**  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



INTERSECTION #28  
BERKELEY AVE @  
COLLEGE DWY NO. 1



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
LINSCOTT  
LAW &  
GREENSPAN

engineers



NO SCALE

#### KEY

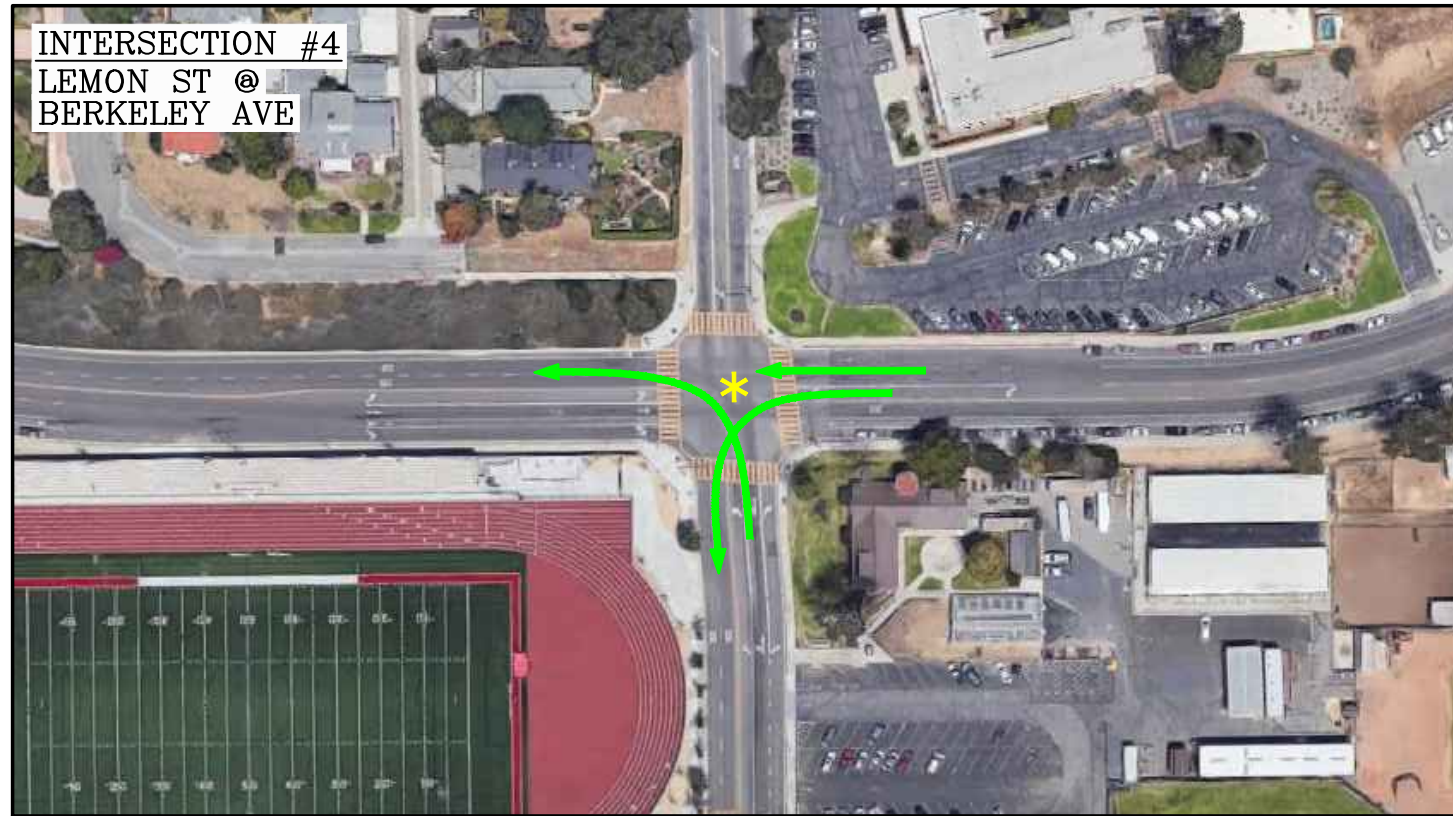
-  = POLICE DEPARTMENT STAFF
-  = PROJECT TRAFFIC MOVEMENT

## FIGURE 11-5

### TRAFFIC MANAGEMENT PLAN DETAILS SATURDAY FIELD EVENT ARRIVAL PERIOD

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





buildout plus project traffic conditions. Refer to the “with improvements” columns of *Tables 8-2, 8-4 and 8-6* presented previously in Section 8.0, which illustrates the resulting levels of service with implementation of the TMP.

## **11.8 Project-Related Fair Share Percentage Contribution**

The transportation impacts associated with the development of the proposed Project were determined based on the existing plus project, Year 2020 and Year 2030 analyses. As summarized above, the development of the proposed Project is anticipated to create significant impacts at three (3) key study intersections under existing plus project traffic conditions, at three (3) key study intersections in the Year 2020 and at five (5) key study intersections in the Year 2030. It should be noted that the intersection of SR-57 NB Ramps/Chapman Avenue (i.e. key study intersection #14) is only impacted under the Caltrans methodology. The Project is fully responsible for the existing plus project impacts and can be expected to pay a proportional “fair-share” of the improvement costs of the impacted intersections in the Year 2020 and the Year 2030 to mitigate the project’s traffic impacts.

### **11.8.1 Year 2020 Project-Related Fair Share Contribution**

Given that the Year 2020 Saturday recommended mitigation measures for the three (3) impacted key study intersections consist of the implementation of a Traffic Management Plan, the Project’s contribution will be 100.0% for all three (3) locations to offset the Year 2020 Saturday project impacts.

### **11.8.2 Year 2030 Buildout Project-Related Fair Share Contribution**

*Table 11-1* presents the percentage of net traffic impact at the study intersections impacted by the proposed Project for Year 2030 buildout traffic conditions (weekday and Saturday). As presented in this table, the first column (1) presents a total of all movements for existing conditions. The second column (2) presents future Year 2030 buildout traffic conditions. The third column (3) presents future Year 2030 buildout traffic conditions with project traffic. The fourth column (4) represents what percentage of total intersection traffic is project-related traffic.

Review of *Table 11-1* shows that the Project’s fair share contribution to offset the Year 2030 weekday and Saturday project impacts ranges between 0.6% and 100.0%.



**TABLE 11-1**  
**YEAR 2030 BUILDOUT PROJECT FAIR SHARE CONTRIBUTION**

Key Intersection		Impacted Time Period	(1) Existing Traffic	(2) Year 2030 Buildout Traffic	(3) Year 2030 Buildout Plus Project Traffic	(4) Project Percentage Share
4.	Lemon Street at Berkeley Avenue	Sat. Departure	Traffic Management Plan			100.0%
12.	State College Boulevard at Chapman Avenue	Sat. Arrival Sat. Departure	2,665 2,768	4,470 4,583	5,033 5,185	23.8% 24.9%
14.	SR-57 NB Ramps at Chapman Avenue	Weekday PM	3,477	4,708	4,716	0.6%
28.	Berkeley Avenue at College Driveway No. 1	Sat. Arrival Sat. Departure	Traffic Management Plan			100.0%
29.	Berkeley Avenue at College Driveway No. 2	Sat. Departure	Traffic Management Plan			100.0%

Notes:

Project Percentage Share (4) = [Column (3) – Column (2)] / [Column (3) – Column (1)]

## 12.0 FRIDAY FIELD EVENT ANALYSIS

This section of the report presents the findings of an Existing plus Project and Year 2020 Cumulative plus Project Friday evening traffic evaluation. The purpose of the Friday evaluation is to address City of Fullerton Staff concerns regarding a “worst case” traffic scenario if Fullerton College hosts an event at Sherbeck Field on Friday evening while Fullerton Union High School hosts a simultaneous event at their field. The following section summarizes the results of the Friday evaluation.

### 12.1 Existing Friday Traffic Volumes

In order to model the “worst case” traffic condition, existing Friday evening traffic counts were conducted at the thirty-one (31) key study intersections on Friday October 26, 2018 during the Fullerton Union High School football game with Troy High School. The football game had a start time of 7:00 PM and finished at approximately 9:45 PM with an attendance of 1,485 people.<sup>33</sup> Specifically, manual peak hour turning movement counts were conducted by Transportation Studies Inc. (TSI) between 6:00 PM and 8:00 PM (event arrival period) and between 9:00 PM and 11:00 PM (event departure period) to establish a Friday baseline traffic condition for the Event Arrival Period peak hour and the Event Departure Period peak hour.

**Figures 12-1** and **12-2** illustrate the existing Friday Event Arrival Period peak hour and existing Friday Event Departure Period peak hour traffic volumes at the key study intersections evaluated in this report, respectively.

**Appendix M** contains the detailed Friday peak hour count sheets for the key intersections evaluated in this report.

### 12.2 Project Traffic Generation and Assignment – Friday Field Event

The project trip generation for the field event presented previously in *Table 5-2* was utilized for the Friday analysis [i.e. 4,307 daily trips, 1,559 Event Arrival peak hour trips (1,228 inbound and 331 outbound) and 1,669 Event Departure peak hour trips (141 inbound and 1,528 outbound)].

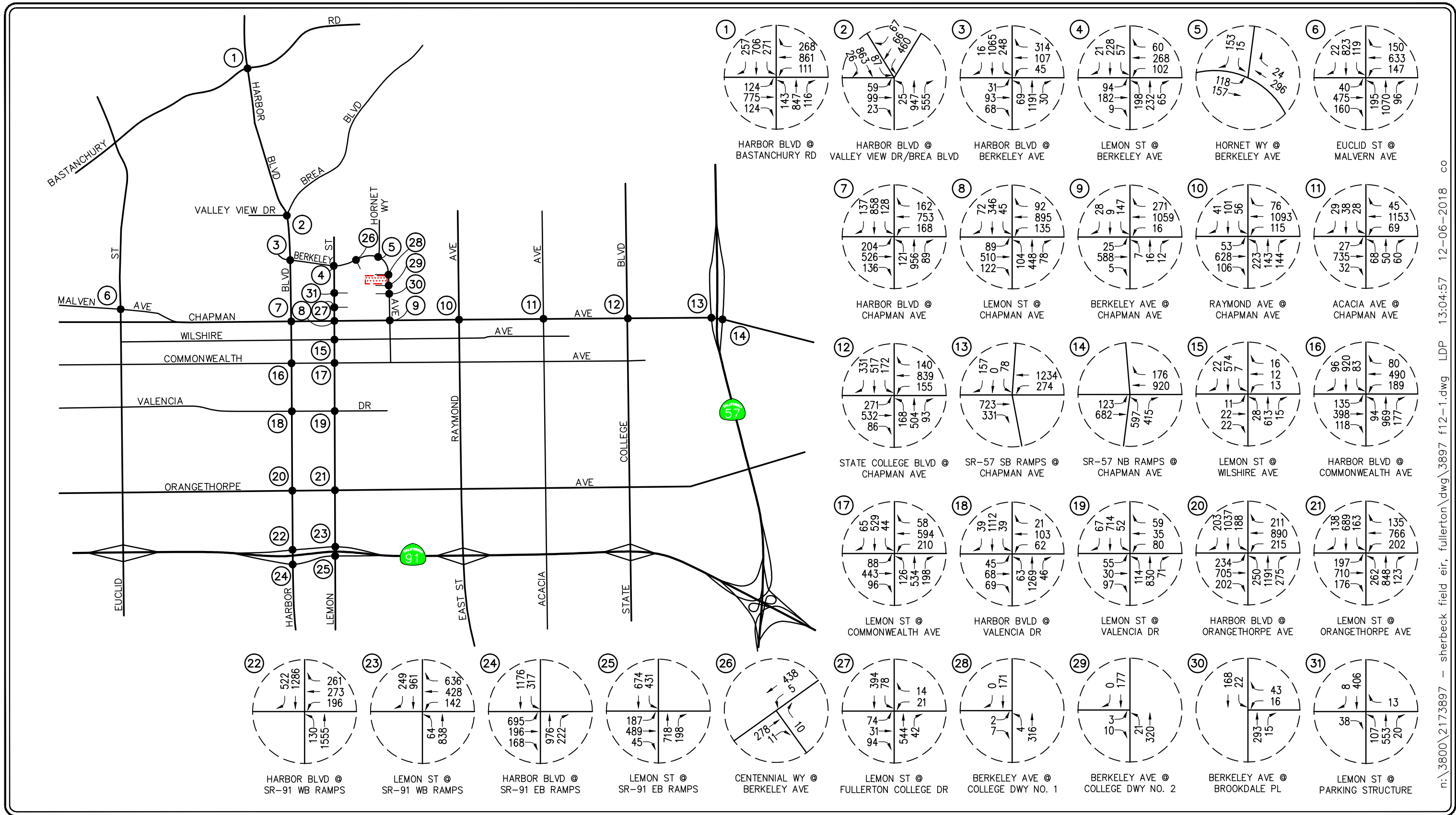
The project traffic distribution pattern presented previously in *Figure 5-3* was utilized to assign the Friday field event project trips to the key study intersections for the event arrival period and event departure period.

### 12.3 Existing Plus Project Friday Traffic Volumes

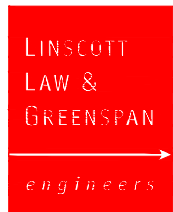
**Figures 12-3** and **12-4** present projected Friday Event Arrival Period peak hour traffic volumes and Friday Event Departure Period peak hour traffic volumes at the thirty-one (31) key study locations with the addition of the trips generated by the proposed Project (i.e. field event) to existing traffic volumes, respectively.

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<sup>33</sup> Source: Fullerton Union High School athletic director.



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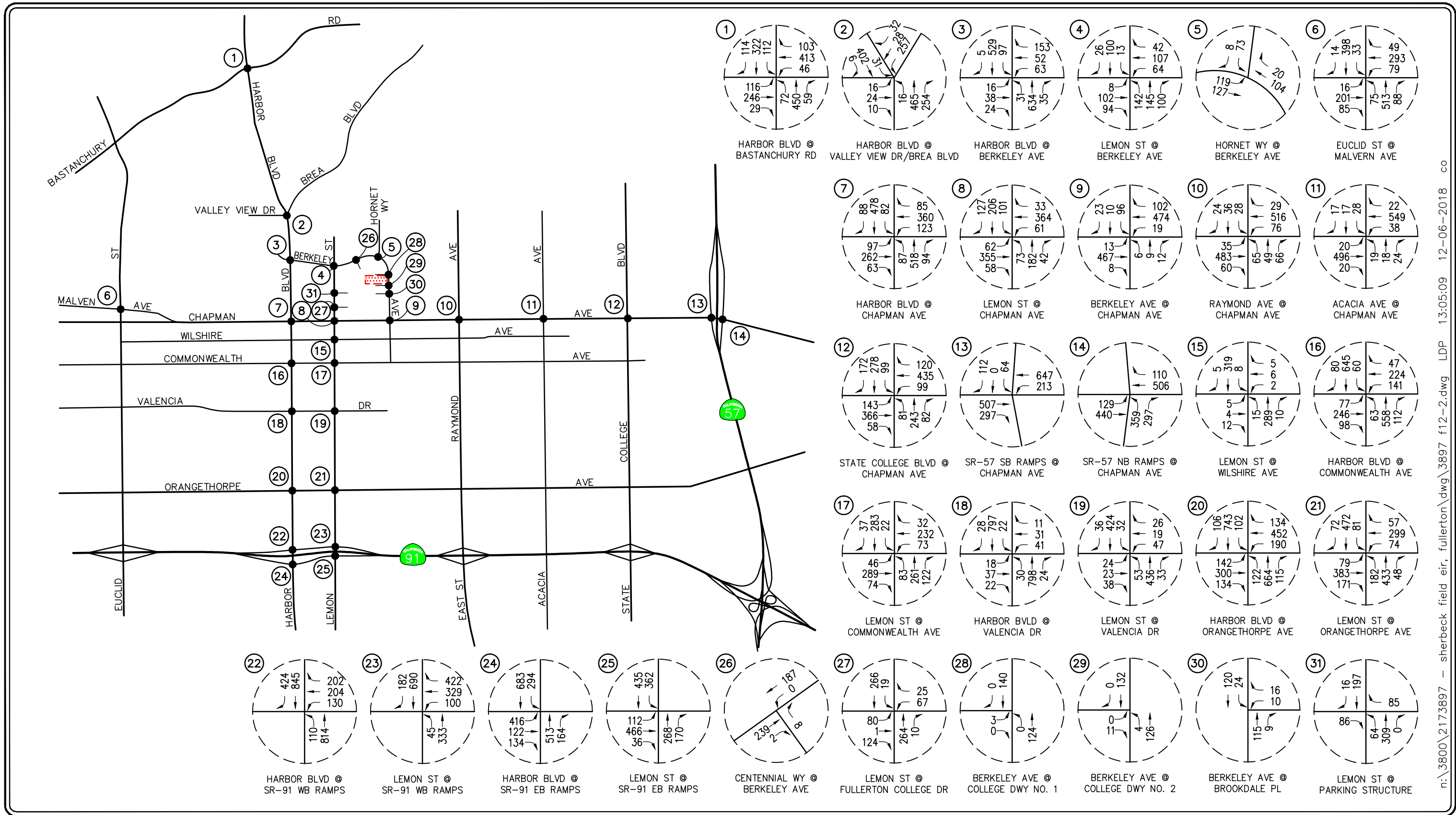


**KEY**  
 # = STUDY INTERSECTION  
 [Red Box] = PROJECT SITE

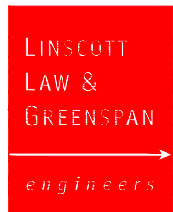
**FIGURE 12-1**

**EXISTING FRIDAY EVENT ARRIVAL PERIOD  
 PEAK HOUR TRAFFIC VOLUMES**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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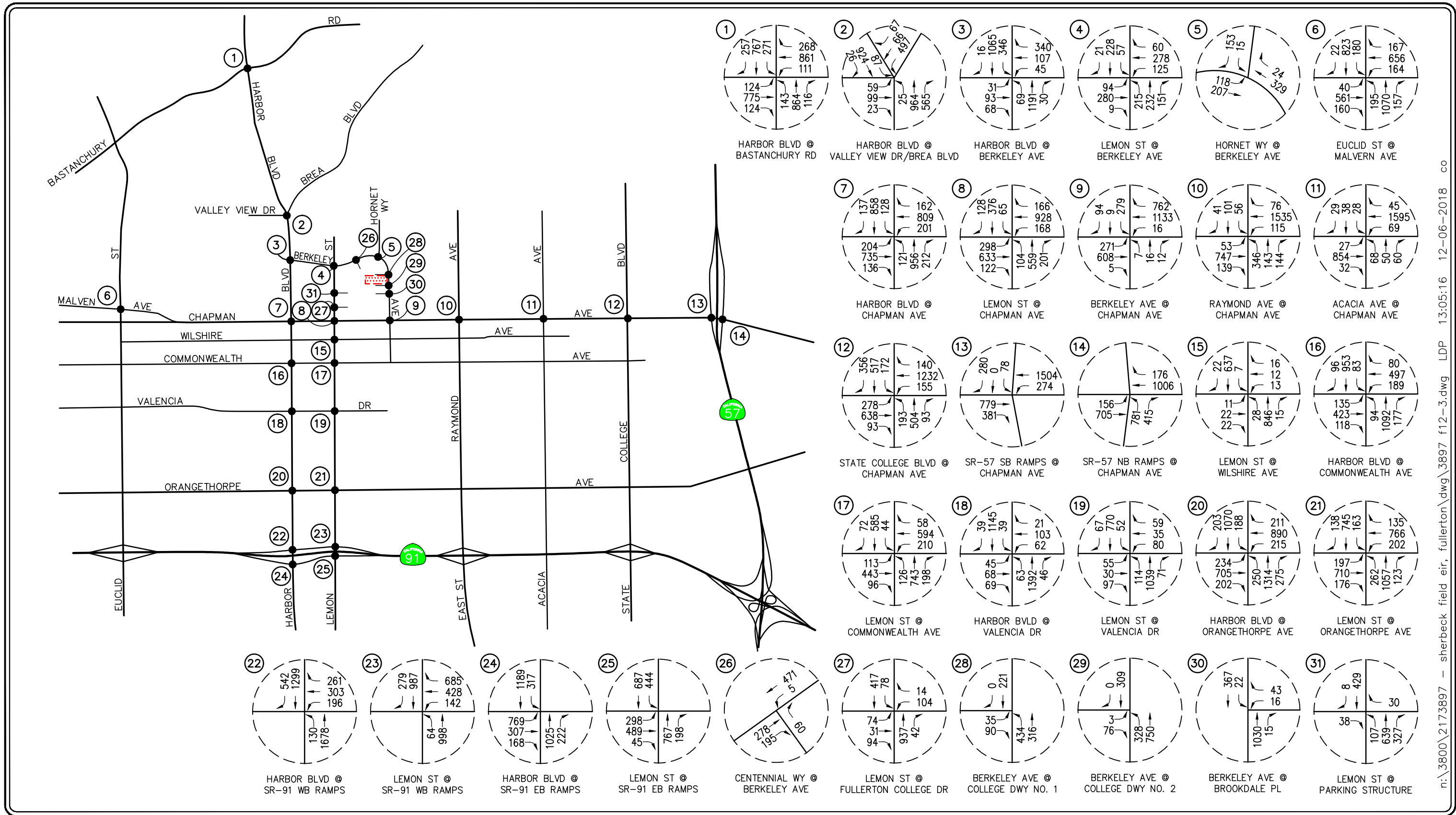
**KEY**

- # = STUDY INTERSECTION
- [Red hatched rectangle] = PROJECT SITE

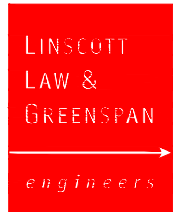
**FIGURE 12-2**

**EXISTING FRIDAY EVENT DEPARTURE PERIOD  
PEAK HOUR TRAFFIC VOLUMES**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



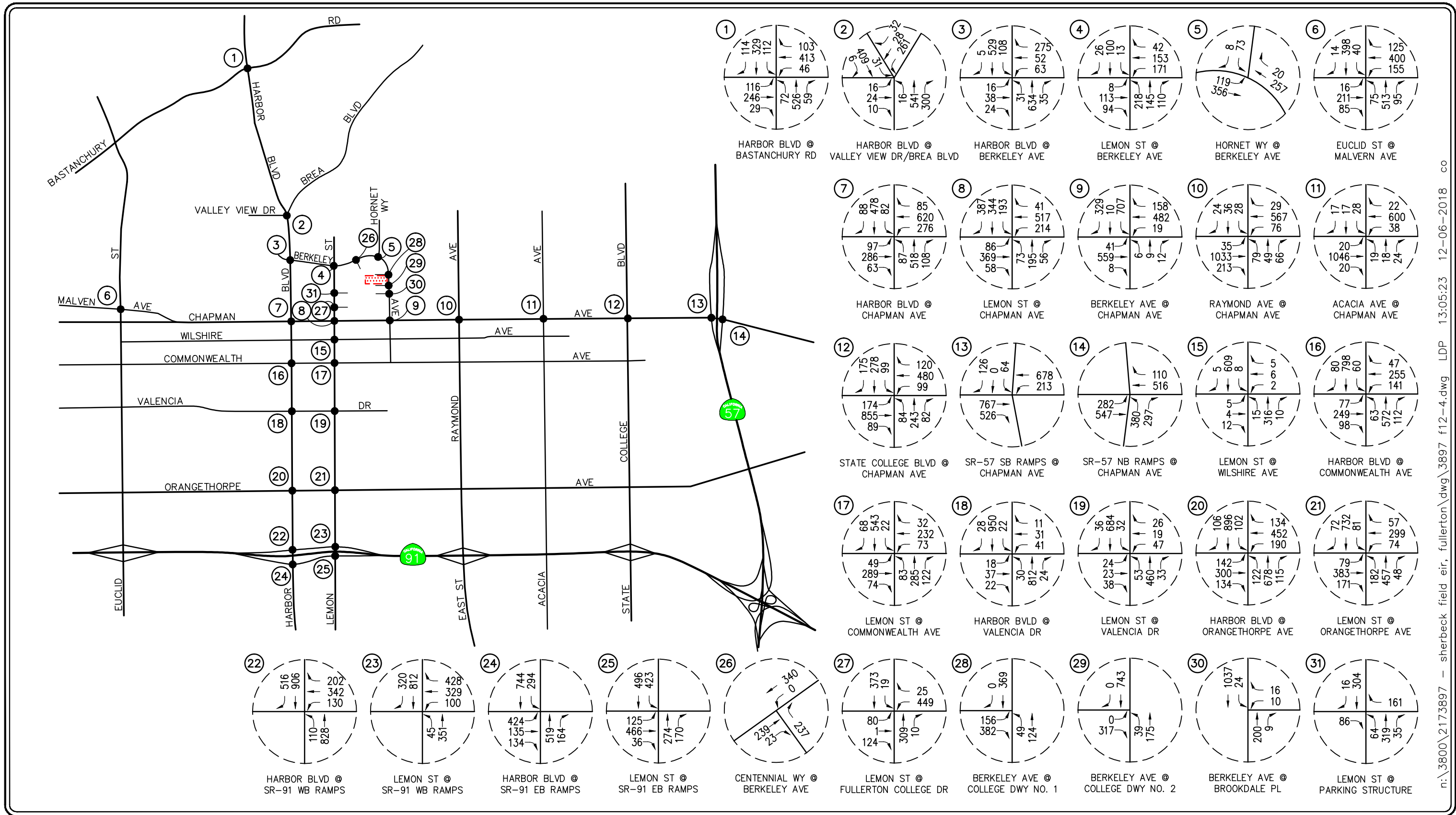
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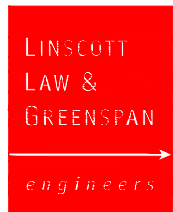
**KEY**  
 # = STUDY INTERSECTION  
 [Red Hatched Box] = PROJECT SITE

**FIGURE 12-3**  
**EXISTING PLUS PROJECT FRIDAY EVENT ARRIVAL PERIOD**  
**PEAK HOUR TRAFFIC VOLUMES**  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





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NO SCALE

**KEY**

- # = STUDY INTERSECTION
- [Red Hatched Box] = PROJECT SITE

**FIGURE 12-4**

**EXISTING PLUS PROJECT FRIDAY EVENT DEPARTURE PERIOD  
PEAK HOUR TRAFFIC VOLUMES**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON

## 12.4 Year 2020 Friday Traffic Volumes

The Year 2020 Friday cumulative traffic volumes were forecasted consistent with the forecasting methodology presented previously in Section 6.1. It should be noted that the weekday PM peak hour cumulative project traffic volumes were utilized for the Friday Event Arrival Period peak hour and Friday Event Departure Period peak hour to provide a conservative forecast.

**Figures 12-5 and 12-6** present the Friday Event Arrival and Friday Event Departure peak hour cumulative traffic volumes (existing traffic + ambient growth + cumulative projects) at the key study intersections for the Year 2020, respectively.

**Figures 12-7 and 12-8** illustrate the Year 2020 forecast Friday Event Arrival peak hour and Friday Event Departure peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project (i.e. field event), respectively.

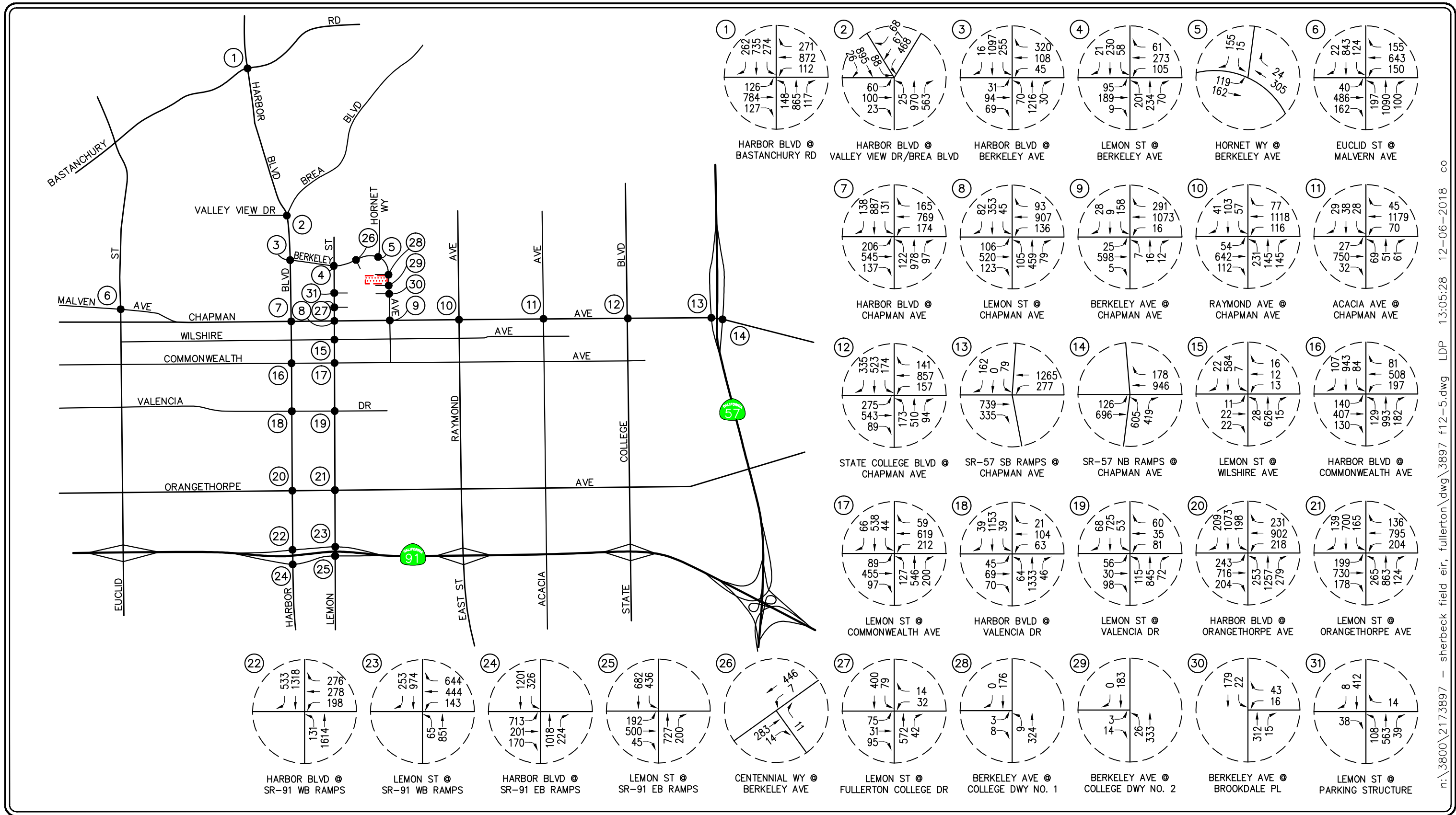
## 12.5 Peak Hour Intersection Capacity Analysis

### 12.5.1 Existing Plus Project Analysis – Friday Field Event

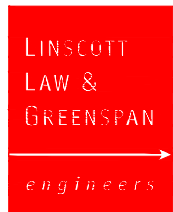
**Table 12-1** summarizes the Friday Event Arrival peak hour and Friday Event Departure peak hour Level of Service results at the thirty-one (31) key study intersections for Existing plus Project (i.e. field event) traffic conditions. The first column (1) of HCM/LOS values in **Table 12-1** presents a summary of existing Friday Event Arrival peak hour and Friday Event Departure peak hour traffic conditions. The second column (2) lists Existing plus Project (i.e. field event) traffic conditions. The third column (3) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fourth column (4) of **Table 12-1** indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

Review of Columns 2 and 3 of **Table 12-1** indicates that traffic associated with the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-seven (27) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the Friday Event Arrival peak hour and Friday Event Departure peak hour with the addition of Project generated traffic to existing traffic. The intersections operating at an adverse level of service under Existing plus Project Friday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Friday Arrival</u>		<u>Friday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	93.5 s/v	F
27. Lemon Street at Fullerton College Drive	---	---	541.9 s/v	F
28. Berkeley Avenue at College Driveway No. 1	---	---	44.5 s/v	E
29. Berkeley Avenue at College Driveway No. 2	---	---	56.7 s/v	F



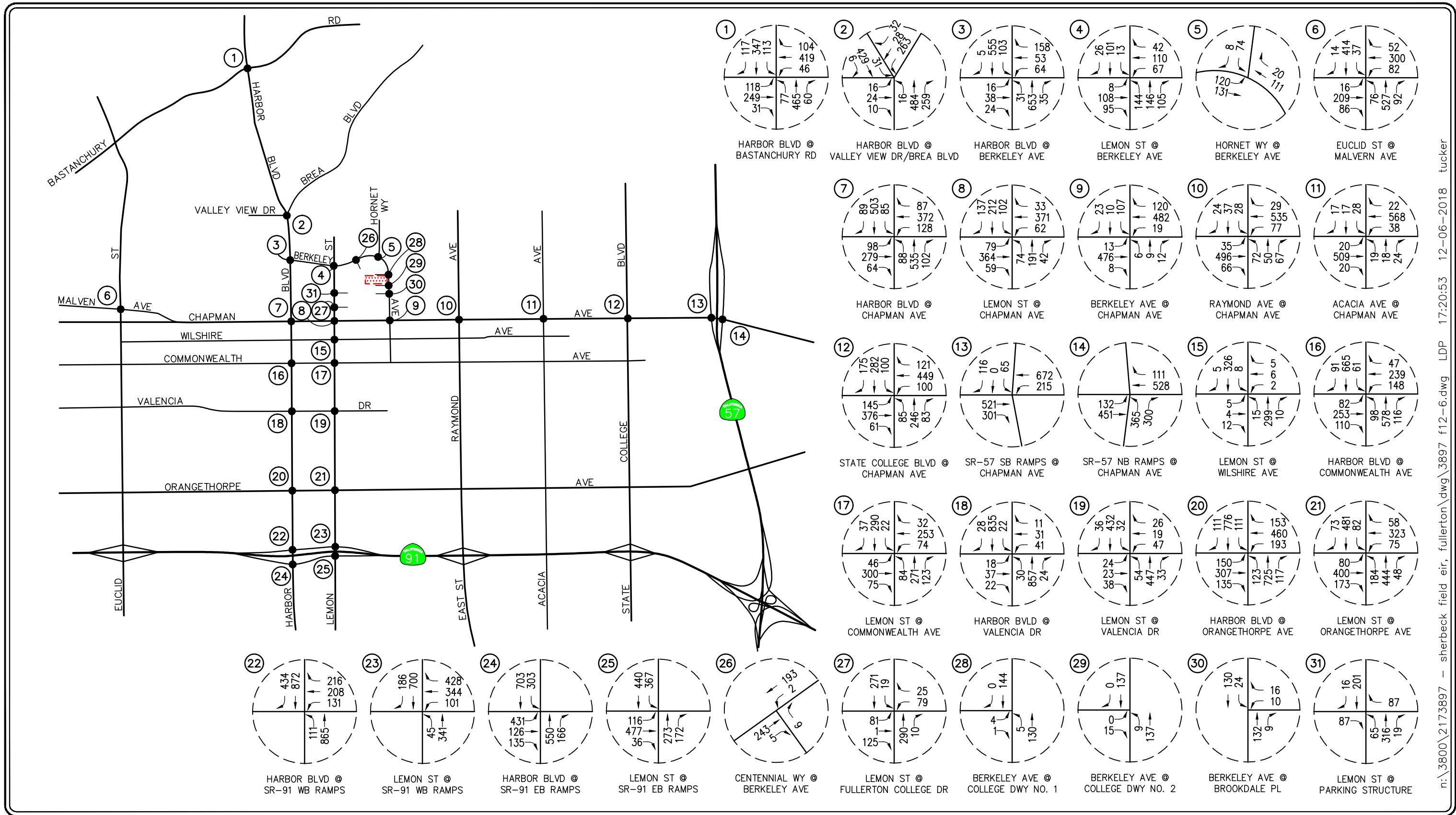
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**KEY**  
 # = STUDY INTERSECTION  
 [Hatched Box] = PROJECT SITE

**FIGURE 12-5**  
 YEAR 2020 FRIDAY EVENT ARRIVAL PERIOD  
 CUMULATIVE PEAK HOUR TRAFFIC VOLUMES  
 FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





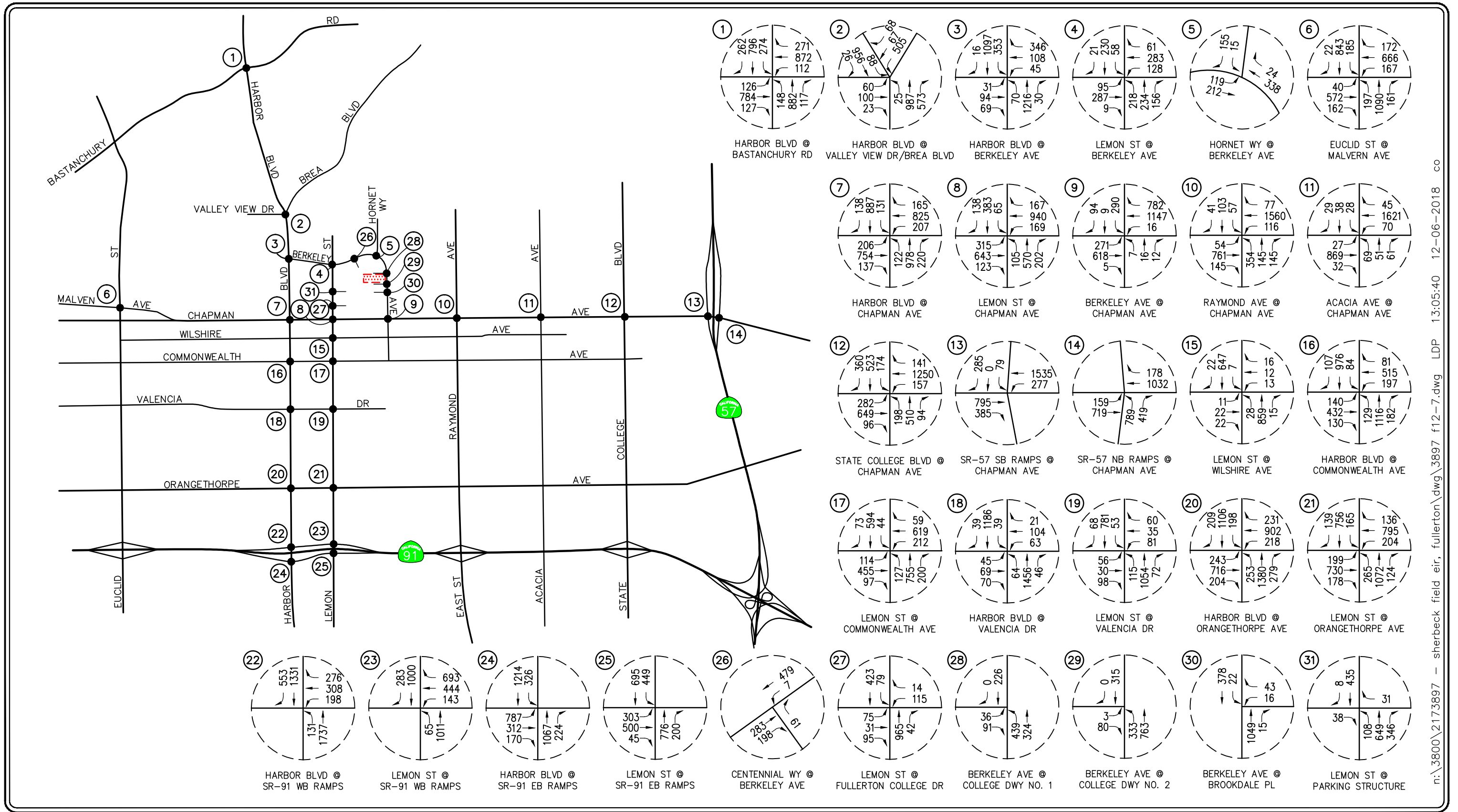
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- # = STUDY INTERSECTION
- [Red hatched box] = PROJECT SITE

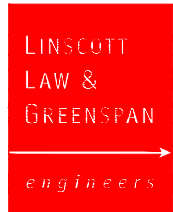
FIGURE 12-6

YEAR 2020 FRIDAY EVENT DEPARTURE PERIOD  
CUMULATIVE PEAK HOUR TRAFFIC VOLUMES

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON



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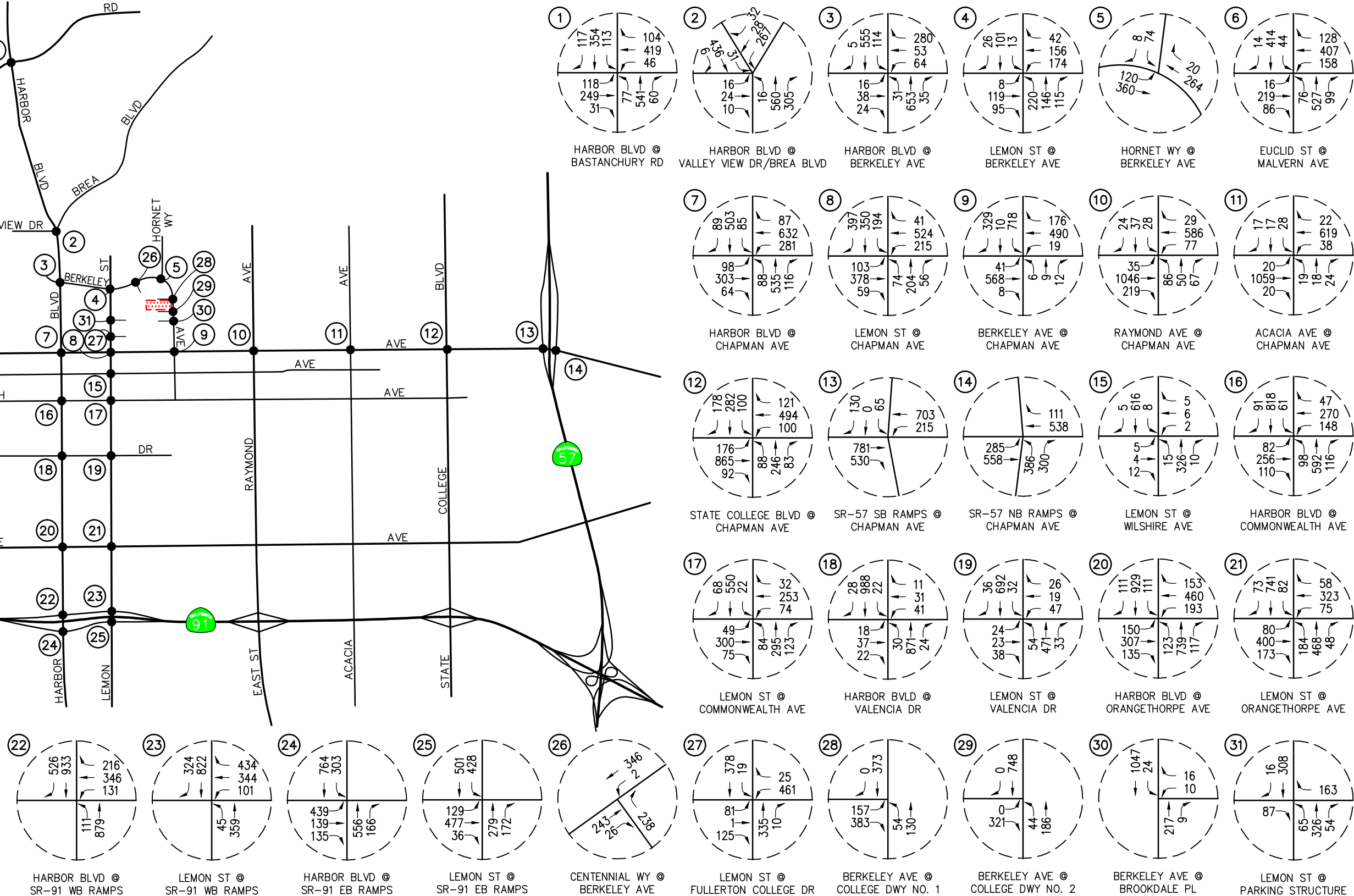
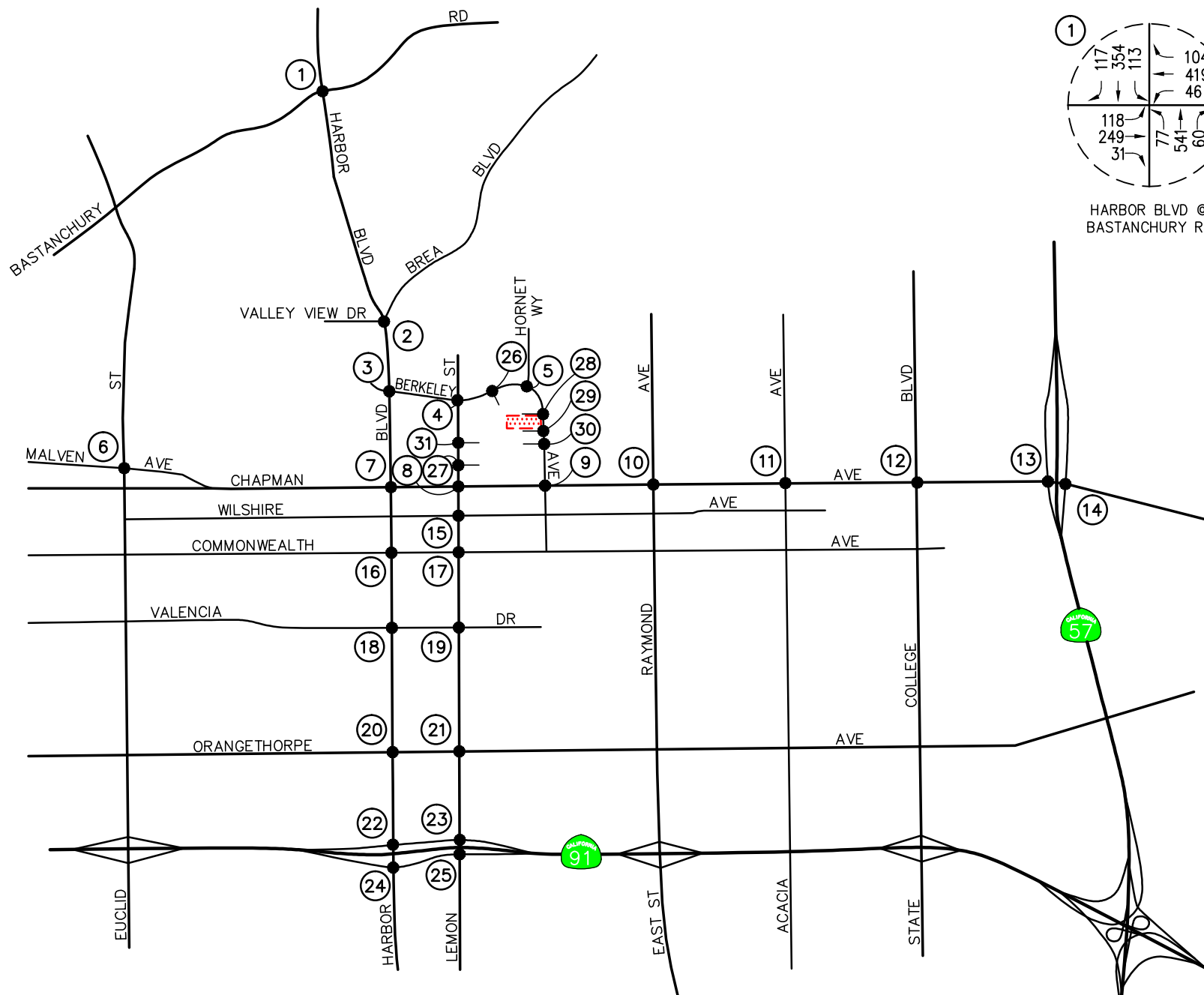
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**KEY**

- # = STUDY INTERSECTION
- [Red hatched box] = PROJECT SITE

**FIGURE 12-7**

**YEAR 2020 FRIDAY EVENT ARRIVAL PERIOD  
CUMULATIVE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES  
FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON**



As shown in column 4, the implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Lemon Street/Fullerton College Drive, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

*Appendix N* presents the Existing plus Project HCM/LOS Friday Event Arrival peak hour and Friday Event Departure peak hour calculations for the thirty-one (31) key study intersections.

### **12.5.2 Year 2020 Traffic Conditions – Friday Field Event**

*Table 12-2* summarizes the Friday Event Arrival peak hour and Friday Event Departure peak hour Level of Service results at the thirty-one (31) key study intersections for Year 2020 traffic conditions. The first column (1) of HCM/LOS values in *Table 12-2* presents a summary of existing Friday Event Arrival peak hour and Friday Event Departure peak hour traffic conditions. The second column (2) lists projected Year 2020 traffic conditions (existing plus ambient growth plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2020 traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in the HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) of *Table 12-2* indicates the anticipated operating conditions with implementation of improvements planned and/or recommended to mitigate Project traffic and/or achieve an acceptable Level of Service.

#### **12.5.2.1 Year 2020 Traffic Conditions (Without Project) – Friday Field Event**

An analysis of future (Year 2020) Friday cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative projects traffic will not adversely impact the thirty-one (31) key study intersections. The thirty-one (31) key study intersections are forecast to continue to operate at acceptable levels of service during the Friday Event Arrival peak hour and Friday Event Departure peak hour with the addition of ambient traffic growth and cumulative projects traffic.

#### **12.5.2.2 Year 2020 Plus Project Traffic Conditions – Friday Field Event**

Review of Columns 3 and 4 of *Table 12-2* indicates that traffic associated with the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-seven (27) key study intersections are forecast to continue to operate at an acceptable service level during the Friday Event Arrival peak hour and Friday Event Departure peak hour with the addition of Project generated traffic to Year 2020 cumulative traffic. The intersections operating at an adverse level of service under Year 2020 plus project Friday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Friday Arrival</u>		<u>Friday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	98.1 s/v	F
27. Lemon Street at Fullerton College Drive	---	---	554.2 s/v	F
28. Berkeley Avenue at College Driveway No. 1	---	---	46.8 s/v	E
29. Berkeley Avenue at College Driveway No. 2	---	---	60.2 s/v	F

As shown in column 5, the implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Lemon Street/Fullerton College Drive, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

**Appendix O** presents the Year 2020 plus Project HCM/LOS Friday Event Arrival peak hour and Friday Event Departure peak hour calculations for the thirty-one (31) key study intersections.

**TABLE 12-1**  
**EXISTING PLUS PROJECT FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Inc.	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Fri. Arrival Fri. Departure	37.4 s/v 31.2 s/v	D C	43.1 s/v 31.7 s/v	D D	5.7 s/v 0.5 s/v	No No	-- --	-- --
2. Harbor Boulevard at Valley View Dr/Brea Blvd	D	Fri. Arrival Fri. Departure	27.2 s/v 23.1 s/v	C C	27.7 s/v 22.4 s/v	C C	0.5 s/v 0.0 s/v	No No	-- --	-- --
3. Harbor Boulevard at Berkeley Avenue	D	Fri. Arrival Fri. Departure	22.9 s/v 17.5 s/v	C B	24.5 s/v 19.3 s/v	C B	1.6 s/v 1.8 s/v	No No	-- --	-- --
4. Lemon Street at Berkeley Avenue	D	Fri. Arrival Fri. Departure	49.9 s/v 31.8 s/v	D C	50.0 s/v <b>93.5 s/v</b>	D <b>F</b>	0.1 s/v <b>61.7 s/v</b>	No <b>Yes</b>	-- 15.2 s/v	-- B
5. Hornet Way at Berkeley Avenue	D	Fri. Arrival Fri. Departure	13.6 s/v 10.6 s/v	B B	12.8 s/v 7.3 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
6. Euclid Street at Malvern Avenue	D	Fri. Arrival Fri. Departure	30.4 s/v 25.1 s/v	C C	40.8 s/v 26.7 s/v	D C	10.4 s/v 1.6 s/v	No No	-- --	-- --
7. Harbor Boulevard at Chapman Avenue	E	Fri. Arrival Fri. Departure	29.2 s/v 25.2 s/v	C C	31.9 s/v 28.2 s/v	C C	2.7 s/v 3.0 s/v	No No	-- --	-- --
8. Lemon Street at Chapman Avenue	D	Fri. Arrival Fri. Departure	31.6 s/v 29.9 s/v	C C	34.9 s/v 30.6 s/v	C C	3.3 s/v 0.7 s/v	No No	-- --	-- --
9. Berkeley Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	11.0 s/v 10.8 s/v	B B	18.0 s/v 23.6 s/v	B C	7.0 s/v 12.8 s/v	No No	-- --	-- --
10. Raymond Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	22.0 s/v 14.2 s/v	C B	25.2 s/v 14.3 s/v	C B	3.2 s/v 0.1 s/v	No No	-- --	-- --
11. Acacia Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	14.5 s/v 7.6 s/v	B A	13.9 s/v 6.9 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
12. State College Blvd at Chapman Avenue	D	Fri. Arrival Fri. Departure	36.1 s/v 36.0 s/v	D D	50.3 s/v 36.0 s/v	D D	14.2 s/v 0.0 s/v	No No	-- --	-- --
13. SR-57 SB Ramps at Chapman Avenue	D	Fri. Arrival Fri. Departure	15.9 s/v 15.9 s/v	B B	24.0 s/v 16.8 s/v	C B	8.1 s/v 0.9 s/v	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Fri. Arrival Fri. Departure	26.6 s/v 25.4 s/v	C C	29.1 s/v 27.4 s/v	C C	2.5 s/v 2.0 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle



**TABLE 12-1 (CONTINUED)**  
**EXISTING PLUS PROJECT FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Inc.	Yes/No	HCM	LOS
15. Lemon Street at Wilshire Avenue	D	Fri. Arrival Fri. Departure	5.7 s/v 3.7 s/v	A A	5.1 s/v 3.1 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
16. Harbor Boulevard at Commonwealth Ave	E	Fri. Arrival Fri. Departure	30.6 s/v 30.1 s/v	C C	30.9 s/v 30.4 s/v	C C	0.3 s/v 0.3 s/v	No No	-- --	-- --
17. Lemon Street at Commonwealth Ave	D	Fri. Arrival Fri. Departure	32.7 s/v 31.9 s/v	C C	34.0 s/v 32.7 s/v	C C	1.3 s/v 0.8 s/v	No No	-- --	-- --
18. Harbor Boulevard at Valencia Drive	D	Fri. Arrival Fri. Departure	11.7 s/v 7.0 s/v	B A	11.7 s/v 6.7 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
19. Lemon Street at Valencia Drive	D	Fri. Arrival Fri. Departure	12.8 s/v 9.0 s/v	B A	12.4 s/v 7.9 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
20. Harbor Boulevard at Orangethorpe Avenue	E	Fri. Arrival Fri. Departure	38.9 s/v 36.1 s/v	D D	50.7 s/v 37.0 s/v	D D	11.8 s/v 0.9 s/v	No No	-- --	-- --
21. Lemon Street at Orangethorpe Avenue	D	Fri. Arrival Fri. Departure	36.3 s/v 30.9 s/v	D C	38.2 s/v 31.0 s/v	D C	1.9 s/v 0.1 s/v	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Fri. Arrival Fri. Departure	16.3 s/v 15.2 s/v	B B	16.3 s/v 16.2 s/v	B C	0.0 s/v 1.0 s/v	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Fri. Arrival Fri. Departure	24.6 s/v 21.7 s/v	C C	25.9 s/v 21.7 s/v	C C	1.3 s/v 0.0 s/v	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Fri. Arrival Fri. Departure	21.2 s/v 21.6 s/v	C C	22.2 s/v 21.8 s/v	C C	1.0 s/v 0.2 s/v	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Fri. Arrival Fri. Departure	24.8 s/v 26.9 s/v	C C	26.0 s/v 26.9 s/v	C C	1.2 s/v 0.0 s/v	No No	-- --	-- --
26. Centennial Way at Berkeley Avenue	D	Fri. Arrival Fri. Departure	10.1 s/v 10.2 s/v	B B	10.4 s/v 12.8 s/v	B B	0.3 s/v 2.6 s/v	No No	-- --	-- --
27. Lemon Street at Fullerton College Dr	D	Fri. Arrival Fri. Departure	12.7 s/v 26.6 s/v	B C	24.9 s/v <b>541.9 s/v</b>	C <b>F</b>	12.2 s/v <b>515.3 s/v</b>	No <b>Yes</b>	-- 18.4 s/v	-- B
28. Berkeley Avenue at College Dwy No. 1	D	Fri. Arrival Fri. Departure	9.9 s/v 10.0 s/v	A B	19.1 s/v <b>44.5 s/v</b>	C <b>E</b>	9.2 s/v <b>34.5 s/v</b>	No <b>Yes</b>	-- 15.5 s/v	-- B

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle

**TABLE 12-1 (CONTINUED)**  
**EXISTING PLUS PROJECT FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Existing Plus Project Traffic Conditions		(3)  Significant Impact		(4)  Existing Plus Project With Improvements	
			HCM	LOS	HCM	LOS	Inc.	Yes/No	HCM	LOS
29. Berkeley Avenue at College Dwy No. 2	D	Fri. Arrival Fri. Departure	10.1 s/v 9.5 s/v	B A	12.8 s/v <b>56.7 s/v</b>	B <b>F</b>	2.7 s/v <b>47.2 s/v</b>	No <b>Yes</b>	-- 13.3 s/v	-- B
30. Berkeley Avenue at Brookdale Place	D	Fri. Arrival Fri. Departure	11.5 s/v 9.8 s/v	B A	26.1 s/v 14.0 s/v	D B	14.6 s/v 4.2 s/v	No No	-- --	-- --
31. Lemon Street at Parking Structure	D	Fri. Arrival Fri. Departure	10.5 s/v 10.5 s/v	B B	12.7 s/v 11.5 s/v	B B	2.2 s/v 1.0 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- sec/veh = seconds per vehicle



**TABLE 12-2**  
**YEAR 2020 CUMULATIVE FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)		(2)		(3)		(4)		(5)	
			Existing Traffic Conditions		Year 2020 Cumulative Traffic Conditions		Year 2020 Cumulative Plus Project Traffic Conditions		Significant Impact		Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Harbor Boulevard at Bastanchury Road	D	Fri. Arrival Fri. Departure	37.4 s/v 31.2 s/v	D C	37.8 s/v 32.3 s/v	D C	38.0 s/v 34.1 s/v	D D	0.2 s/v 1.8 s/v	No No	-- --	-- --
2. Harbor Boulevard at Valley View Drive/Brea Blvd	D	Fri. Arrival Fri. Departure	27.2 s/v 23.1 s/v	C C	27.3 s/v 22.7 s/v	C C	27.8 s/v 22.1 s/v	C C	0.5 s/v 0.0 s/v	No No	-- --	-- --
3. Harbor Boulevard at Berkeley Avenue	D	Fri. Arrival Fri. Departure	22.9 s/v 17.5 s/v	C B	23.2 s/v 17.6 s/v	C B	24.8 s/v 19.3 s/v	C B	1.6 s/v 1.7 s/v	No No	-- --	-- --
4. Lemon Street at Berkeley Avenue	D	Fri. Arrival Fri. Departure	49.9 s/v 31.8 s/v	D C	51.1 s/v 32.1 s/v	D C	51.3 s/v <b>98.1 s/v</b>	D <b>F</b>	0.2 s/v <b>66.0 s/v</b>	No <b>Yes</b>	-- 15.5 s/v	-- B
5. Hornet Way at Berkeley Avenue	D	Fri. Arrival Fri. Departure	13.6 s/v 10.6 s/v	B B	13.6 s/v 10.5 s/v	B B	12.7 s/v 7.3 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
6. Euclid Street at Malvern Avenue	D	Fri. Arrival Fri. Departure	30.4 s/v 25.1 s/v	C C	30.9 s/v 25.2 s/v	C C	33.1 s/v 26.6 s/v	C C	2.2 s/v 1.4 s/v	No No	-- --	-- --
7. Harbor Boulevard at Chapman Avenue	E	Fri. Arrival Fri. Departure	29.2 s/v 25.2 s/v	C C	29.5 s/v 25.5 s/v	C C	32.5 s/v 28.3 s/v	C C	3.0 s/v 2.8 s/v	No No	-- --	-- --
8. Lemon Street at Chapman Avenue	D	Fri. Arrival Fri. Departure	31.6 s/v 29.9 s/v	C C	31.7 s/v 30.4 s/v	C C	35.2 s/v 30.6 s/v	D C	3.5 s/v 0.2 s/v	No No	-- --	-- --
9. Berkeley Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	11.0 s/v 10.8 s/v	B B	11.2 s/v 11.0 s/v	B B	15.0 s/v 23.5 s/v	B C	3.8 s/v 12.5 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 12-2 (CONTINUED)**  
**YEAR 2020 CUMULATIVE FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
10. Raymond Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	22.0 s/v 14.2 s/v	C B	22.2 s/v 14.3 s/v	C B	27.0 s/v 14.5 s/v	C B	4.8 s/v 0.2 s/v	No No	-- --	-- --
11. Acacia Avenue at Chapman Avenue	D	Fri. Arrival Fri. Departure	14.5 s/v 7.6 s/v	B A	14.5 s/v 7.6 s/v	B A	13.7 s/v 6.9 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
12. State College Boulevard at Chapman Avenue	D	Fri. Arrival Fri. Departure	36.1 s/v 36.0 s/v	D D	36.3 s/v 36.2 s/v	D D	45.4 s/v 37.1 s/v	D D	9.1 s/v 0.9 s/v	No No	-- --	-- --
13. SR-57 SB Ramps at Chapman Avenue	D	Fri. Arrival Fri. Departure	15.9 s/v 15.9 s/v	B B	16.0 s/v 15.9 s/v	B B	19.4 s/v 15.9 s/v	B B	3.4 s/v 0.0 s/v	No No	-- --	-- --
14. SR-57 NB Ramps at Chapman Avenue	D	Fri. Arrival Fri. Departure	26.6 s/v 25.4 s/v	C C	26.7 s/v 26.6 s/v	C C	29.3 s/v 27.4 s/v	C C	2.6 s/v 0.8 s/v	No No	-- --	-- --
15. Lemon Street at Wilshire Avenue	D	Fri. Arrival Fri. Departure	5.7 s/v 3.7 s/v	A A	5.6 s/v 3.7 s/v	A A	5.1 s/v 3.1 s/v	A A	0.0 s/v 0.0 s/v	No No	-- --	-- --
16. Harbor Boulevard at Commonwealth Avenue	E	Fri. Arrival Fri. Departure	30.6 s/v 30.1 s/v	C C	30.6 s/v 30.2 s/v	C C	31.7 s/v 33.5 s/v	C C	1.1 s/v 3.3 s/v	No No	-- --	-- --
17. Lemon Street at Commonwealth Avenue	D	Fri. Arrival Fri. Departure	32.7 s/v 31.9 s/v	C C	33.4 s/v 32.2 s/v	C C	34.5 s/v 36.6 s/v	C D	1.1 s/v 4.4 s/v	No No	-- --	-- --
18. Harbor Boulevard at Valencia Drive	D	Fri. Arrival Fri. Departure	11.7 s/v 7.0 s/v	B A	11.8 s/v 6.9 s/v	B A	11.8 s/v 6.6 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 12-2 (CONTINUED)**  
**YEAR 2020 CUMULATIVE FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
19. Lemon Street at Valencia Drive	D	Fri. Arrival Fri. Departure	12.8 s/v 9.0 s/v	B A	12.8 s/v 8.9 s/v	B A	12.4 s/v 7.8 s/v	B A	0.0 s/v 0.0 s/v	No No	-- --	-- --
20. Harbor Boulevard at Orangethorpe Avenue	E	Fri. Arrival Fri. Departure	38.9 s/v 36.1 s/v	D D	41.1 s/v 36.3 s/v	D D	47.9 s/v 36.9 s/v	D D	6.8 s/v 0.6 s/v	No No	-- --	-- --
21. Lemon Street at Orangethorpe Avenue	D	Fri. Arrival Fri. Departure	36.3 s/v 30.9 s/v	D C	39.0 s/v 32.8 s/v	D C	41.4 s/v 33.1 s/v	D C	2.4 s/v 0.3 s/v	No No	-- --	-- --
22. Harbor Boulevard at SR-91 WB Ramps	D	Fri. Arrival Fri. Departure	16.3 s/v 15.2 s/v	B B	16.7 s/v 15.2 s/v	B B	16.7 s/v 16.3 s/v	B B	0.0 s/v 1.1 s/v	No No	-- --	-- --
23. Lemon Street at SR-91 WB Ramps	D	Fri. Arrival Fri. Departure	24.6 s/v 21.7 s/v	C C	24.9 s/v 21.8 s/v	C C	26.3 s/v 22.0 s/v	C C	1.4 s/v 0.2 s/v	No No	-- --	-- --
24. Harbor Boulevard at SR-91 EB Ramps	D	Fri. Arrival Fri. Departure	21.2 s/v 21.6 s/v	C C	21.4 s/v 21.6 s/v	C C	22.4 s/v 21.8 s/v	C C	1.0 s/v 0.2 s/v	No No	-- --	-- --
25. Lemon Street at SR-91 EB Ramps	D	Fri. Arrival Fri. Departure	24.8 s/v 26.9 s/v	C C	25.0 s/v 27.0 s/v	C C	26.2 s/v 27.0 s/v	C C	1.2 s/v 0.0 s/v	No No	-- --	-- --
26. Centennial Way at Berkeley Avenue	D	Fri. Arrival Fri. Departure	10.1 s/v 10.2 s/v	B B	10.1 s/v 10.3 s/v	B B	10.5 s/v 12.9 s/v	B B	0.4 s/v 2.6 s/v	No No	-- --	-- --
27. Lemon Street at Fullerton College Drive	D	Fri. Arrival Fri. Departure	12.7 s/v 26.6 s/v	B C	12.9 s/v 31.8 s/v	B C	29.5 s/v <b>554.2 s/v</b>	C <b>F</b>	16.6 s/v <b>522.4 s/v</b>	No <b>Yes</b>	-- 18.5 s/v	-- B

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

**TABLE 12-2 (CONTINUED)**  
**YEAR 2020 CUMULATIVE FRIDAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS – FIELD EVENT**

Key Intersection	Min. Acc. LOS	Time Period	(1)  Existing Traffic Conditions		(2)  Year 2020 Cumulative Traffic Conditions		(3)  Year 2020 Cumulative Plus Project Traffic Conditions		(4)  Significant Impact		(5)  Year 2020 Cumulative Plus Project With Improvements	
			HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
28. Berkeley Avenue at College Driveway No. 1	D	Fri. Arrival Fri. Departure	9.9 s/v 10.0 s/v	A B	10.0 s/v 10.1 s/v	A B	19.8 s/v <b>46.8 s/v</b>	C E	9.8 s/v <b>36.7 s/v</b>	No Yes	-- 15.5 s/v	-- B
29. Berkeley Avenue at College Driveway No. 2	D	Fri. Arrival Fri. Departure	10.1 s/v 9.5 s/v	B A	10.2 s/v 9.6 s/v	B A	12.9 s/v <b>60.2 s/v</b>	B F	2.7 s/v <b>50.6 s/v</b>	No Yes	-- 13.4 s/v	-- B
30. Berkeley Avenue at Brookdale Place	D	Fri. Arrival Fri. Departure	11.5 s/v 9.8 s/v	B A	11.7 s/v 9.9 s/v	B A	27.0 s/v 14.2 s/v	D B	15.3 s/v 4.3 s/v	No No	-- --	-- --
31. Lemon Street at Parking Structure	D	Fri. Arrival Fri. Departure	10.5 s/v 10.5 s/v	B B	10.6 s/v 10.7 s/v	B B	12.9 s/v 11.8 s/v	B B	2.3 s/v 1.1 s/v	No No	-- --	-- --

Notes:

- **Bold HCM/LOS** values indicate adverse service levels
- s/v = seconds per vehicle

## 12.6 Existing Plus Project Friday Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 12-1* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Existing Plus Project Friday” traffic scenario. The following are improvements recommended to mitigate the Existing plus Project Friday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 27 – Lemon Street at Fullerton College Drive:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

**Figure 12-9** graphically illustrates the Existing plus Project Friday recommended improvements.

## 12.7 Year 2020 Plus Project Friday Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 12-2* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Friday” traffic scenario. The following are improvements recommended to mitigate the Year 2020 plus Project Friday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may

include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

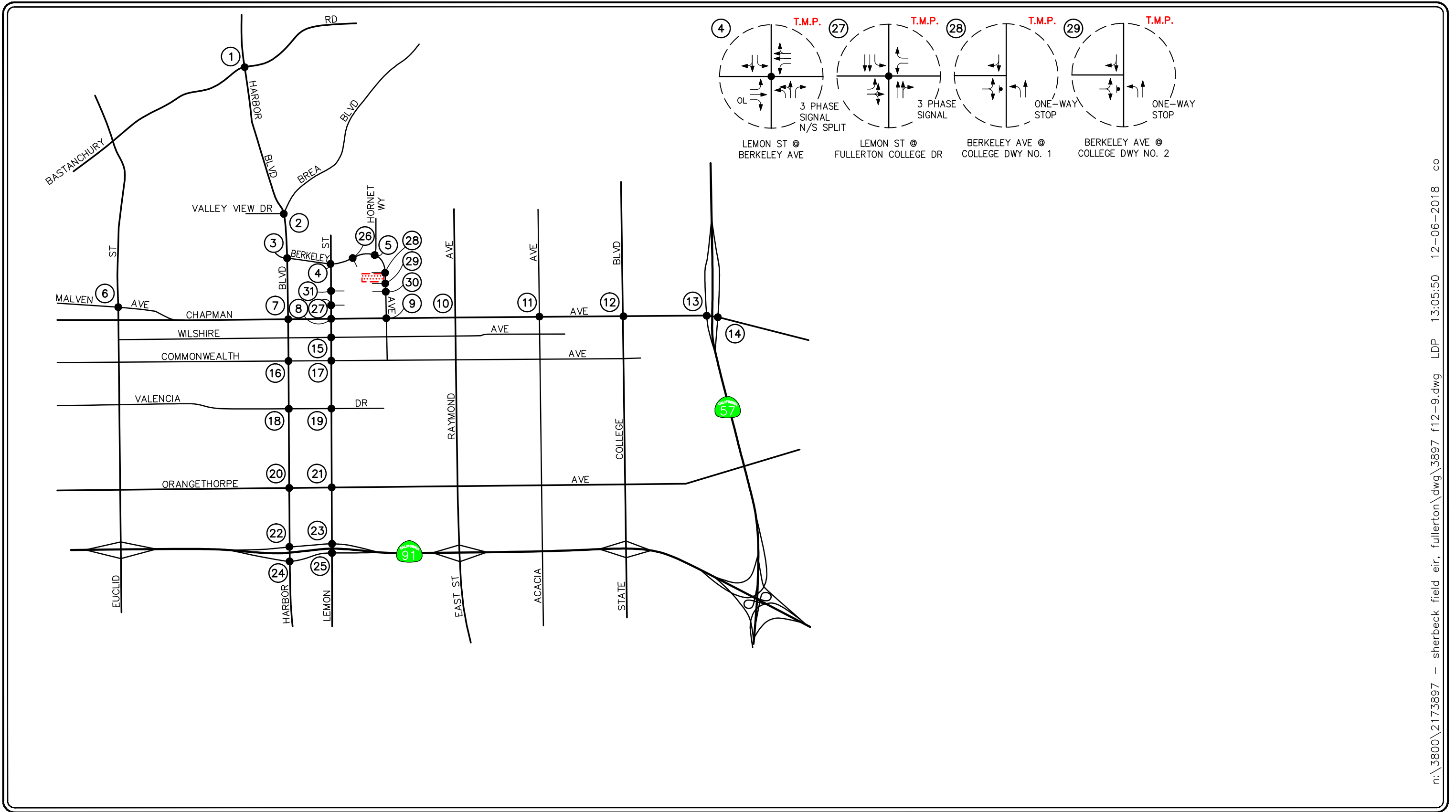
- **No. 27 – Lemon Street at Fullerton College Drive:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

*Figure 12-10* graphically illustrates the Year 2020 plus Project Friday recommended improvements.

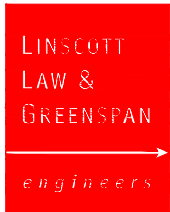
## 12.8 Traffic Management Plan

*Figure 12-11* presents the staffing component of the Traffic Management Plan (TMP) recommended during the Friday field event departure period for key study intersections #4, #27, #28 and #29. The figure identifies the potential location of police department staff that will be stationed at these locations to direct traffic flows. The project traffic movements are also shown for reference. As part of the TMP, police department staff will monitor traffic congestion at these four locations to help minimize any traffic queues along Berkeley Avenue and Lemon Street. Should any traffic congestion or queues occur on Berkeley Avenue and Lemon Street during the event departure period, police department staff controlling the intersections will direct traffic flows in a manner to reduce or minimize the traffic congestion and queues. For the intersections of Lemon Street/Berkeley Avenue and Lemon Street/Fullerton College Drive (i.e. key study intersections #4 and #27, respectively), and depending upon traffic conditions on a given day, other components of the event TMP available to assist police department staff that could be deployed include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators, and/or placement of programmable changeable message signs (PCMS). For the intersections of Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 (i.e. key study intersections #28 and #29, respectively), other TMP components to assist police department staff include routing of traffic via traffic cones/delineators and/or placement of PCMS.

As shown in *Tables 12-1* and *12-2*, with implementation of the TMP, the impacts at the key study intersections of Lemon Street/Berkeley Avenue, Lemon Street/Fullerton College Drive, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 (i.e. key study intersections #4, #27, #28 and #29, respectively) will be reduced to less than significant and these four (4) intersections will operate at an acceptable level of service under existing plus project and Year 2020 plus project traffic conditions. Refer to the “with improvements” columns of *Tables 12-1* and *12-2*, which illustrates the resulting levels of service with implementation of the TMP.



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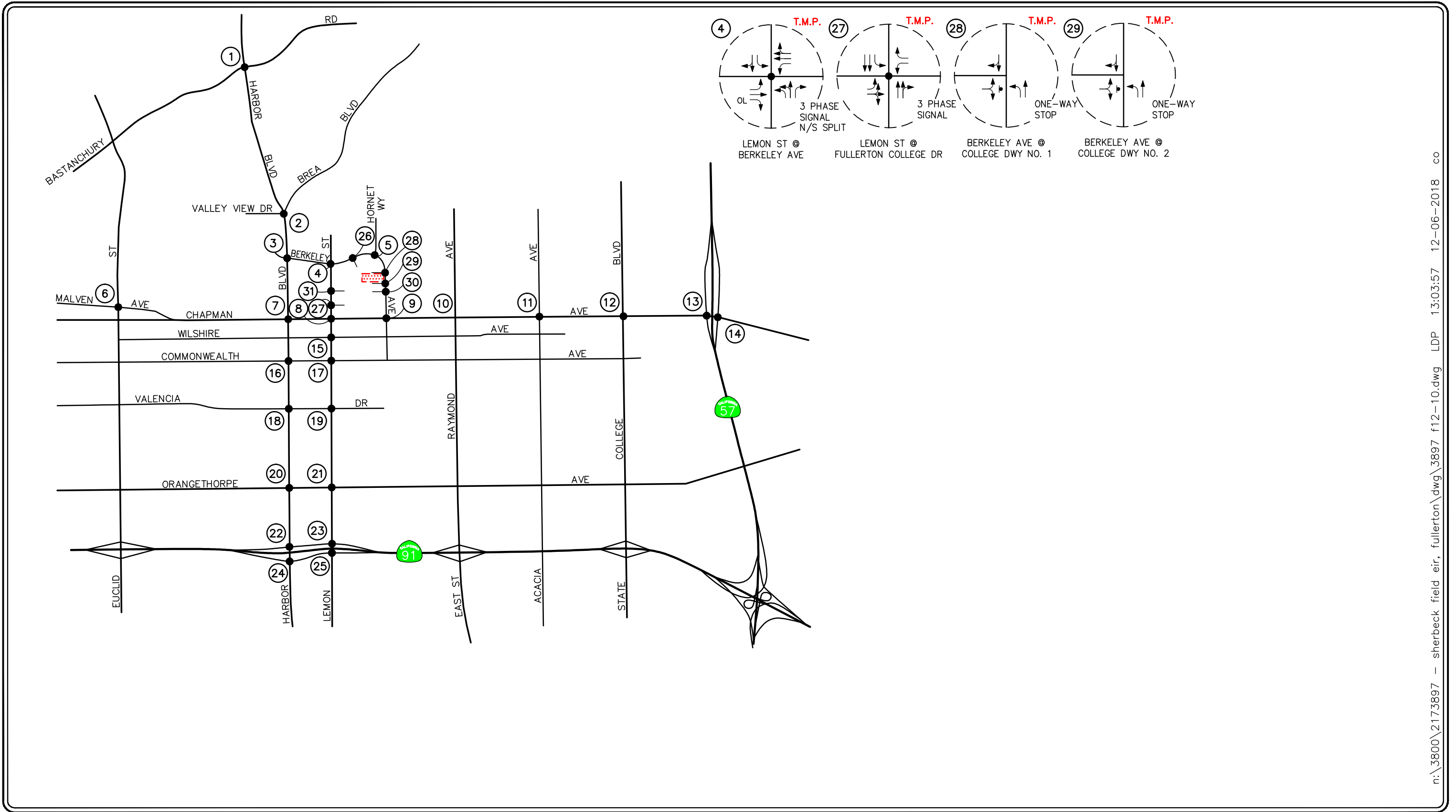
- KEY**
- ← = APPROACH LANE ASSIGNMENT
  - = TRAFFIC SIGNAL, ▼ = STOP SIGN
  - T.M.P. = TRAFFIC MANAGEMENT PLAN
  - [Red Hatched Box] = PROJECT SITE

**FIGURE 12-9**

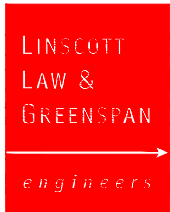
**EXISTING PLUS PROJECT FRIDAY  
RECOMMENDED IMPROVEMENTS**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON





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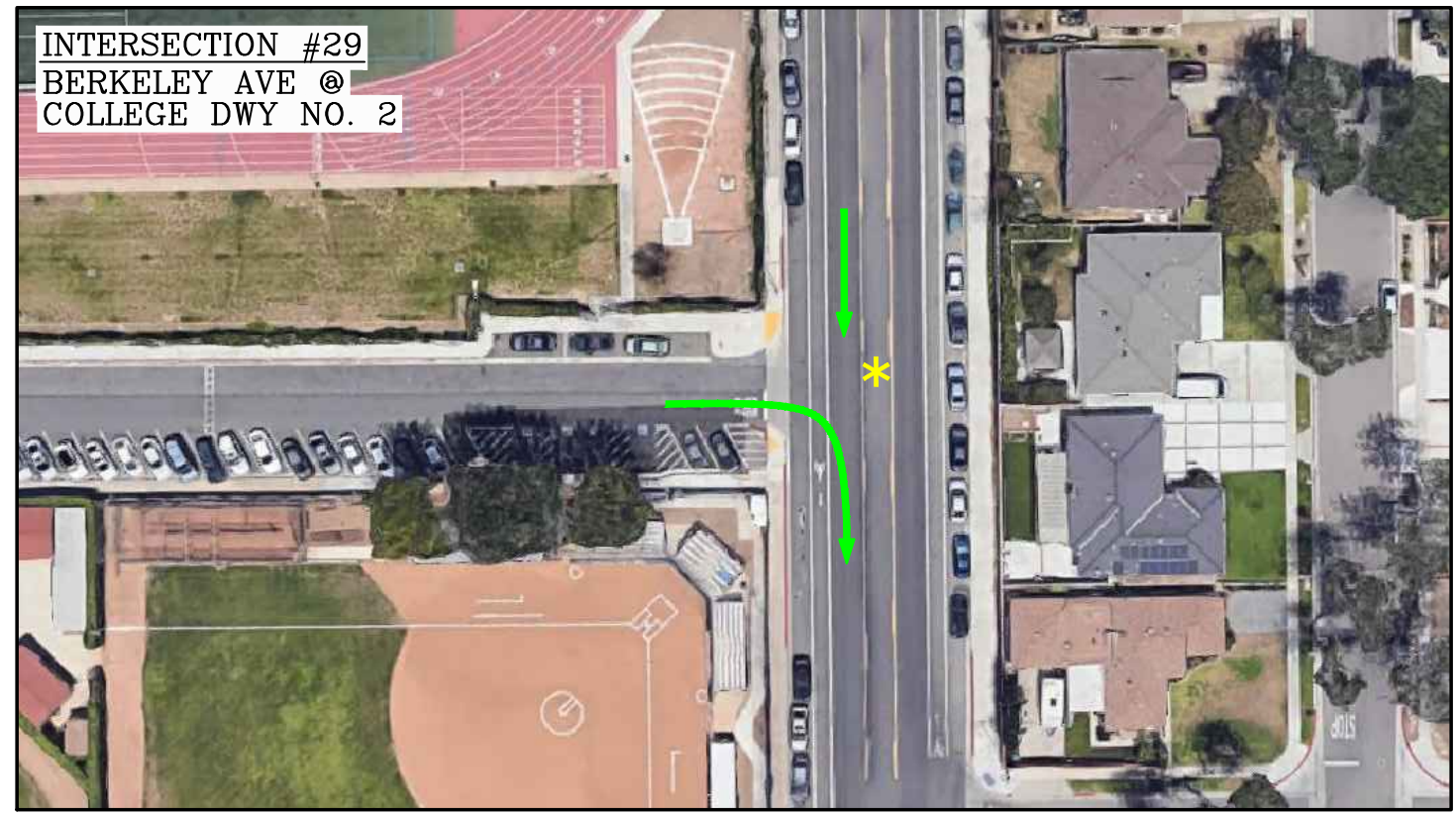
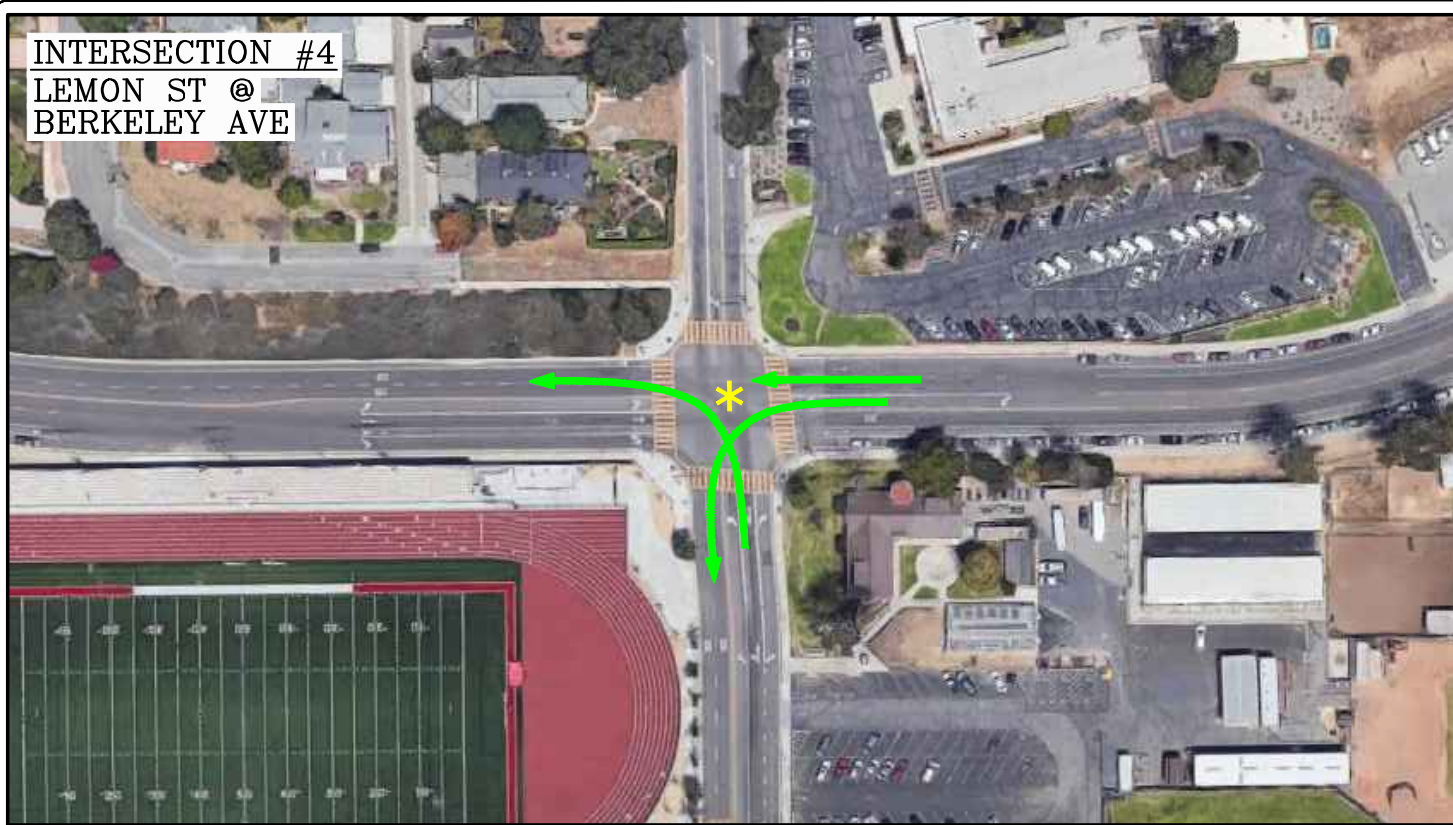
- KEY**
- ← = APPROACH LANE ASSIGNMENT
  - = TRAFFIC SIGNAL, ▼ = STOP SIGN
  - T.M.P. = TRAFFIC MANAGEMENT PLAN
  - [Hatched Box] = PROJECT SITE

**FIGURE 12-10**

**YEAR 2020 FRIDAY  
RECOMMENDED IMPROVEMENTS**

FULLERTON COLLEGE SHERBECK FIELD IMPROVEMENTS PROJECT, FULLERTON







## 13.0 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

This section of the report qualitatively evaluates the potential traffic impacts associated with the construction activities at the project site. The construction activities include 1) Site Preparation, 2) Trenching, 3) Building Construction, 4) Paving and 5) Architectural Coating. The following section describes the potential construction related trips associated with each construction activity and provides a qualitative assessment as to whether or not the forecast construction trips will have an impact on the existing street system.

### 13.1 Construction Traffic Trip Generation

In order to forecast the potential construction related trips associated with the construction activities at the project site, the following assumptions, as provided by the environmental consultant, have been utilized for the five aforementioned construction components.

#### **Site Preparation**

- A five-day work week (Monday through Friday from 7:00 AM to 5:00 PM) was assumed.
- The site preparation construction component is anticipated to last approximately one week.
- A total of nine (9) workers will be on site Monday through Friday from 7:00 AM to 5:00 PM.

#### **Trenching**

- A five-day work week (Monday through Friday from 7:00 AM to 5:00 PM) was assumed.
- The trenching construction component is anticipated to last approximately one month.
- A total of four (4) workers will be on site Monday through Friday from 7:00 AM to 5:00 PM.

#### **Building Construction**

- A five-day work week (Monday through Friday from 7:00 AM to 5:00 PM) was assumed.
- The building construction component is anticipated to last approximately 3.5 months.
- Sixteen (16) vendor trucks will visit the site per day as part of this construction component.
- A total of forty (40) workers will be on site Monday through Friday from 7:00 AM to 5:00 PM.

#### **Paving**

- A five-day work week (Monday through Friday from 7:00 AM to 5:00 PM) was assumed.
- The paving construction component is anticipated to last approximately two weeks.
- A total of eight (8) workers will be on site Monday through Friday from 7:00 AM to 5:00 PM.

#### **Architectural Coating**

- A five-day work week (Monday through Friday from 7:00 AM to 5:00 PM) was assumed.
- The architectural coating construction component is anticipated to last approximately one week.
- A total of ten (10) workers will be on site Monday through Friday from 7:00 AM to 5:00 PM.

In addition to the aforementioned assumptions for each construction component, the following assumptions were utilized for vendor truck trips and worker trips.

- Each vendor truck requires an inbound trip and an outbound trip.

- The daily number of vendor truck trips was averaged over the ten-hour workday to obtain the number of peak hour vendor truck trips (50% entering and 50% exiting).
- All vendor truck trips were converted to passenger car equivalents (P.C.E.'s) using a P.C.E. factor of 2.5.
- Each worker would make two (2) trips per day (one arrival before the AM peak hour and one departure during the PM peak hour).

Using the aforementioned assumptions, *Table 13-1* provides a summary of the forecast construction peak hour and daily traffic volumes for each of the five construction components. Review of the first row of *Table 13-1* shows that the site preparation construction component is expected to generate 18 daily trips, with 0 trips produced during the AM peak hour and 9 trips produced during the PM peak hour. Review of the second row of *Table 13-1* shows that the trenching construction component is expected to generate 8 daily trips, with 0 trips produced during the AM peak hour and 4 trips produced during the PM peak hour. Review of the third row of *Table 13-1* shows that the building construction component is expected to generate 160 daily trips, with 10 trips produced during the AM peak hour and 50 trips produced during the PM peak hour. Review of the fourth row of *Table 13-1* shows that the paving construction component is expected to generate 16 daily trips, with 0 trips produced during the AM peak hour and 8 trips produced during the PM peak hour. Review of the last row of *Table 13-1* shows that the architectural coating construction component is expected to generate 20 daily trips, with 0 trips produced during the AM peak hour and 10 trips produced during the PM peak hour.

### 13.2 Construction Traffic Assessment

Construction-related trips associated with trucks and workers traveling to and from the site in the morning and afternoon may result in some minor traffic delays; however, potential traffic interference caused by construction vehicles would create a temporary/short-term impact to vehicles using Berkeley Avenue and Chapman Avenue in the morning and afternoon hours and the number of construction workers will vary depending on the specific construction activities over time.

Traffic impacts to the adjacent roadway network will be minimal and **not** long-term. Further, since the construction-related trip generation potential of the proposed Project (i.e. all five construction components) is less than that of the proposed Project (i.e. weekday academic instruction) and the proposed Project (i.e. weekday academic instruction) is not expected to significantly impact any of the key study intersections, no significant impacts resulting from construction traffic are anticipated aside from the nuisance traffic that will occur as a result of construction-related traffic (e.g., construction materials, construction workers, etc.).

Nevertheless, to reduce the impact of construction-related traffic, the implementation of a Construction Management Plan is recommended to minimize traffic impacts upon the local circulation system in the area.

### 13.3 Construction Management Plan Criteria

To ensure impacts to the surrounding street system are kept a minimum, it is recommended that a Construction Management Plan for the proposed Project be developed. The Construction Management Plan should be developed in coordination with the City of Fullerton and at a minimum, address the following:

- Traffic control for any street closure, detour, or other disruption to traffic circulation.
- Identify the routes that construction vehicles will utilize for the delivery of construction materials to access the site, traffic controls and detours, and proposed construction phasing plan for the project.
- Specify the hours during which transport activities can occur and methods to mitigate construction-related impacts to adjacent streets.
- Require the Applicant to keep all haul routes clean and free of debris including but not limited to gravel and dirt as a result of its operations. The Applicant shall clean adjacent streets, as directed by the City Engineer (or representative of the City Engineer), of any material which may have been spilled, tracked, or blown onto adjacent streets or areas.
- Hauling or transport of oversize loads will be allowed between the hours of 7:00 AM and 5:00 PM only, Monday through Friday, unless approved otherwise by the City Engineer. No hauling or transport will be allowed during nighttime hours, weekends, or federal holidays.
- Use of local streets shall be prohibited.
- Haul trucks entering or exiting public streets shall at all times yield to public traffic.
- All construction-related parking and staging of vehicles will be kept out of the adjacent public roadways and will occur on-site.
- This Construction Management Plan shall meet standards established in the current *California Manual on Uniform Traffic Control Device (MUTCD)* as well as City of Fullerton requirements.

**TABLE 13-1**  
**PROJECT CONSTRUCTION-RELATED TRAFFIC GENERATION FORECAST**

Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<b><u>Site Preparation Generation Forecast:</u></b>							
• Workers (9 Workers)	<u>18</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>9</u>	<u>9</u>
<b>Total Site Preparation Construction Related Traffic Trip Generation Potential</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>
<b><u>Trenching Generation Forecast:</u></b>							
• Workers (4 Workers)	<u>8</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>4</u>
<b>Total Trenching Construction Related Traffic Trip Generation Potential</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b><u>Building Construction Generation Forecast:</u></b>							
• Vendor Truck Traffic (16 Trucks/Day)	32	2	2	4	2	2	4
<i>Passenger Car Equivalent<sup>34</sup></i>	80	5	5	10	5	5	10
• Workers (40 Workers)	<u>80</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>40</u>	<u>40</u>
<b>Total Building Construction Related Traffic Trip Generation Potential</b>	<b>160</b>	<b>5</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>45</b>	<b>50</b>
<b><u>Paving Generation Forecast:</u></b>							
• Workers (8 Workers)	<u>16</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>8</u>	<u>8</u>
<b>Total Paving Related Traffic Trip Generation Potential</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>
<b><u>Architectural Coating Generation Forecast:</u></b>							
• Workers (10 Workers)	<u>20</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>10</u>	<u>10</u>
<b>Total Architectural Coating Construction Related Traffic Trip Generation Potential</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>

<sup>34</sup> A passenger car equivalent factor of 2.5 was applied to the truck trips to convert them into passenger car trips.

## 14.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- **Project Description** – The Fullerton College Campus is an approximately 70-acre site that is generally bounded by residential uses along Berkeley Avenue to the north and east, Chapman Avenue to the south, Lemon Street to the west, and has an address of 321 E. Chapman Avenue, in the City of Fullerton, California. Specifically, Sherbeck Field (i.e. the proposed Project site) is located in the northeastern portion of the Fullerton College Campus. Sherbeck Field is 4.36 acres and consists of a turf football field that is surrounded by a 400-meter-long track. A two-story field house is located on the western edge of the field and there is a scoreboard located at the eastern end of the field. Sherbeck Field currently does not have permanent seating or lighting. Sherbeck Field is currently used for academic instruction, competitive athletics, and rentals.

The proposed Project will consist of the installation of permanent prefabricated aluminum bleachers with 4,417 seats (i.e. 2,861 seats on the home side of the field and 1,556 seats on the visitor side of the field), six field lighting stanchions to allow for more evening class options for the physical education program, a sound system, a press box and a storage building. The proposed field improvements will also allow Fullerton College home football games to occur on campus between 1:00 PM and 4:00 PM on Saturdays. The proposed Project is expected to be completed by the Year 2020.

Vehicular access to the parking lots adjacent to Sherbeck Field (i.e. student parking lots 4, 5 and 6) would continue to be provided from the existing unsignalized driveways located along Berkeley Avenue [i.e. Centennial Way/Berkeley Avenue (key study intersection #26), Berkeley Avenue/College Driveway No. 1 (key study intersection #28) and Berkeley Avenue/College Driveway No. 2 (key study intersection #29)]. It should be noted that key study intersection #29 (i.e. Berkeley Avenue/College Driveway No. 2) was assumed to only provide egress movements from the campus in the Year 2030, consistent with the Fullerton College Master Plan Traffic Study.

- **Study Scope** – The following thirty-one (31) key study locations were selected for detailed peak hour level of service analyses (i.e. Weekday PM peak hour, Saturday Event Arrival peak hour and Saturday Event Departure peak hour) under Existing Traffic Conditions, Existing Plus Project Traffic Conditions, Year 2020 Cumulative Traffic Conditions, Year 2020 Cumulative Plus Project Traffic Conditions, Year 2030 Buildout Traffic Conditions and Year 2030 Buildout Plus Project Traffic Conditions.

### Key Study Intersections

- |  |   |
|--|---|
| 1. Harbor Boulevard at Bastanchury Road    | 17. Lemon Street at Commonwealth Avenue                   |
| 2. Harbor Blvd at Valley View Dr/Brea Blvd | 18. Harbor Boulevard at Valencia Drive                    |
| 3. Harbor Boulevard at Berkeley Avenue     | 19. Lemon Street at Valencia Drive                        |
| 4. Lemon Street at Berkeley Avenue         | 20. Harbor Boulevard at Orangethorpe Avenue <sup>35</sup> |
| 5. Hornet Way at Berkeley Avenue           | 21. Lemon Street at Orangethorpe Avenue                   |
| 6. Euclid Street at Malvern Avenue         | 22. Harbor Boulevard at SR-91 WB Ramps <sup>7</sup>       |

<sup>35</sup> Orange County Congestion Management Program (CMP) intersection.

- |   |  |
|---|--|
| 7. Harbor Boulevard at Chapman Avenue         | 23. Lemon Street at SR-91 WB Ramps                   |
| 8. Lemon Street at Chapman Avenue             | 24. Harbor Boulevard at SR-91 EB Ramps <sup>36</sup> |
| 9. Berkeley Avenue at Chapman Avenue          | 25. Lemon Street at SR-91 EB Ramps                   |
| 10. Raymond Avenue at Chapman Avenue          | 26. Centennial Way at Berkeley Avenue                |
| 11. Acacia Avenue at Chapman Avenue           | 27. Lemon Street at Fullerton College Drive          |
| 12. State College Boulevard at Chapman Avenue | 28. Berkeley Avenue at College Driveway No. 1        |
| 13. SR-57 SB Ramps at Chapman Avenue          | 29. Berkeley Avenue at College Driveway No. 2        |
| 14. SR-57 NB Ramps at Chapman Avenue          | 30. Berkeley Avenue at Brookdale Place               |
| 15. Lemon Street at Wilshire Avenue           | 31. Lemon Street at Parking Structure                |
| 16. Harbor Boulevard at Commonwealth Avenue   |  |

- **Existing Traffic Conditions** – Thirty (30) of the thirty-one (31) key study intersections currently operate at an acceptable service level during the PM peak hour. The intersection of Harbor Boulevard at Bastanchury Road (i.e. key study intersection #1) currently operates at LOS during the PM peak hour. All thirty-one (31) key study intersections currently operate at an acceptable service level during the Saturday Event Arrival and Event Departure peak hours.
- **Project Trip Generation** – The proposed Project (i.e. academic instruction) is forecast to generate 528 weekday daily trips and 66 weekday PM peak hour trips (66 inbound and 0 outbound). The proposed Project (i.e. field event with 4,417 occupied seats) is forecast to generate 4,307 Saturday daily trips, 1,559 Saturday Event Arrival peak hour trips (1,228 inbound and 331 outbound) and 1,669 Saturday Event Departure peak hour trips (141 inbound and 1,528 outbound).
- **Year 2020 Traffic Characteristics** – In order to develop forecasts for the Year 2020, existing (Year 2017) traffic volumes were increased by a total ambient growth factor of 1.5% (0.5% per year). The City of Fullerton provided volumes for all cumulative projects related to Year 2020 traffic conditions. It should be noted that a portion of the Fullerton College Master Plan student growth (i.e. 638 students out of 3,189 students) was also included as a cumulative project in the Year 2020.
- **Year 2030 Buildout Traffic Characteristics** – Year 2030 peak hour background traffic volumes were forecast based on application of growth rates provided by the City of Fullerton to existing traffic volumes, and by further adding traffic volumes from all future cumulative projects (i.e. buildout of the City). A 10% total growth was applied to existing traffic volumes at key study intersections for all major through movements, and for any major turn movements, as identified by City of Fullerton staff. A 5% total growth was applied to existing traffic volumes for all of the remaining key intersection movements, which are considered to be minor movements. The City of Fullerton provided volumes for all cumulative projects related to Year 2030 traffic conditions. It should be noted that the Fullerton College Master Plan student growth (i.e. 3,189 students) was also included as a cumulative project in the Year 2030.

<sup>36</sup> Orange County Congestion Management Program (CMP) intersection.



- **Existing Plus Project Traffic Conditions (Weekday Academic Instruction)** – The proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Bastanchury Road is forecast to operate at unacceptable LOS E during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining thirty (30) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the weekday PM peak hour with the addition of Project generated traffic to existing traffic.
- **Existing Plus Project Traffic Conditions (Saturday Field Event)** – The proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-eight (28) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of Project generated traffic to existing traffic. The intersections operating at an adverse level of service under existing plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	72.4 s/v	E
28. Berkeley Avenue at College Driveway No. 1	---	---	72.2 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	85.4 s/v	F

The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

- **Year 2020 Plus Project Traffic Conditions (Weekday Academic Instruction)** – The proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Bastanchury Road is forecast to operate at unacceptable LOS E during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining thirty (30) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2020 traffic conditions.
- **Year 2020 Plus Project Traffic Conditions (Saturday Field Event)** – The proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The

remaining twenty-eight (28) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2020 traffic conditions. The intersections operating at an adverse level of service under Year 2020 plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	73.6 s/v	E
28. Berkeley Avenue at College Driveway No. 1	---	---	76.1 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	89.8 s/v	F

The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

- Year 2030 Buildout Plus Project Traffic Conditions (Weekday Academic Instruction)** – The proposed Project (i.e. academic instruction) ***will not*** significantly impact any of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersections of Harbor Boulevard/Bastanchury Road, Harbor Boulevard/Berkeley Avenue, Euclid Street/Malvern Avenue, Harbor Boulevard/Chapman Avenue, Lemon Street/Chapman Avenue, Raymond Avenue/Chapman Avenue, State College Boulevard/Chapman Avenue, SR-57 NB Ramps/Chapman Avenue, Harbor Boulevard/Valencia Drive, Harbor Boulevard/Orangethorpe Avenue and Lemon Street/Orangethorpe are forecast to operate at unacceptable LOS E or LOS F during the PM peak hour without and with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining twenty (20) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2030 Buildout traffic conditions.
- Year 2030 Buildout Plus Project Traffic Conditions (Saturday Field Event)** – The proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Harbor Boulevard/Orangethorpe Avenue is forecast to operate at unacceptable LOS F during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of project traffic, the addition of Project trips is not anticipated to worsen or further degrade the service level and therefore is considered less than significant based on the LOS standards and impact criteria detailed in **Section 7.1**. The remaining twenty-six (26) key study intersections are forecast to continue to operate at an acceptable LOS with the addition of Project generated traffic under Year 2030 Buildout traffic conditions. The intersections operating at an adverse level of service under Year 2030 Buildout plus project Saturday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Saturday Arrival</u>		<u>Saturday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	72.9 s/v	E
12. State College Boulevard at Chapman Avenue	66.4 s/v	E	89.4 s/v	F
28. Berkeley Avenue at College Driveway No. 1	124.2 s/v	F	114.1 s/v	F
29. Berkeley Avenue at College Driveway No. 2	---	---	113.6 s/v	F

The implementation of improvements at the impacted key study intersection of State College Boulevard/Chapman Avenue completely offsets the impact of project traffic. The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

- ***State of California (Caltrans) Methodology (Weekday Academic Instruction)*** – The results of the Existing Plus Project Weekday and Year 2020 Plus Project Weekday traffic analyses using the State of California (Caltrans) Methodology indicates that the proposed Project ***will not*** significantly impact the six (6) state-controlled study intersections. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the weekday PM peak hour with the addition of Project generated traffic to existing traffic and Year 2020 traffic.

The results of the Year 2030 Plus Project Weekday traffic analysis using the State of California (Caltrans) Methodology indicates that the proposed Project (i.e. academic instruction) will cumulatively impact one of the six (6) state-controlled study intersections, when compared to the LOS standards specified in this report. The remaining five state-controlled study intersections are forecast to continue to operate at acceptable LOS D or better with the addition of project generated traffic in the Year 2030. The implementation of improvements at the impacted state-controlled intersection of the SR-57 NB Ramps/Chapman Avenue completely offsets the impact of the proposed project. The impacted state-controlled key study intersection of the SR-57 NB Ramps/Chapman Avenue is forecast to operate at an acceptable LOS during the weekday PM peak hour with implementation of improvements.

- ***State of California (Caltrans) Methodology (Saturday Field Event)*** – The results of the Existing Plus Project Saturday, Year 2020 Plus Project Saturday and Year 2030 Buildout Plus Project Saturday traffic analyses using the State of California (Caltrans) Methodology indicates that the proposed Project ***will not*** significantly impact the six (6) state-controlled study intersections. The six (6) state-controlled study intersections are forecast to operate at acceptable service levels during the Saturday Event Arrival peak hour and Saturday Event Departure peak hour with the addition of Project generated traffic to existing traffic, Year 2020 traffic and Year 2030 traffic.

- ***Off-Ramp Queuing Analysis*** – Adequate storage is provided at the off-ramps for all six (6) state-controlled study intersections under Existing plus Project, Year 2020 plus Project and Year 2030 Buildout plus Project traffic conditions during the weekday PM peak hour, Saturday Event Arrival peak hour, and Saturday Event Departure peak hour.
  
- ***Caltrans Basic Freeway Analysis*** – The development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact one (1) of the seven (7) freeway segments under Existing plus Project Saturday traffic conditions, two (2) of the seven (7) freeway segments under Year 2020 Cumulative plus Project Saturday traffic conditions and three (3) of the seven (7) freeway segments under Year 2030 Buildout plus Project Saturday traffic conditions. However, the SR-57 and SR-91 Freeways are controlled exclusively by the State of California and there is no mechanism by which the lead agency can construct or guarantee the construction of any improvements to these freeway segments. Therefore, the proposed Project’s incremental impacts on key freeway study segments assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative mainline impacts to below significance thresholds or achieve acceptable service level goals.
  
- ***Caltrans Ramp Junction Merge and Diverge Analysis*** – The development of the Project in combination with cumulative development and ambient traffic growth is anticipated to significantly impact none of the seven (7) freeway ramp junctions under Existing plus Project Saturday traffic conditions, one (1) of the seven (7) freeway ramp junctions under Year 2020 Cumulative plus Project Saturday traffic conditions, and three (3) of the seven (7) freeway ramp junctions under Year 2030 Buildout plus Project Saturday traffic conditions. However, the SR-57 and SR-91 Freeways are controlled exclusively by the State and there is no mechanism by which the lead agency can construct or guarantee the construction of any improvements to these ramp junctions. Therefore, the proposed Project’s incremental impacts on the freeway ramp junctions assessed in the report are considered unmitigatable as there are no feasible mitigation measures that will reduce cumulative impacts to below significance thresholds or achieve acceptable service level goals.
  
- ***Recommended Existing Plus Project Improvements*** – The results of the intersection capacity analysis presented previously in *Table 8-1* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Existing Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

The results of the intersection capacity analysis presented previously in *Table 8-2* shows that the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections under the “Existing Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the existing plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- ***Recommended Year 2020 Plus Project Improvements*** – The results of the intersection capacity analysis presented previously in *Table 8-3* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

The results of the intersection capacity analysis presented previously in *Table 8-4* shows that the proposed Project (i.e. field event) will significantly impact three (3) of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the Year 2020 plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS). The Project’s fair share contribution totals 100.0%.
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic

cones/delineators and/or programmable changeable message signs (PCMS). The Project's fair share contribution totals 100.0%.

- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS). The Project's fair share contribution totals 100.0%.
- **Recommended Year 2030 Buildout Plus Project Improvements** – The results of the intersection capacity analysis presented previously in *Table 8-5* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the thirty-one (31) key study intersections under the “Year 2030 Buildout Plus Project Weekday” traffic scenario. Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

The results of the intersection capacity analysis presented previously in *Table 8-6* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Year 2030 Buildout Plus Project Saturday” traffic scenario. The following are improvements recommended to mitigate the Year 2030 buildout plus project Saturday traffic impacts:

- **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS). The Project's fair share contribution totals 100.0%.
- **No. 12 – State College Boulevard at Chapman Avenue:** Widen and restripe the westbound approach of Chapman Avenue to provide a 2<sup>nd</sup> westbound left-turn lane. Modify the existing traffic signal as necessary. Right-of-way acquisition will be required. Source: *CollegeTown Draft Environmental Impact Report (DEIR)*. The installation of these improvements is subject to the approval of the City of Fullerton. Since the proposed Project cannot guarantee that these improvements that are located in the City of Fullerton will be implemented, the impact is significant and unavoidable. The Project's fair share contribution totals 24.9%.
- **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event arrival period and event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include

routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS). The Project's fair share contribution totals 100.0%.

- **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS). The Project's fair share contribution totals 100.0%.

- ***Recommended Existing Plus Project Improvements (Caltrans)*** – The results of the intersection capacity analysis presented previously in *Table 9-1* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the six (6) state-controlled study intersections under the “Existing Plus Project Weekday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

The results of the intersection capacity analysis presented previously in *Table 9-2* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the “Existing Plus Project Saturday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

- ***Recommended Year 2020 Plus Project Improvements (Caltrans)*** – The results of the intersection capacity analysis presented previously in *Table 9-3* shows that the proposed Project (i.e. academic instruction) will not significantly impact any of the six (6) state-controlled study intersections under the “Year 2020 Plus Project Weekday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

The results of the intersection capacity analysis presented previously in *Table 9-4* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the “Year 2020 Plus Project Saturday” traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

- ***Recommended Year 2030 Buildout Plus Project Improvements (Caltrans)*** – The results of the intersection capacity analysis presented previously in *Table 9-5* shows that the proposed Project (i.e. academic instruction) will significantly impact one (1) of the six (6) state-controlled study intersections under the “Year 2030 Buildout Plus Project Weekday” traffic scenario. The following are improvements recommended to mitigate the Year 2030 Buildout plus Project Weekday traffic impacts:

- **No. 14 – SR-57 NB Ramps at Chapman Avenue:** Widen and restripe the westbound approach of Chapman Avenue to provide a 3<sup>rd</sup> westbound through lane. Modify the

existing traffic signal as necessary. Right-of-way acquisition will be required. Source: *CollegeTown Draft Environmental Impact Report (DEIR)*. The installation of these improvements is subject to the approval of Caltrans and the City of Fullerton. Since the proposed Project cannot guarantee that these improvements that are located in the City of Fullerton and/or also under the jurisdiction of Caltrans will be implemented, the impact is significant and unavoidable. The Project's fair share contribution totals 0.6%.

The results of the intersection capacity analysis presented previously in *Table 9-6* shows that the proposed Project (i.e. field event) will not significantly impact any of the six (6) state-controlled study intersections under the "Year 2030 Buildout Plus Project Saturday" traffic scenario (Caltrans Methodology). Given that there are no significant project impacts, no improvements are required to address this traffic scenario.

- ***Friday Field Event Analysis (Existing Plus Project)*** – The proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-seven (27) key study intersections currently operate and are forecast to continue to operate at an acceptable service level during the Friday Event Arrival peak hour and Friday Event Departure peak hour with the addition of Project generated traffic to existing traffic. The intersections operating at an adverse level of service under Existing plus Project Friday traffic conditions are as follows:

<u>Key Intersection</u>	<u>Friday Arrival</u>		<u>Friday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	93.5 s/v	F
27. Lemon Street at Fullerton College Drive	---	---	541.9 s/v	F
28. Berkeley Avenue at College Driveway No. 1	---	---	44.5 s/v	E
29. Berkeley Avenue at College Driveway No. 2	---	---	56.7 s/v	F

The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Lemon Street/Fullerton College Drive, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

- ***Friday Field Event Analysis (Year 2020 Plus Project)*** – The proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. The remaining twenty-seven (27) key study intersections are forecast to continue to operate at an acceptable service level during the Friday Event Arrival peak hour and Friday Event Departure peak hour with the addition of Project generated traffic to Year 2020 cumulative traffic. The intersections operating at an adverse level of service under Year 2020 plus project Friday traffic conditions are as follows:



<u>Key Intersection</u>	<u>Friday Arrival</u>		<u>Friday Departure</u>	
	<u>ICU/HCM</u>	<u>LOS</u>	<u>ICU/HCM</u>	<u>LOS</u>
4. Lemon Street at Berkeley Avenue	---	---	98.1 s/v	F
27. Lemon Street at Fullerton College Drive	---	---	554.2 s/v	F
28. Berkeley Avenue at College Driveway No. 1	---	---	46.8 s/v	E
29. Berkeley Avenue at College Driveway No. 2	---	---	60.2 s/v	F

The implementation of improvements (i.e. Traffic Management Plan) at the impacted key study intersections of Lemon Street/Berkeley Avenue, Lemon Street/Fullerton College Drive, Berkeley Avenue/College Driveway No. 1 and Berkeley Avenue/College Driveway No. 2 will improve the intersections level of service operation to an acceptable level.

- ***Friday Field Event – Recommended Existing Plus Project Improvements*** – The results of the intersection capacity analysis presented previously in *Table 12-1* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Existing Plus Project Friday” traffic scenario. The following are improvements recommended to mitigate the Existing plus Project Friday traffic impacts:
  - **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 27 – Lemon Street at Fullerton College Drive:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the

location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).

- **Friday Field Event – Recommended Year 2020 Plus Project Improvements** – The results of the intersection capacity analysis presented previously in *Table 12-2* shows that the proposed Project (i.e. field event) will significantly impact four (4) of the thirty-one (31) key study intersections under the “Year 2020 Plus Project Friday” traffic scenario. The following are improvements recommended to mitigate the Year 2020 plus Project Friday traffic impacts:
  - **No. 4 – Lemon Street at Berkeley Avenue:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 27 – Lemon Street at Fullerton College Drive:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts at the intersection. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include intersection signal timing adjustments to improve traffic flow, routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 28 – Berkeley Avenue at College Driveway No. 1:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
  - **No. 29 – Berkeley Avenue at College Driveway No. 2:** Implement a Traffic Management Plan (TMP) during the event departure period to minimize traffic impacts on Berkeley Avenue. The TMP will consist of providing police department staff at the location to manage traffic flow. The TMP is subject to the approval of the City of Fullerton. Other components of the event TMP may include routing of traffic via traffic cones/delineators and/or programmable changeable message signs (PCMS).
- **Construction Traffic Impact Assessment** – Traffic impacts to the adjacent roadway network will be minimal and **not** long-term. Further, since the construction-related trip generation potential of the proposed Project (i.e. all five construction components) is less than that of the proposed Project (i.e. weekday academic instruction) and the proposed Project (i.e. weekday academic instruction) is not expected to significantly impact any of the key study intersections, no significant impacts resulting from construction traffic are anticipated aside from the nuisance traffic that will occur

as a result of construction-related traffic (e.g., construction materials, construction workers, etc.). Nevertheless, to reduce the impact of construction-related traffic, the implementation of a Construction Management Plan is recommended to minimize traffic impacts upon the local circulation system in the area. The Construction Management Plan should be developed in coordination with the City of Fullerton and at a minimum, address the following:

- Traffic control for any street closure, detour, or other disruption to traffic circulation.
- Identify the routes that construction vehicles will utilize for the delivery of construction materials to access the site, traffic controls and detours, and proposed construction phasing plan for the project.
- Specify the hours during which transport activities can occur and methods to mitigate construction-related impacts to adjacent streets.
- Require the Applicant to keep all haul routes clean and free of debris including but not limited to gravel and dirt as a result of its operations. The Applicant shall clean adjacent streets, as directed by the City Engineer (or representative of the City Engineer), of any material which may have been spilled, tracked, or blown onto adjacent streets or areas.
- Hauling or transport of oversize loads will be allowed between the hours of 7:00 AM and 5:00 PM only, Monday through Friday, unless approved otherwise by the City Engineer. No hauling or transport will be allowed during nighttime hours, weekends, or federal holidays.
- Use of local streets shall be prohibited.
- Haul trucks entering or exiting public streets shall at all times yield to public traffic.
- All construction-related parking and staging of vehicles will be kept out of the adjacent public roadways and will occur on-site.
- This Construction Management Plan shall meet standards established in the current *California Manual on Uniform Traffic Control Device (MUTCD)* as well as City of Fullerton requirements

## APPENDIX A

### EXISTING TRAFFIC COUNT DATA

*APPENDIX A-1*

**WEEKDAY PM PEAK HOUR INTERSECTION COUNTS**

# Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 17-1047-004

Day: Tuesday

City: Fullerton

Date: 3/7/2017

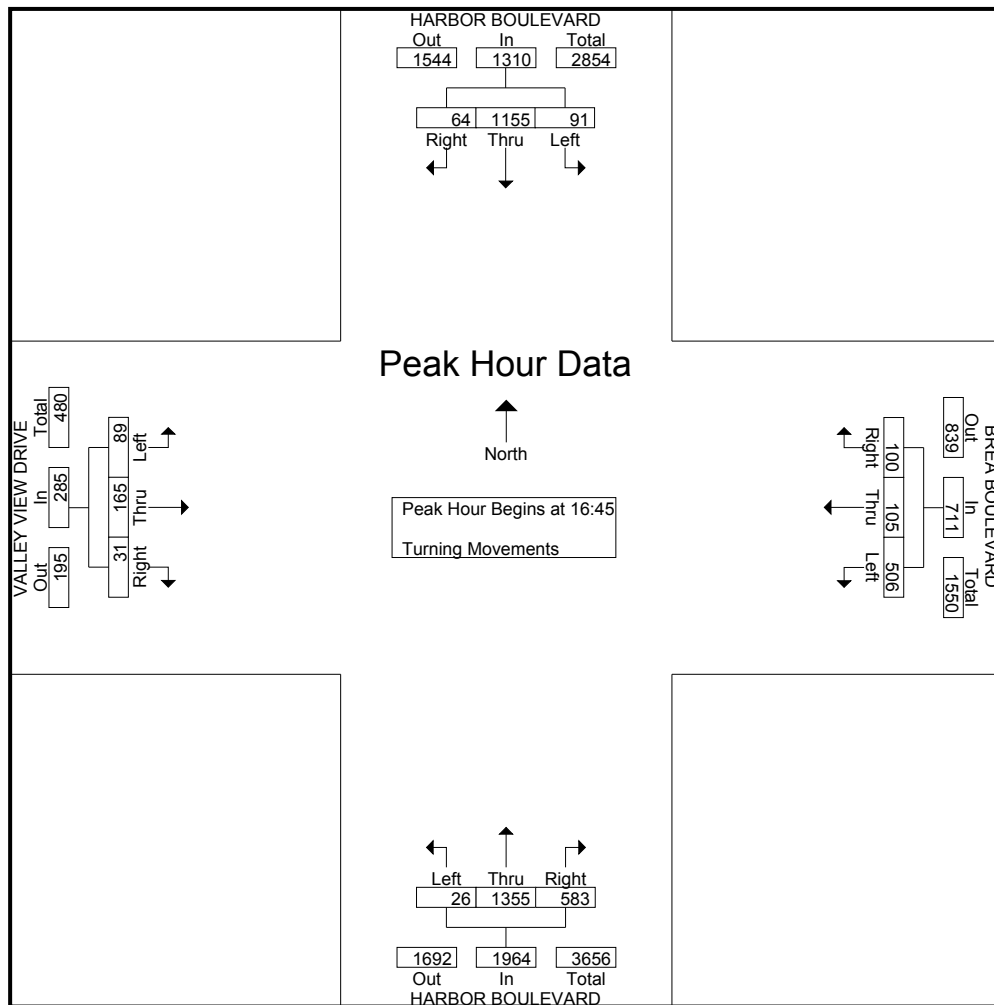
PM													
NS/EW Streets:	Harbor Blvd			Harbor Blvd			Bastanchury Rd			Bastanchury Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2.5	ER 0.5	WL 2	WT 3	WR 1	TOTAL
4:00 PM	52	298	48	91	214	78	67	276	37	56	249	90	1556
4:15 PM	75	313	47	83	202	60	69	296	61	49	250	85	1590
4:30 PM	59	303	48	74	250	80	79	289	48	43	253	84	1610
4:45 PM	66	340	41	81	204	85	73	291	52	49	262	71	1615
5:00 PM	78	290	65	73	229	97	68	313	46	29	263	61	1612
5:15 PM	76	311	39	84	246	95	56	310	39	42	261	86	1645
5:30 PM	69	307	62	75	238	91	79	317	31	59	260	91	1679
5:45 PM	58	290	49	90	206	80	71	302	30	51	260	61	1548
<b>TOTAL VOLUMES :</b>	533	2452	399	651	1789	666	562	2394	344	378	2058	629	12855
<b>APPROACH %'s :</b>	15.75%	72.46%	11.79%	20.96%	57.60%	21.44%	17.03%	72.55%	10.42%	12.33%	67.15%	20.52%	
<b>PEAK HR START TIME :</b>	445 PM												<b>TOTAL</b>
<b>PEAK HR VOL :</b>	289	1248	207	313	917	368	276	1231	168	179	1046	309	6551
<b>PEAK HR FACTOR :</b>	0.975			0.940			0.981			0.935			0.975

CONTROL : Signalized

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW/BREA BLVD

File Name : H1611002  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

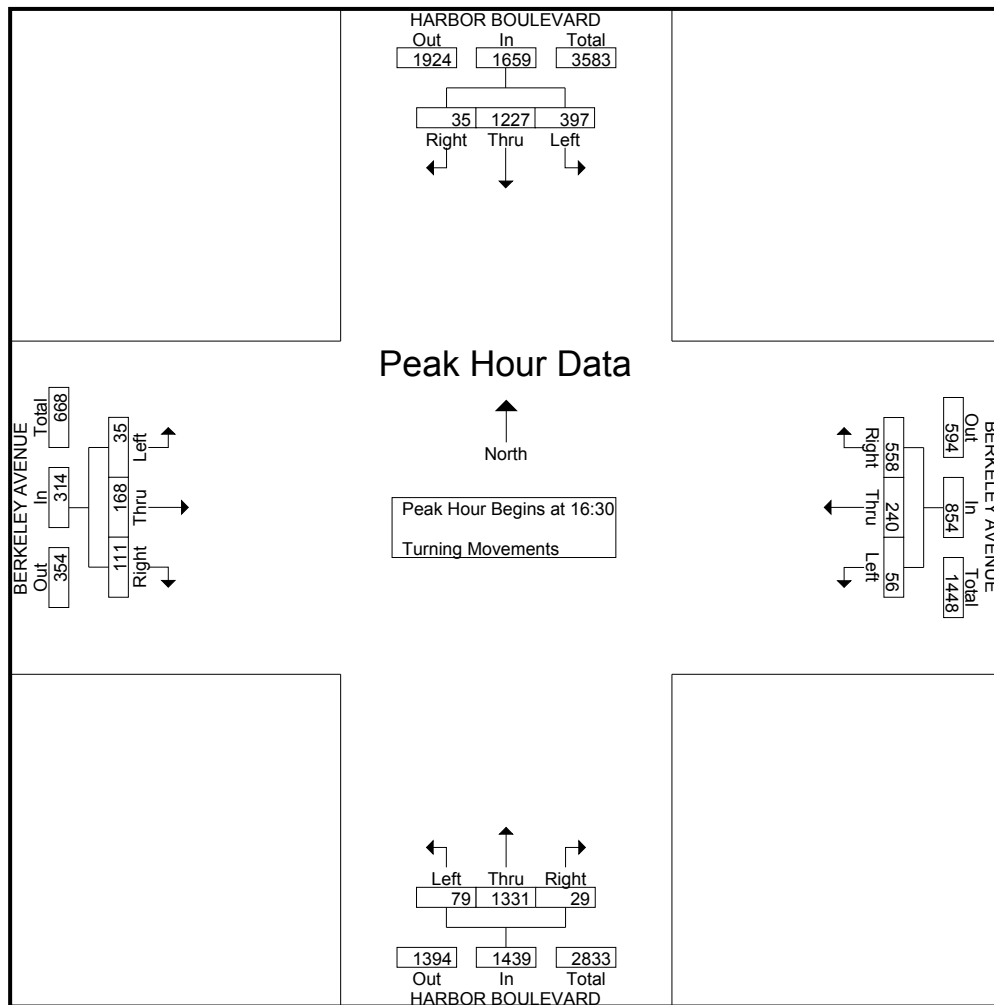
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Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	20	291	20	331	26	28	122	176	144	324	6	474	8	38	27	73	1054
17:00	19	294	22	335	26	27	112	165	155	332	4	491	13	48	21	82	1073
17:15	15	308	26	349	25	26	141	192	132	352	5	489	4	35	16	55	1085
17:30	10	262	23	295	23	24	131	178	152	347	11	510	6	44	25	75	1058
Total Volume	64	1155	91	1310	100	105	506	711	583	1355	26	1964	31	165	89	285	4270
% App. Total	4.9	88.2	6.9		14.1	14.8	71.2		29.7	69	1.3		10.9	57.9	31.2		
PHF	.800	.938	.875	.938	.962	.938	.897	.926	.940	.962	.591	.963	.596	.859	.824	.869	.984



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : h1611003  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

	HARBOR BOULEVARD Southbound				BERKELEY AVENUE Westbound				HARBOR BOULEVARD Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	11	274	89	374	132	58	13	203	9	325	17	351	34	47	8	89	1017
16:45	9	313	113	435	138	56	12	206	5	334	20	359	29	40	11	80	1080
17:00	6	315	87	408	141	60	13	214	9	332	18	359	28	44	10	82	1063
17:15	9	325	108	442	147	66	18	231	6	340	24	370	20	37	6	63	1106
Total Volume	35	1227	397	1659	558	240	56	854	29	1331	79	1439	111	168	35	314	4266
% App. Total	2.1	74	23.9		65.3	28.1	6.6		2	92.5	5.5		35.4	53.5	11.1		
PHF	.795	.944	.878	.938	.949	.909	.778	.924	.806	.979	.823	.972	.816	.894	.795	.882	.964

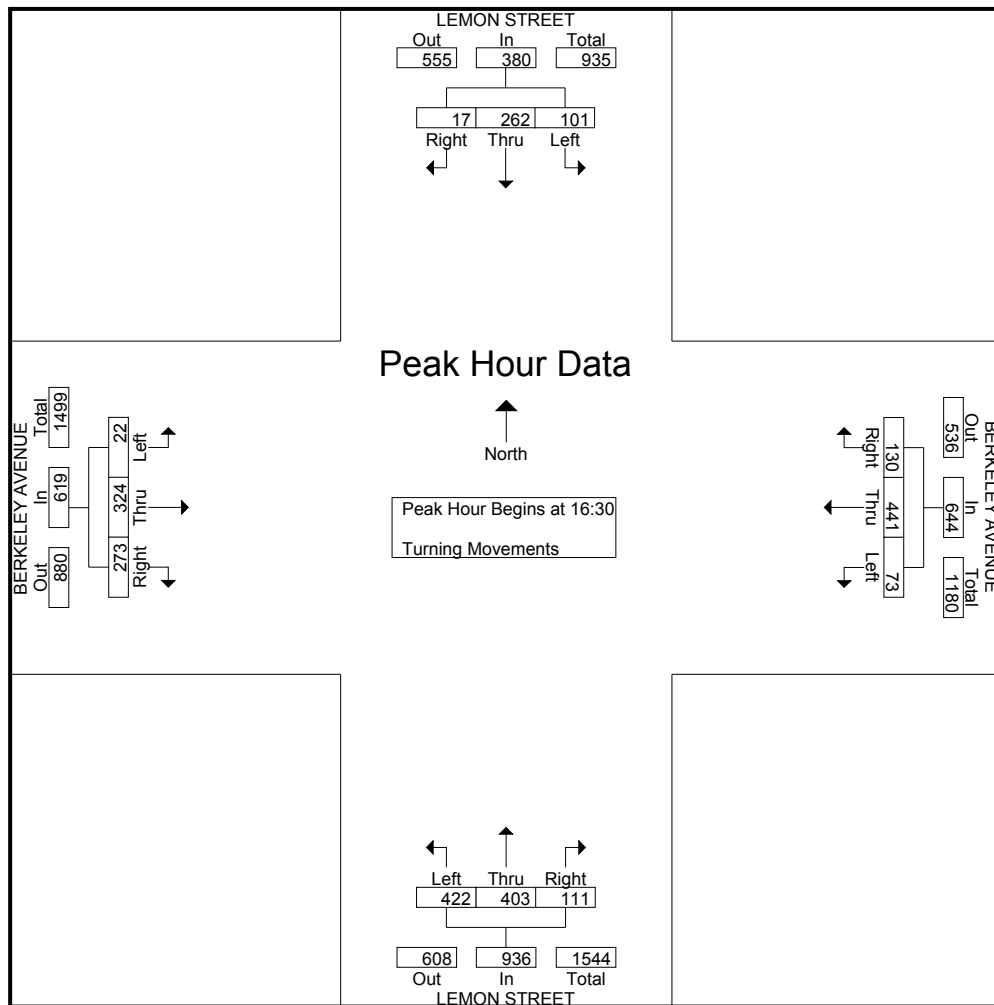




City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: BERKELEY AVENUE

File Name : H1611004  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

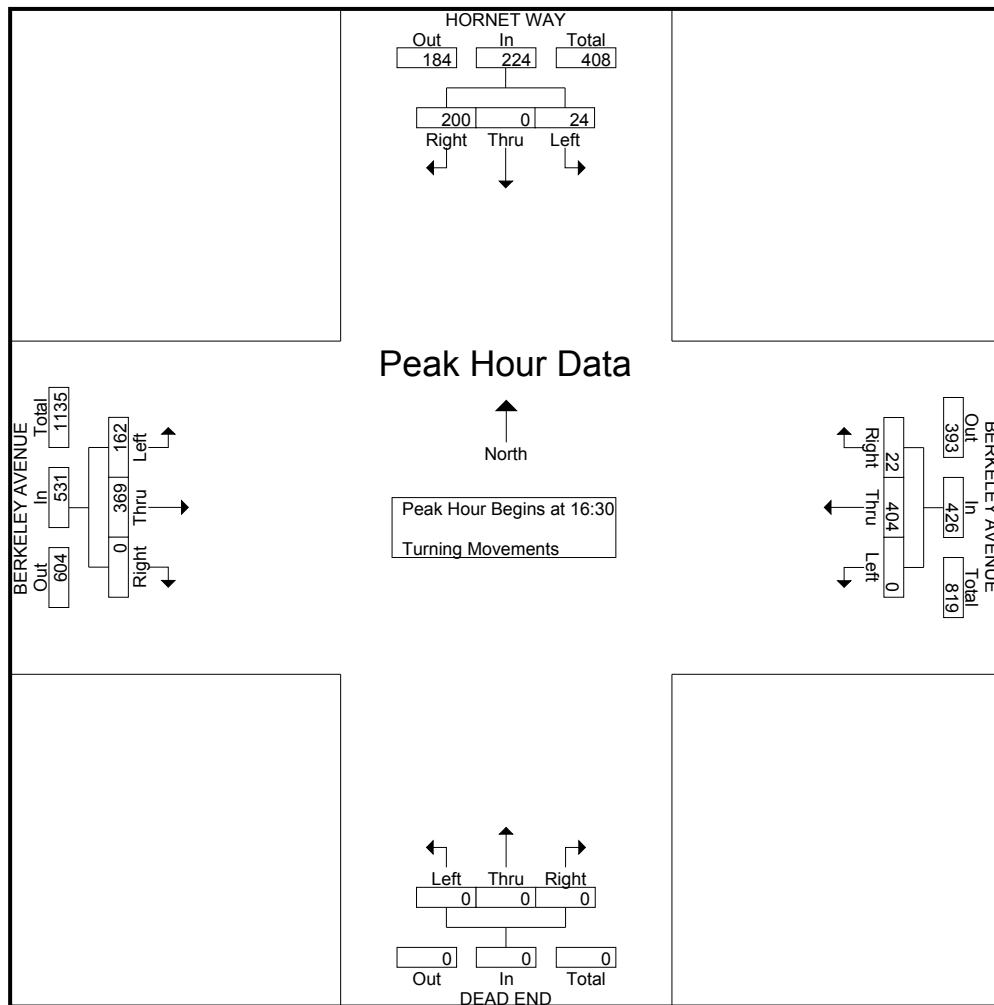
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Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	3	49	20	72	42	118	18	178	36	96	114	246	65	80	4	149	645
16:45	5	76	19	100	23	102	15	140	17	97	99	213	75	82	6	163	616
17:00	5	73	29	107	28	113	18	159	32	112	93	237	59	85	7	151	654
17:15	4	64	33	101	37	108	22	167	26	98	116	240	74	77	5	156	664
Total Volume	17	262	101	380	130	441	73	644	111	403	422	936	273	324	22	619	2579
% App. Total	4.5	68.9	26.6		20.2	68.5	11.3		11.9	43.1	45.1		44.1	52.3	3.6		
PHF	.850	.862	.765	.888	.774	.934	.830	.904	.771	.900	.909	.951	.910	.953	.786	.949	.971



City: FULLERTON  
N-S Direction: HORNET WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1611005  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

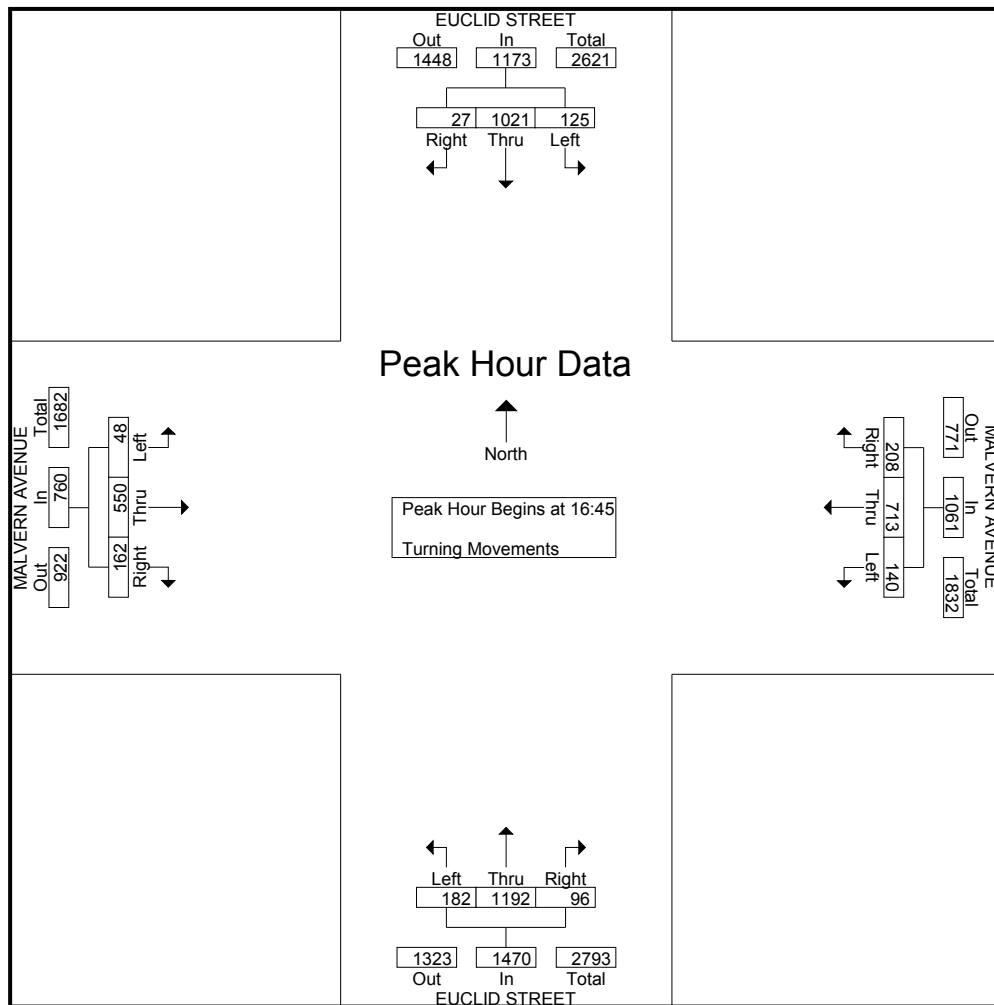
	HORNET WAY Southbound				BERKELEY AVENUE Westbound				DEAD END Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	49	0	10	59	6	104	0	110	0	0	0	0	0	90	48	138	307
16:45	34	0	5	39	4	100	0	104	0	0	0	0	0	76	36	112	255
17:00	58	0	7	65	6	103	0	109	0	0	0	0	0	98	46	144	318
17:15	59	0	2	61	6	97	0	103	0	0	0	0	0	105	32	137	301
Total Volume	200	0	24	224	22	404	0	426	0	0	0	0	0	369	162	531	1181
% App. Total	89.3	0	10.7		5.2	94.8	0		0	0	0	0	0	69.5	30.5		
PHF	.847	.000	.600	.862	.917	.971	.000	.968	.000	.000	.000	.000	.000	.879	.844	.922	.928



City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: MALVERN AVENUE

File Name : H1611006  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

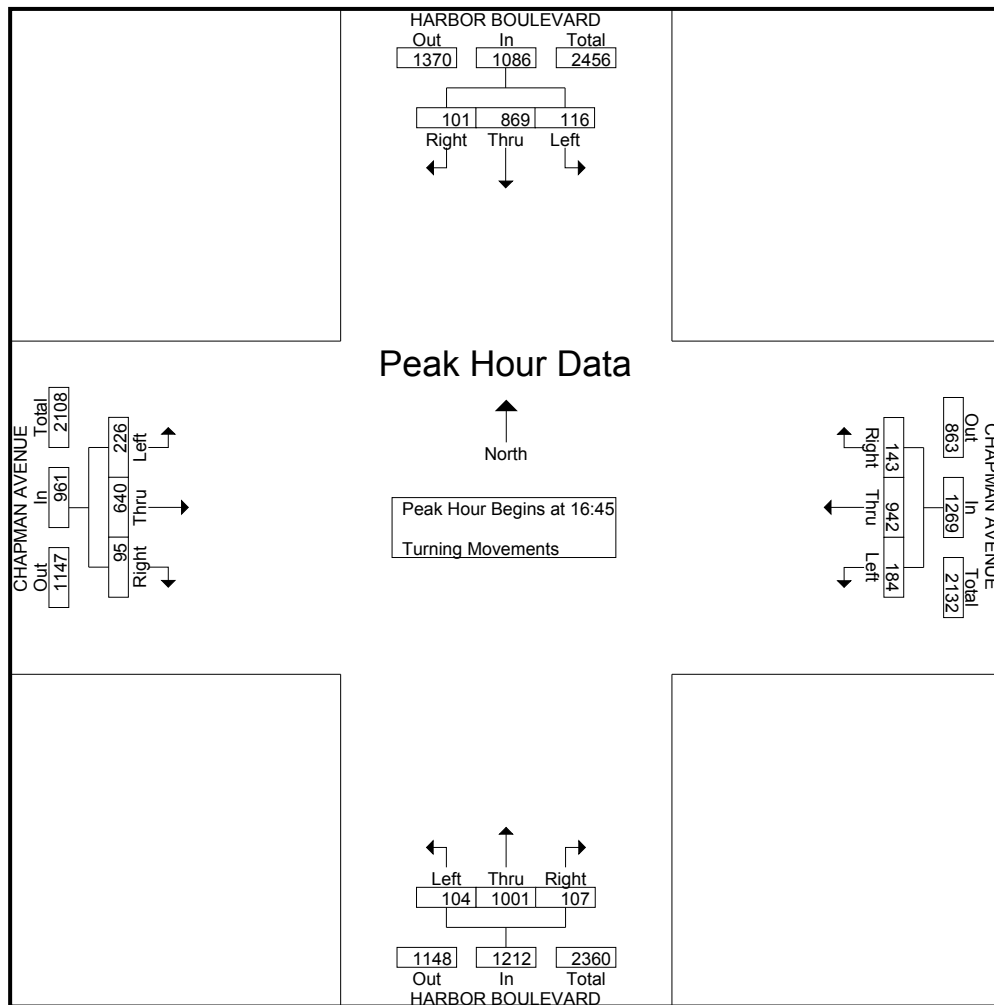
	EUCLID STREET Southbound				MALVERN AVENUE Westbound				EUCLID STREET Northbound				MALVERN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	10	264	25	299	45	169	41	255	25	291	48	364	42	134	13	189	1107
17:00	6	260	32	298	48	177	41	266	27	294	42	363	40	149	15	204	1131
17:15	6	275	37	318	55	163	24	242	14	317	48	379	44	130	10	184	1123
17:30	5	222	31	258	60	204	34	298	30	290	44	364	36	137	10	183	1103
Total Volume	27	1021	125	1173	208	713	140	1061	96	1192	182	1470	162	550	48	760	4464
% App. Total	2.3	87	10.7		19.6	67.2	13.2		6.5	81.1	12.4		21.3	72.4	6.3		
PHF	.675	.928	.845	.922	.867	.874	.854	.890	.800	.940	.948	.970	.920	.923	.800	.931	.987



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1611007  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

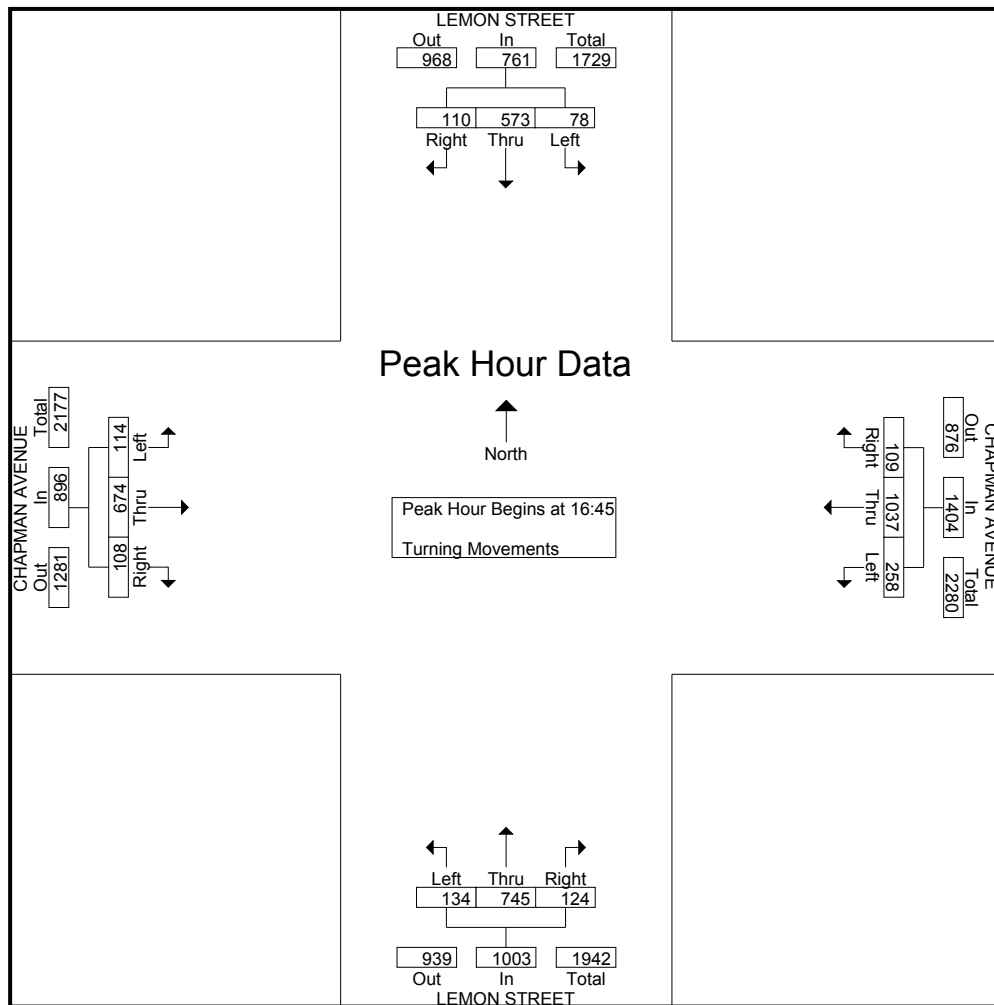
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Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	26	230	25	281	38	209	47	294	31	262	28	321	35	140	49	224	1120
17:00	29	212	33	274	30	232	42	304	25	251	28	304	17	182	59	258	1140
17:15	22	209	33	264	45	248	46	339	21	240	36	297	19	163	57	239	1139
17:30	24	218	25	267	30	253	49	332	30	248	12	290	24	155	61	240	1129
Total Volume	101	869	116	1086	143	942	184	1269	107	1001	104	1212	95	640	226	961	4528
% App. Total	9.3	80	10.7		11.3	74.2	14.5		8.8	82.6	8.6		9.9	66.6	23.5		
PHF	.871	.945	.879	.966	.794	.931	.939	.936	.863	.955	.722	.944	.679	.879	.926	.931	.993



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1611008  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

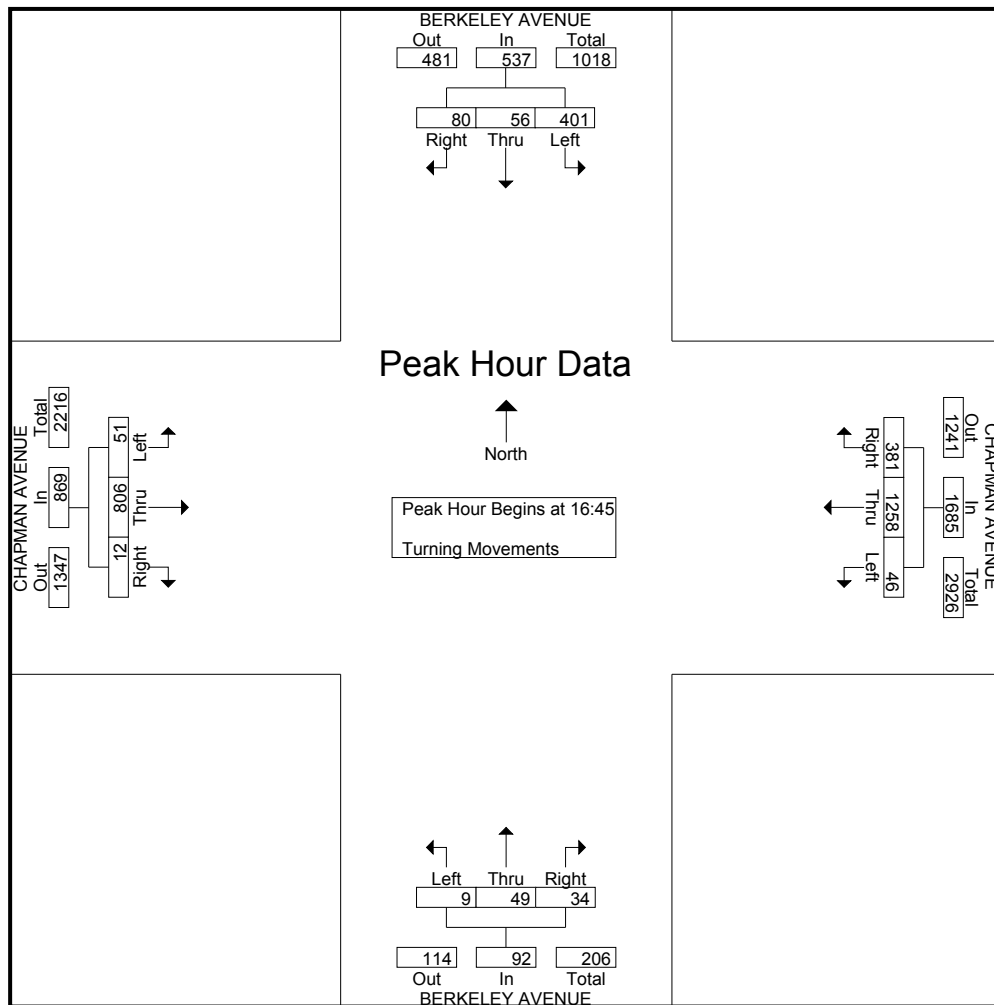
	LEMON STREET Southbound				CHAPMAN AVENUE Westbound				LEMON STREET Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	28	146	17	191	24	215	51	290	32	167	38	237	31	153	24	208	926
17:00	26	132	31	189	22	258	68	348	36	186	26	248	26	197	34	257	1042
17:15	24	163	12	199	31	293	58	382	27	213	40	280	34	165	26	225	1086
17:30	32	132	18	182	32	271	81	384	29	179	30	238	17	159	30	206	1010
Total Volume	110	573	78	761	109	1037	258	1404	124	745	134	1003	108	674	114	896	4064
% App. Total	14.5	75.3	10.2		7.8	73.9	18.4		12.4	74.3	13.4		12.1	75.2	12.7		
PHF	.859	.879	.629	.956	.852	.885	.796	.914	.861	.874	.838	.896	.794	.855	.838	.872	.936



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1611009  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

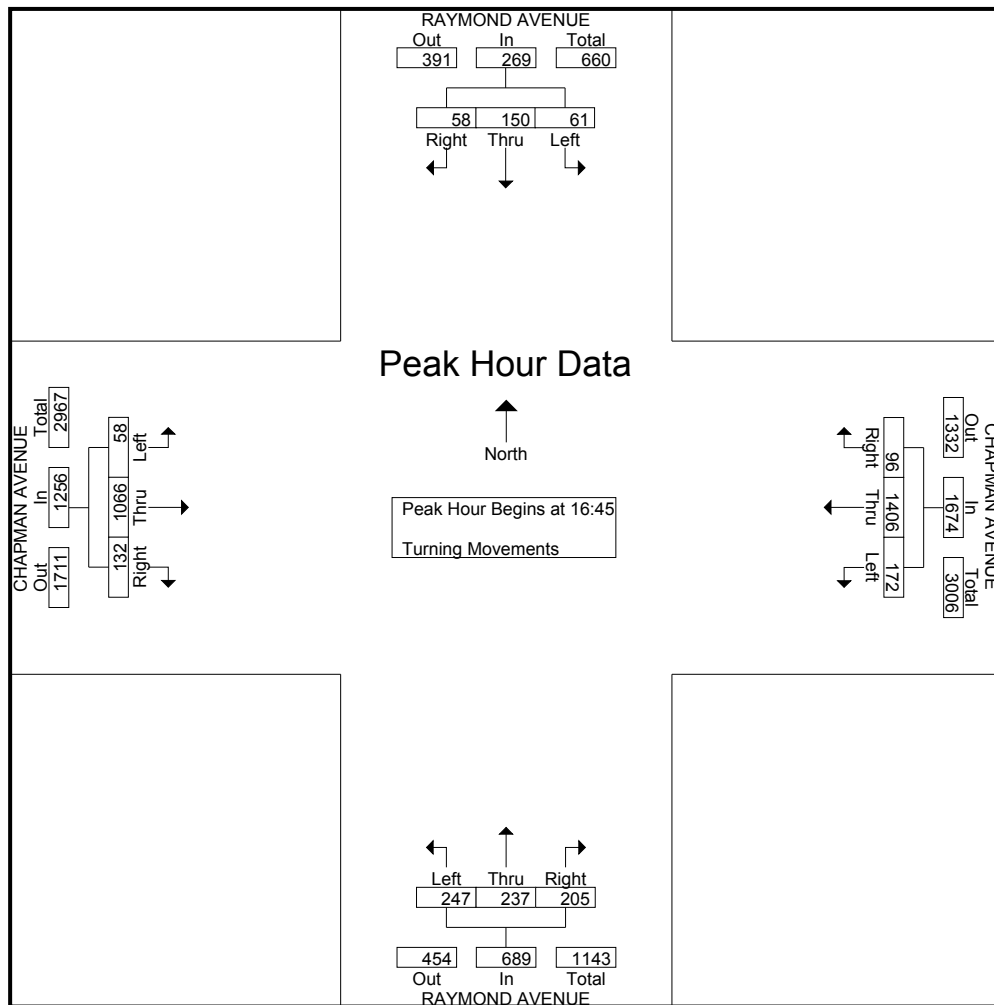
	BERKELEY AVENUE Southbound				CHAPMAN AVENUE Westbound				BERKELEY AVENUE Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	20	7	95	122	91	268	7	366	9	11	1	21	4	198	9	211	720
17:00	21	16	101	138	79	314	10	403	5	10	1	16	3	228	11	242	799
17:15	20	18	108	146	100	361	14	475	10	14	5	29	1	186	21	208	858
17:30	19	15	97	131	111	315	15	441	10	14	2	26	4	194	10	208	806
Total Volume	80	56	401	537	381	1258	46	1685	34	49	9	92	12	806	51	869	3183
% App. Total	14.9	10.4	74.7		22.6	74.7	2.7		37	53.3	9.8		1.4	92.8	5.9		
PHF	.952	.778	.928	.920	.858	.871	.767	.887	.850	.875	.450	.793	.750	.884	.607	.898	.927



City: FULLERTON  
N-S Direction: RAYMOND AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1611010  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

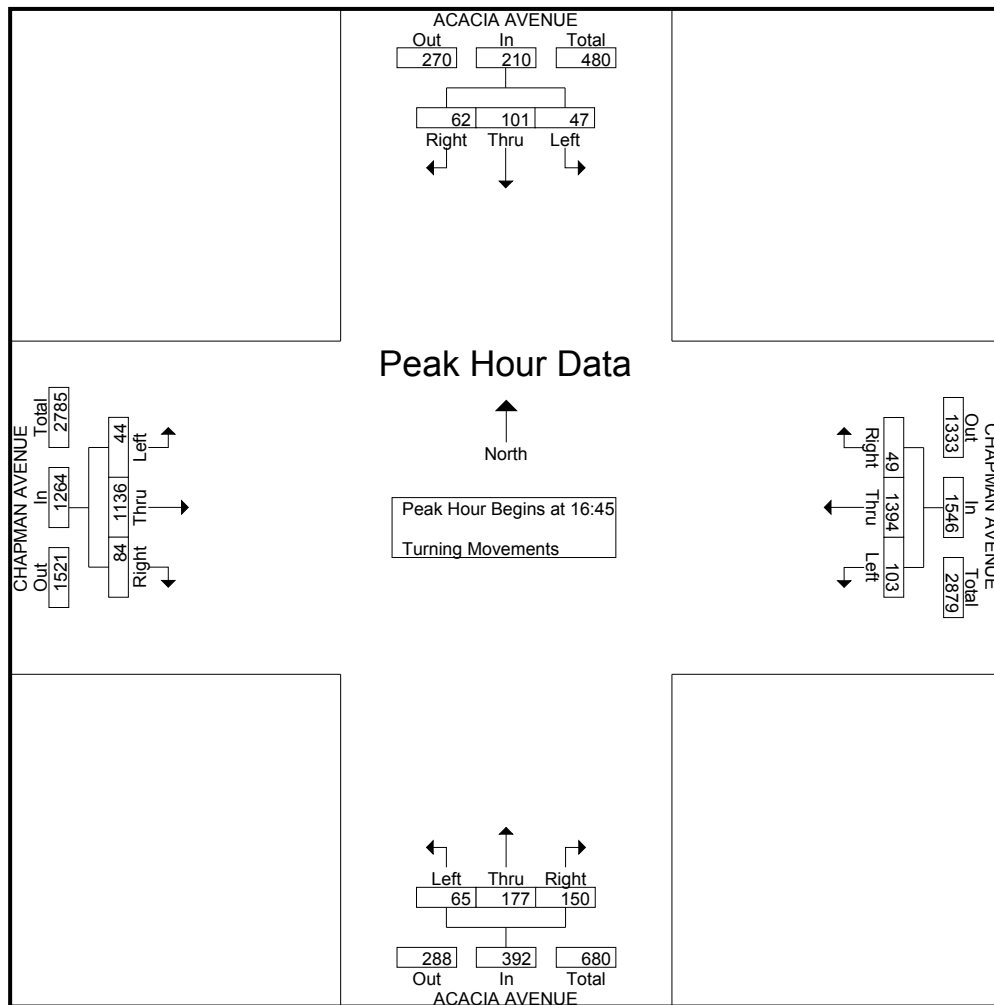
	RAYMOND AVENUE Southbound				CHAPMAN AVENUE Westbound				RAYMOND AVENUE Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	10	37	18	65	18	301	40	359	49	65	44	158	30	268	13	311	893
17:00	14	42	11	67	31	334	41	406	52	67	75	194	41	259	17	317	984
17:15	22	34	16	72	21	393	44	458	58	49	73	180	30	272	11	313	1023
17:30	12	37	16	65	26	378	47	451	46	56	55	157	31	267	17	315	988
Total Volume	58	150	61	269	96	1406	172	1674	205	237	247	689	132	1066	58	1256	3888
% App. Total	21.6	55.8	22.7		5.7	84	10.3		29.8	34.4	35.8		10.5	84.9	4.6		
PHF	.659	.893	.847	.934	.774	.894	.915	.914	.884	.884	.823	.888	.805	.980	.853	.991	.950



City: FULLERTON  
N-S Direction: ACACIA AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1611011  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

	ACACIA AVENUE Southbound				CHAPMAN AVENUE Westbound				ACACIA AVENUE Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	12	24	13	49	11	302	20	333	40	<b>75</b>	15	130	<b>24</b>	273	12	309	821
17:00	18	23	<b>15</b>	56	<b>14</b>	336	27	377	<b>54</b>	55	<b>24</b>	<b>133</b>	17	261	<b>15</b>	293	859
17:15	<b>21</b>	<b>28</b>	12	<b>61</b>	14	<b>379</b>	25	<b>418</b>	27	27	14	68	19	<b>317</b>	11	<b>347</b>	<b>894</b>
17:30	11	26	7	44	10	377	<b>31</b>	418	29	20	12	61	24	285	6	315	838
Total Volume	62	101	47	210	49	1394	103	1546	150	177	65	392	84	1136	44	1264	3412
% App. Total	29.5	48.1	22.4		3.2	90.2	6.7		38.3	45.2	16.6		6.6	89.9	3.5		
PHF	.738	.902	.783	.861	.875	.920	.831	.925	.694	.590	.677	.737	.875	.896	.733	.911	.954

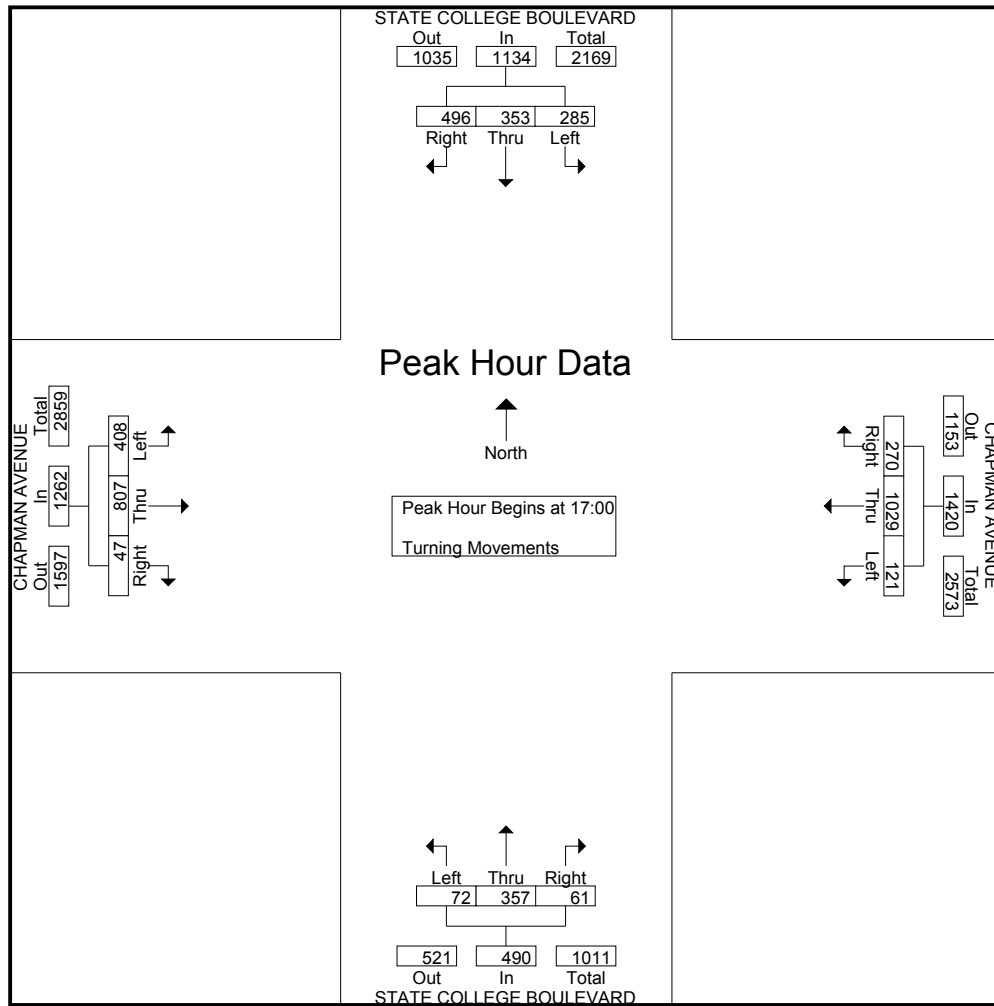




City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1611019  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

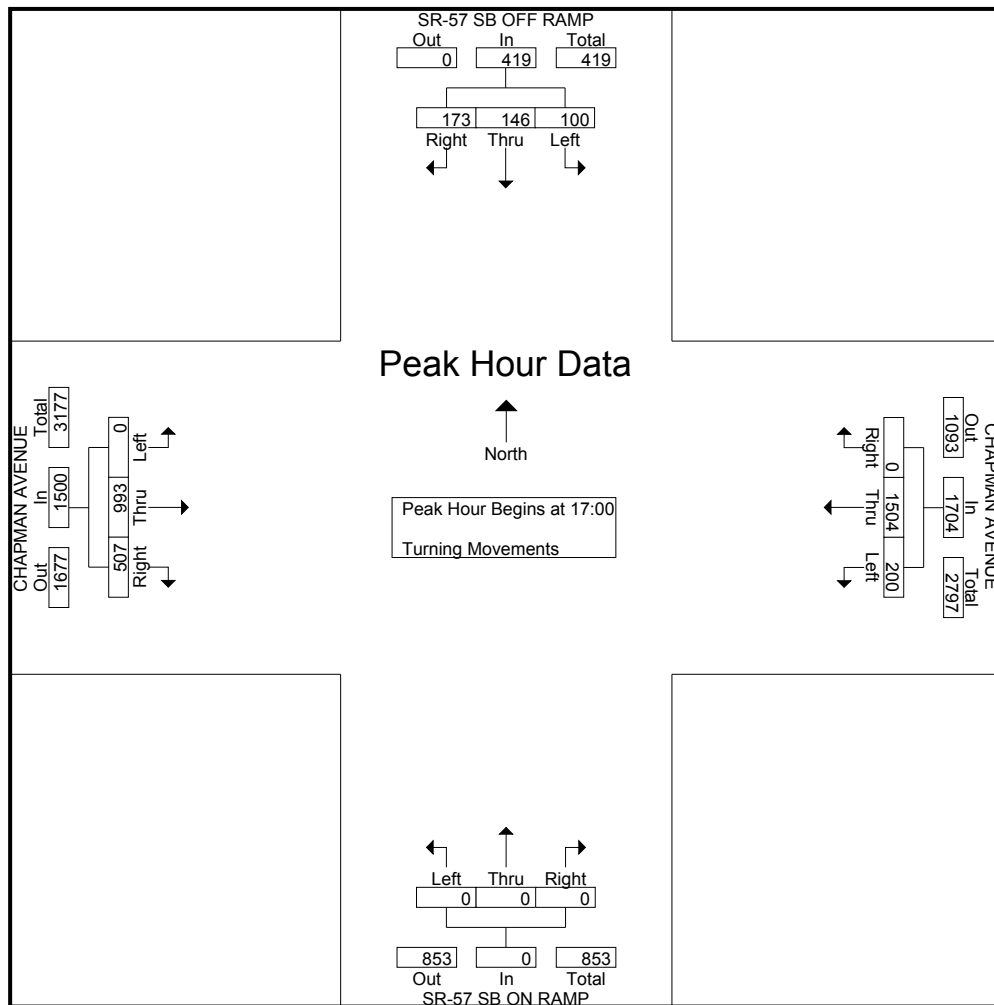
	STATE COLLEGE BOULEVARD Southbound				CHAPMAN AVENUE Westbound				STATE COLLEGE BOULEVARD Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	127	97	66	290	50	262	38	350	21	99	17	137	9	225	104	338	1115
17:15	118	95	96	309	71	259	29	359	13	90	20	123	11	200	95	306	1097
17:30	139	91	75	305	75	260	25	360	14	77	18	109	14	191	96	301	1075
17:45	112	70	48	230	74	248	29	351	13	91	17	121	13	191	113	317	1019
Total Volume	496	353	285	1134	270	1029	121	1420	61	357	72	490	47	807	408	1262	4306
% App. Total	43.7	31.1	25.1		19	72.5	8.5		12.4	72.9	14.7		3.7	63.9	32.3		
PHF	.892	.910	.742	.917	.900	.982	.796	.986	.726	.902	.900	.894	.839	.897	.903	.933	.965



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1611020  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

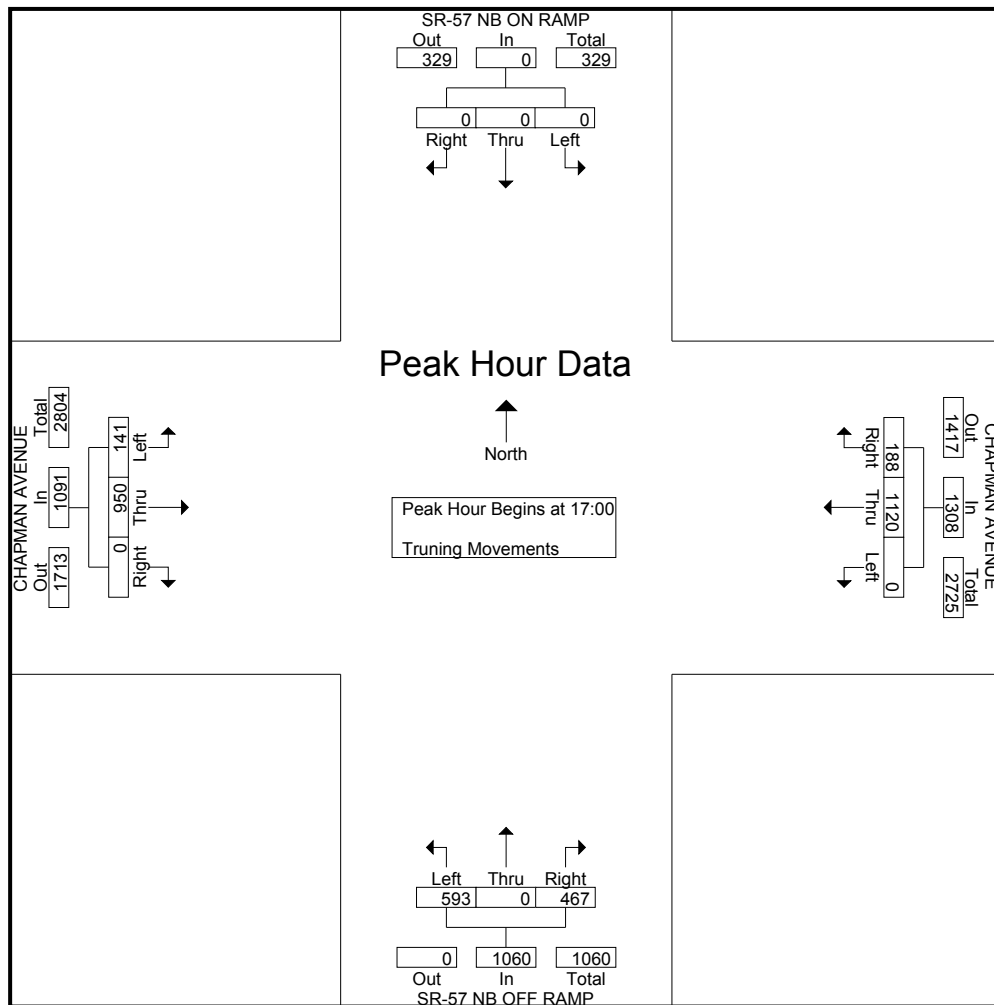
	SR-57 SB OFF RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 SB ON RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	38	21	23	82	0	373	53	426	0	0	0	0	139	238	0	377	885
17:15	36	61	27	124	0	382	55	437	0	0	0	0	127	251	0	378	939
17:30	47	49	26	122	0	368	46	414	0	0	0	0	123	258	0	381	917
17:45	52	15	24	91	0	381	46	427	0	0	0	0	118	246	0	364	882
Total Volume	173	146	100	419	0	1504	200	1704	0	0	0	0	507	993	0	1500	3623
% App. Total	41.3	34.8	23.9		0	88.3	11.7		0	0	0		33.8	66.2	0		
PHF	.832	.598	.926	.845	.000	.984	.909	.975	.000	.000	.000	.000	.912	.962	.000	.984	.965



City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1611021  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

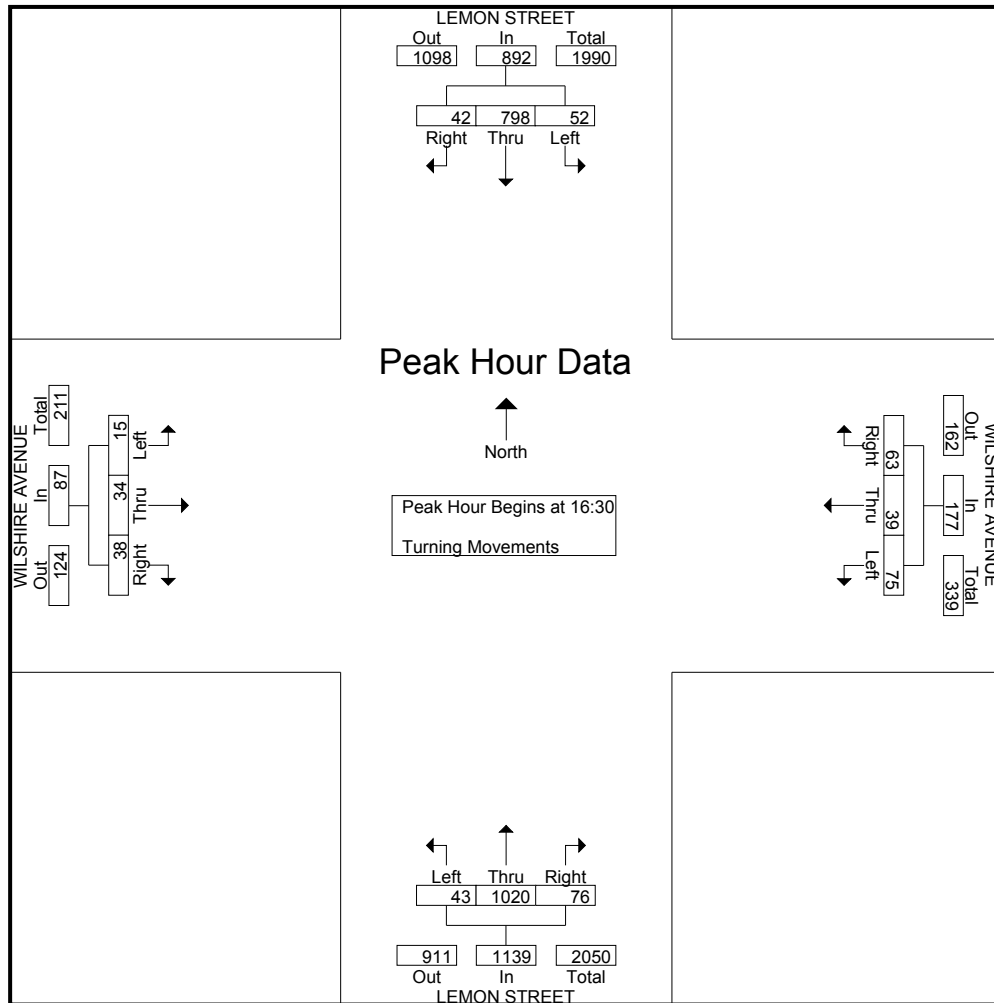
	SR-57 NB ON RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 NB OFF RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	0	0	0	0	42	277	0	319	108	0	157	265	0	227	38	265	849
17:15	0	0	0	0	57	297	0	354	125	0	133	258	0	245	33	278	890
17:30	0	0	0	0	47	277	0	324	117	0	159	276	0	242	33	275	875
17:45	0	0	0	0	42	269	0	311	117	0	144	261	0	236	37	273	845
Total Volume	0	0	0	0	188	1120	0	1308	467	0	593	1060	0	950	141	1091	3459
% App. Total	0	0	0	0	14.4	85.6	0		44.1	0	55.9		0	87.1	12.9		
PHF	.000	.000	.000	.000	.825	.943	.000	.924	.934	.000	.932	.960	.000	.969	.928	.981	.972



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1611022  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

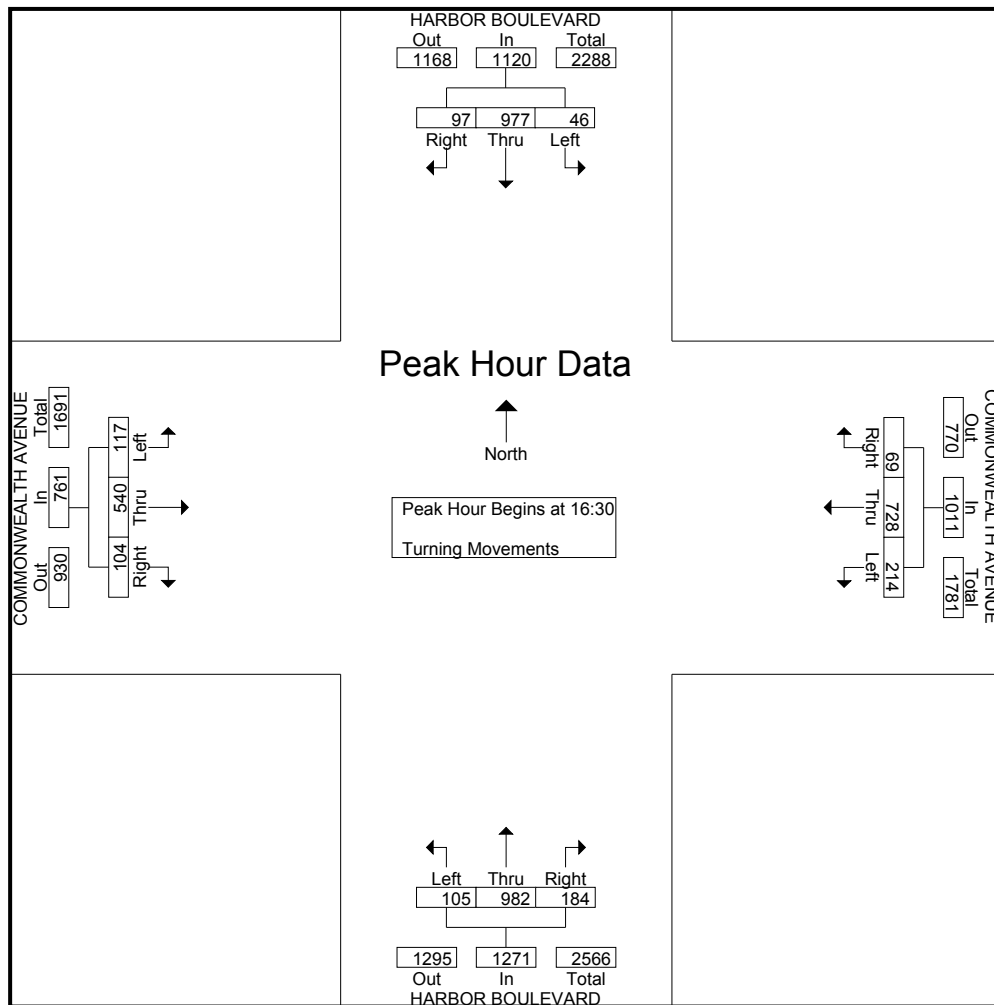
	LEMON STREET Southbound				WILSHIRE AVENUE Westbound				LEMON STREET Northbound				WILSHIRE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	6	202	8	216	12	8	20	40	17	240	6	263	5	6	6	17	536
16:45	13	180	14	207	7	7	12	26	27	258	11	296	8	7	1	16	545
17:00	8	200	15	223	22	6	24	52	16	246	14	276	14	9	5	28	579
17:15	15	216	15	246	22	18	19	59	16	276	12	304	11	12	3	26	635
Total Volume	42	798	52	892	63	39	75	177	76	1020	43	1139	38	34	15	87	2295
% App. Total	4.7	89.5	5.8		35.6	22	42.4		6.7	89.6	3.8		43.7	39.1	17.2		
PHF	.700	.924	.867	.907	.716	.542	.781	.750	.704	.924	.768	.937	.679	.708	.625	.777	.904



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1611023  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

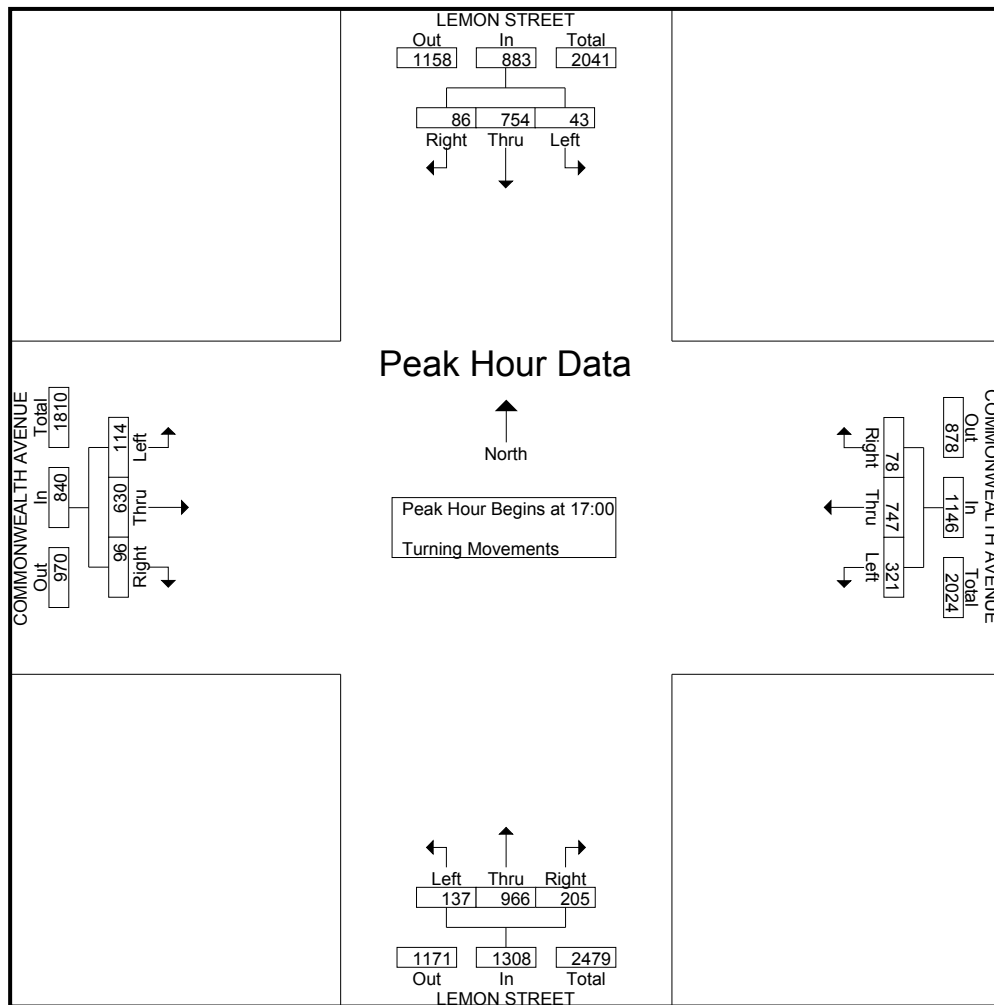
	HARBOR BOULEVARD Southbound				COMMONWEALTH AVENUE Westbound				HARBOR BOULEVARD Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	22	229	14	265	23	188	47	258	50	238	23	311	22	108	29	159	993
16:45	29	250	9	288	11	184	55	250	39	244	28	311	29	135	29	193	1042
17:00	24	247	6	277	19	174	61	254	44	242	24	310	23	158	29	210	1051
17:15	22	251	17	290	16	182	51	249	51	258	30	339	30	139	30	199	1077
Total Volume	97	977	46	1120	69	728	214	1011	184	982	105	1271	104	540	117	761	4163
% App. Total	8.7	87.2	4.1		6.8	72	21.2		14.5	77.3	8.3		13.7	71	15.4		
PHF	.836	.973	.676	.966	.750	.968	.877	.980	.902	.952	.875	.937	.867	.854	.975	.906	.966



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1611024  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

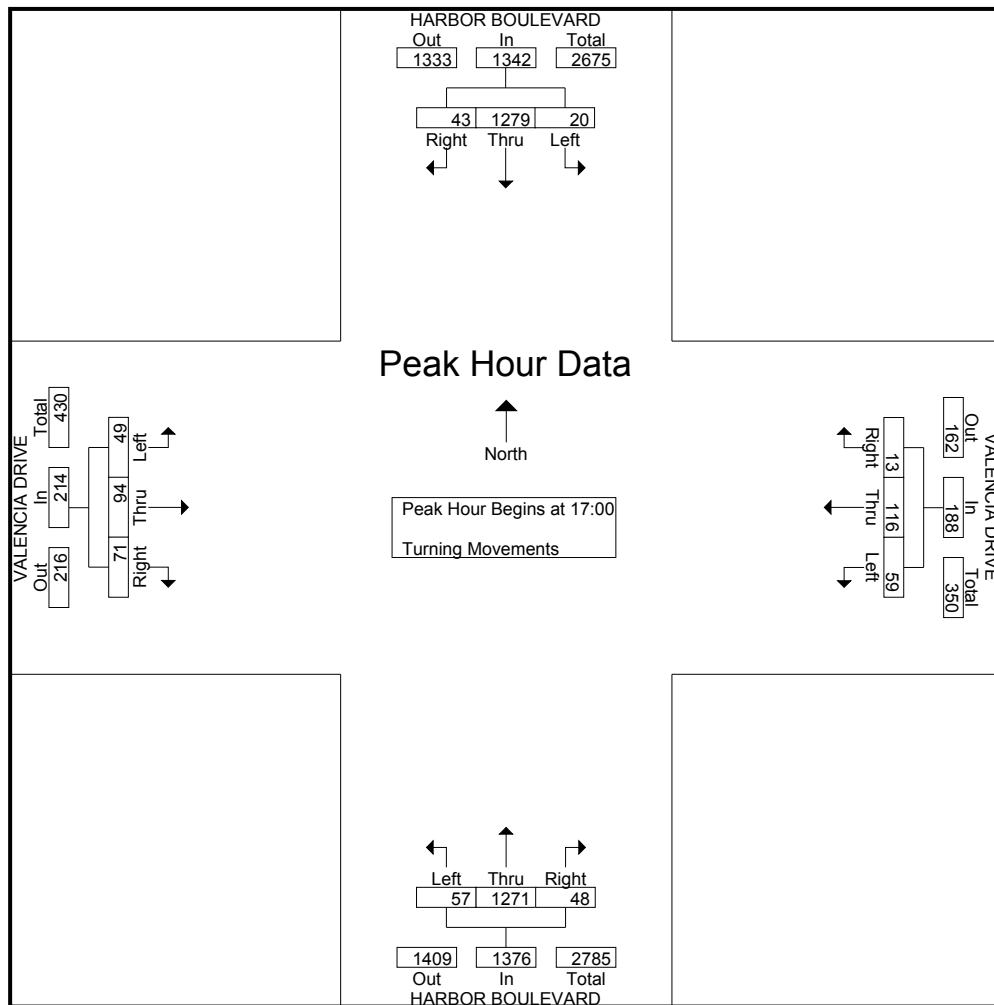
	LEMON STREET Southbound				COMMONWEALTH AVENUE Westbound				LEMON STREET Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	30	183	15	228	14	185	66	265	51	242	33	326	27	161	25	213	1032
17:15	11	210	13	234	21	203	89	313	49	260	28	337	29	158	26	213	1097
17:30	21	192	6	219	16	191	79	286	55	223	34	312	25	157	28	210	1027
17:45	24	169	9	202	27	168	87	282	50	241	42	333	15	154	35	204	1021
Total Volume	86	754	43	883	78	747	321	1146	205	966	137	1308	96	630	114	840	4177
% App. Total	9.7	85.4	4.9		6.8	65.2	28		15.7	73.9	10.5		11.4	75	13.6		
PHF	.717	.898	.717	.943	.722	.920	.902	.915	.932	.929	.815	.970	.828	.978	.814	.986	.952



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1611025  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

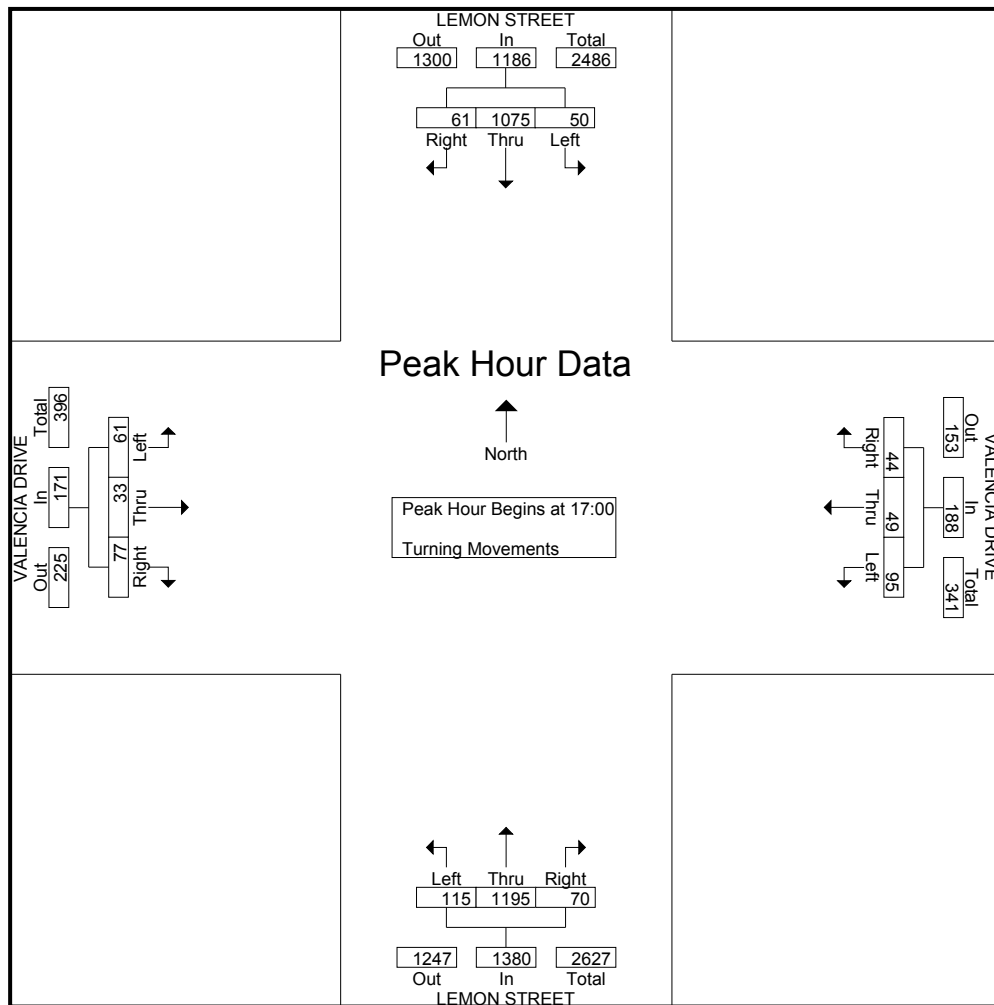
	HARBOR BOULEVARD Southbound				VALENCIA DRIVE Westbound				HARBOR BOULEVARD Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	9	335	5	349	1	25	18	44	15	331	9	355	18	26	9	53	801
17:15	16	342	4	362	5	31	17	53	13	318	9	340	14	23	11	48	803
17:30	7	297	4	308	4	26	13	43	10	296	17	323	22	27	16	65	739
17:45	11	305	7	323	3	34	11	48	10	326	22	358	17	18	13	48	777
Total Volume	43	1279	20	1342	13	116	59	188	48	1271	57	1376	71	94	49	214	3120
% App. Total	3.2	95.3	1.5		6.9	61.7	31.4		3.5	92.4	4.1		33.2	43.9	22.9		
PHF	.672	.935	.714	.927	.650	.853	.819	.887	.800	.960	.648	.961	.807	.870	.766	.823	.971



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA AVENUE

File Name : H1611026  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

	LEMON STREET Southbound				VALENCIA DRIVE Westbound				LEMON STREET Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	18	258	10	286	12	15	22	49	17	288	23	328	17	8	7	32	695
17:15	14	297	17	328	9	8	29	46	14	306	25	345	17	7	23	47	766
17:30	11	282	11	304	10	14	23	47	21	283	32	336	24	10	17	51	738
17:45	18	238	12	268	13	12	21	46	18	318	35	371	19	8	14	41	726
Total Volume	61	1075	50	1186	44	49	95	188	70	1195	115	1380	77	33	61	171	2925
% App. Total	5.1	90.6	4.2		23.4	26.1	50.5		5.1	86.6	8.3		45	19.3	35.7		
PHF	.847	.905	.735	.904	.846	.817	.819	.959	.833	.939	.821	.930	.802	.825	.663	.838	.955

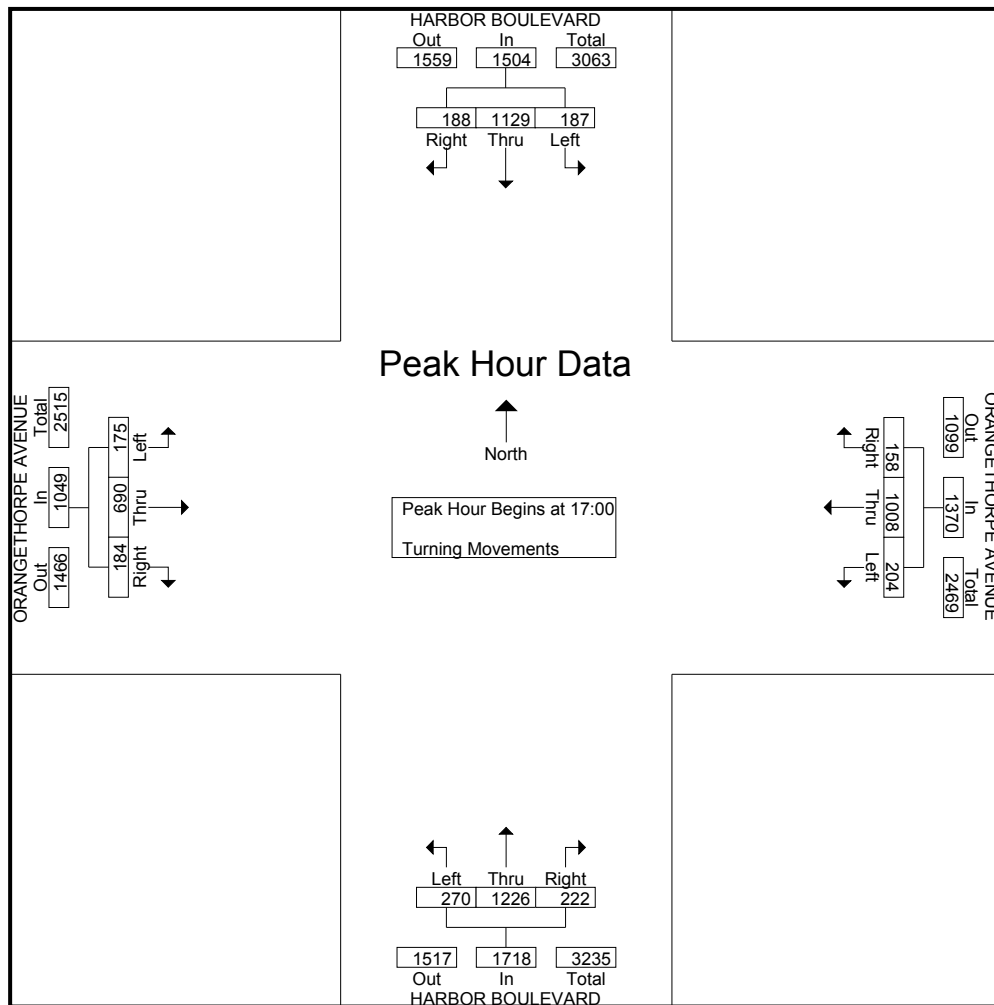




City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1611027  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

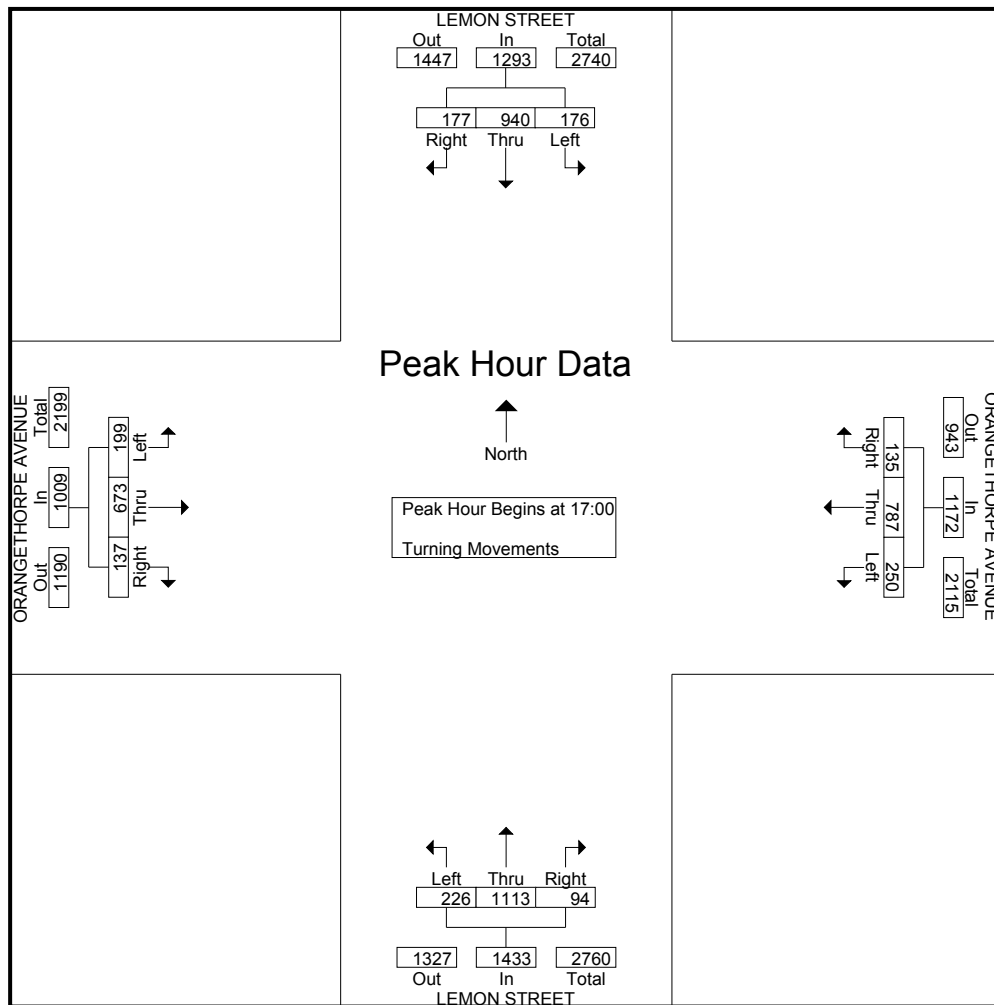
	HARBOR BOULEVARD Southbound				ORANGETHORPE AVENUE Westbound				HARBOR BOULEVARD Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	43	290	47	380	36	237	56	329	41	306	64	411	49	185	47	281	1401
17:15	50	287	43	380	31	252	53	336	56	313	73	442	42	157	39	238	1396
17:30	47	289	46	382	49	268	40	357	65	296	66	427	51	164	47	262	1428
17:45	48	263	51	362	42	251	55	348	60	311	67	438	42	184	42	268	1416
Total Volume	188	1129	187	1504	158	1008	204	1370	222	1226	270	1718	184	690	175	1049	5641
% App. Total	12.5	75.1	12.4		11.5	73.6	14.9		12.9	71.4	15.7		17.5	65.8	16.7		
PHF	.940	.973	.917	.984	.806	.940	.911	.959	.854	.979	.925	.972	.902	.932	.931	.933	.988



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1611028  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

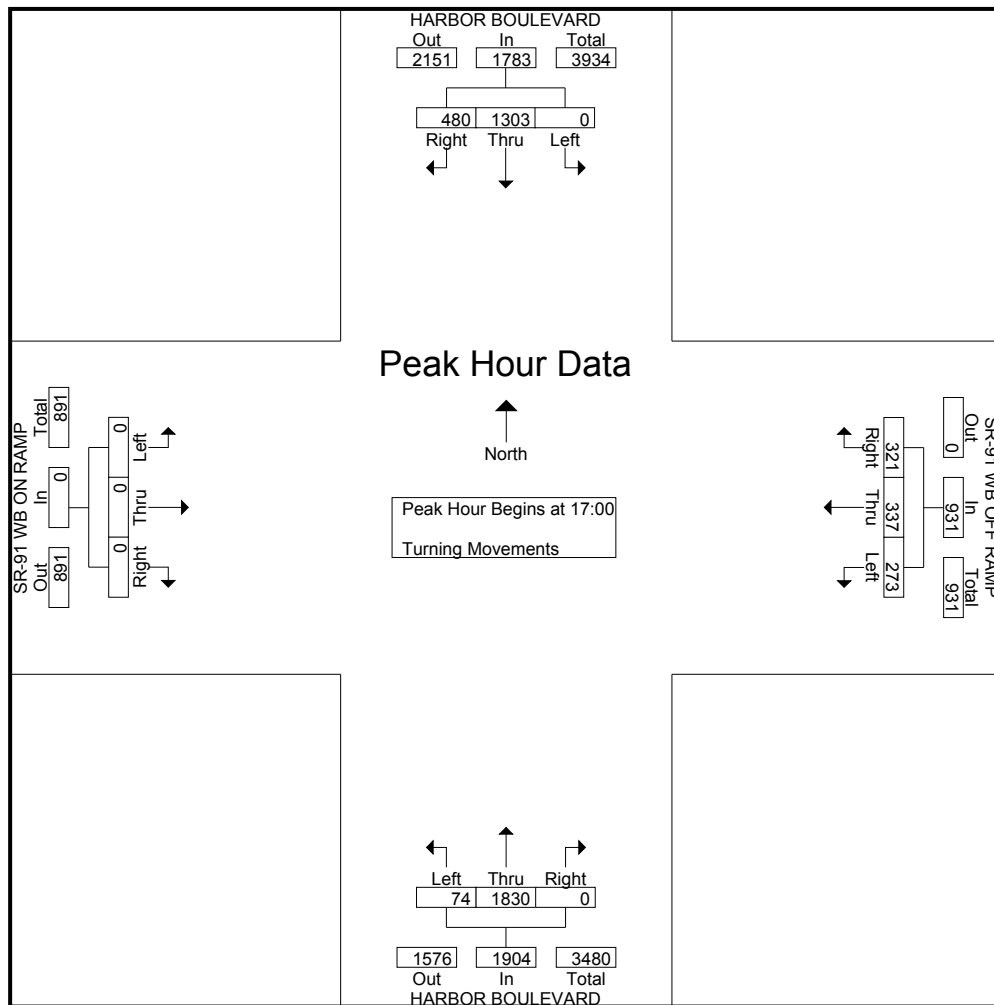
	LEMON STREET Southbound				ORANGETHORPE AVENUE Westbound				LEMON STREET Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	34	225	38	297	37	<b>200</b>	60	<b>297</b>	22	248	54	324	31	<b>180</b>	53	<b>264</b>	1182
17:15	<b>53</b>	241	41	335	29	194	<b>74</b>	297	24	288	54	366	38	171	48	257	<b>1255</b>
17:30	41	232	44	317	29	199	65	293	<b>26</b>	<b>296</b>	<b>62</b>	<b>384</b>	29	156	43	228	1222
17:45	49	<b>242</b>	<b>53</b>	<b>344</b>	<b>40</b>	194	51	285	22	281	56	359	<b>39</b>	166	<b>55</b>	260	1248
Total Volume	177	940	176	1293	135	787	250	1172	94	1113	226	1433	137	673	199	1009	4907
% App. Total	13.7	72.7	13.6		11.5	67.2	21.3		6.6	77.7	15.8		13.6	66.7	19.7		
PHF	.835	.971	.830	.940	.844	.984	.845	.987	.904	.940	.911	.933	.878	.935	.905	.955	.977



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : H1611029  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

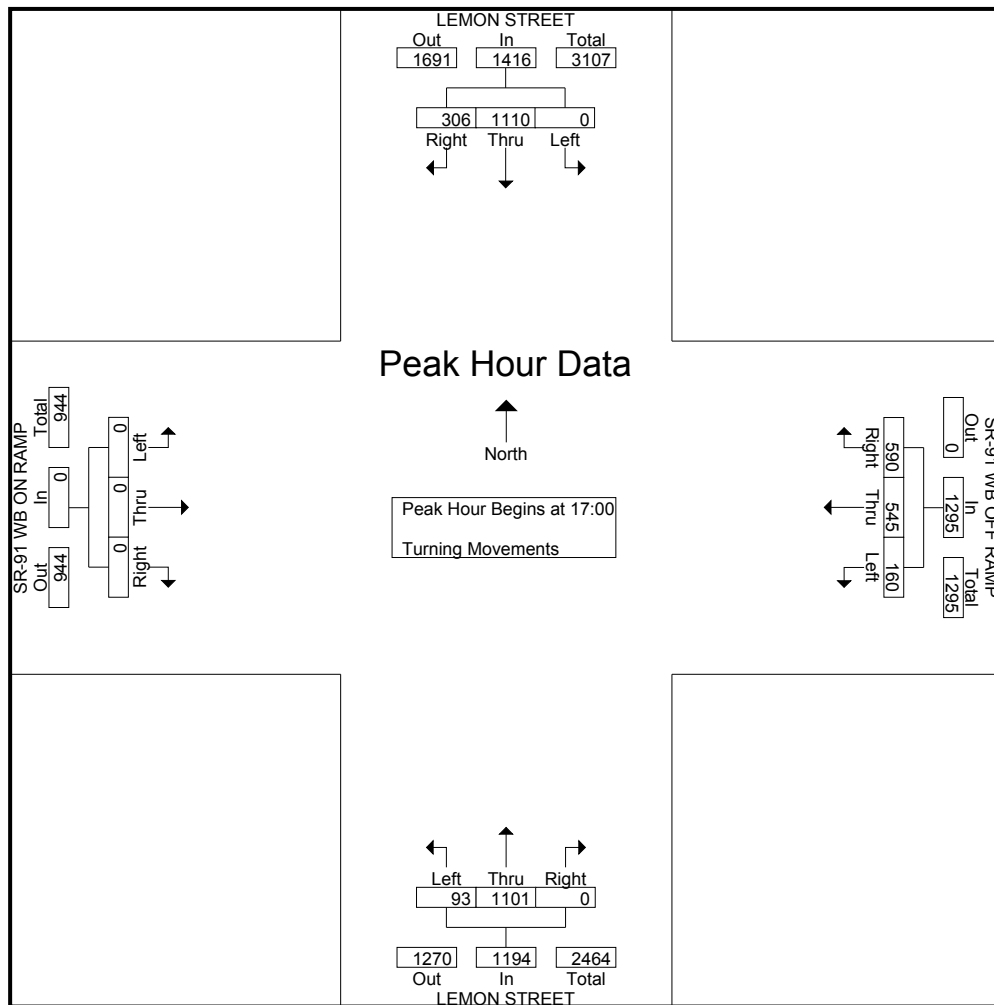
	HARBOR BOULEVARD Southbound				SR-91 WB OFF RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	133	318	0	451	73	78	58	209	0	453	22	475	0	0	0	0	1135
17:15	113	357	0	470	78	88	63	229	0	465	27	492	0	0	0	0	1191
17:30	122	351	0	473	75	86	71	232	0	480	10	490	0	0	0	0	1195
17:45	112	277	0	389	95	85	81	261	0	432	15	447	0	0	0	0	1097
Total Volume	480	1303	0	1783	321	337	273	931	0	1830	74	1904	0	0	0	0	4618
% App. Total	26.9	73.1	0		34.5	36.2	29.3		0	96.1	3.9		0	0	0		
PHF	.902	.912	.000	.942	.845	.957	.843	.892	.000	.953	.685	.967	.000	.000	.000	.000	.966



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1611030  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

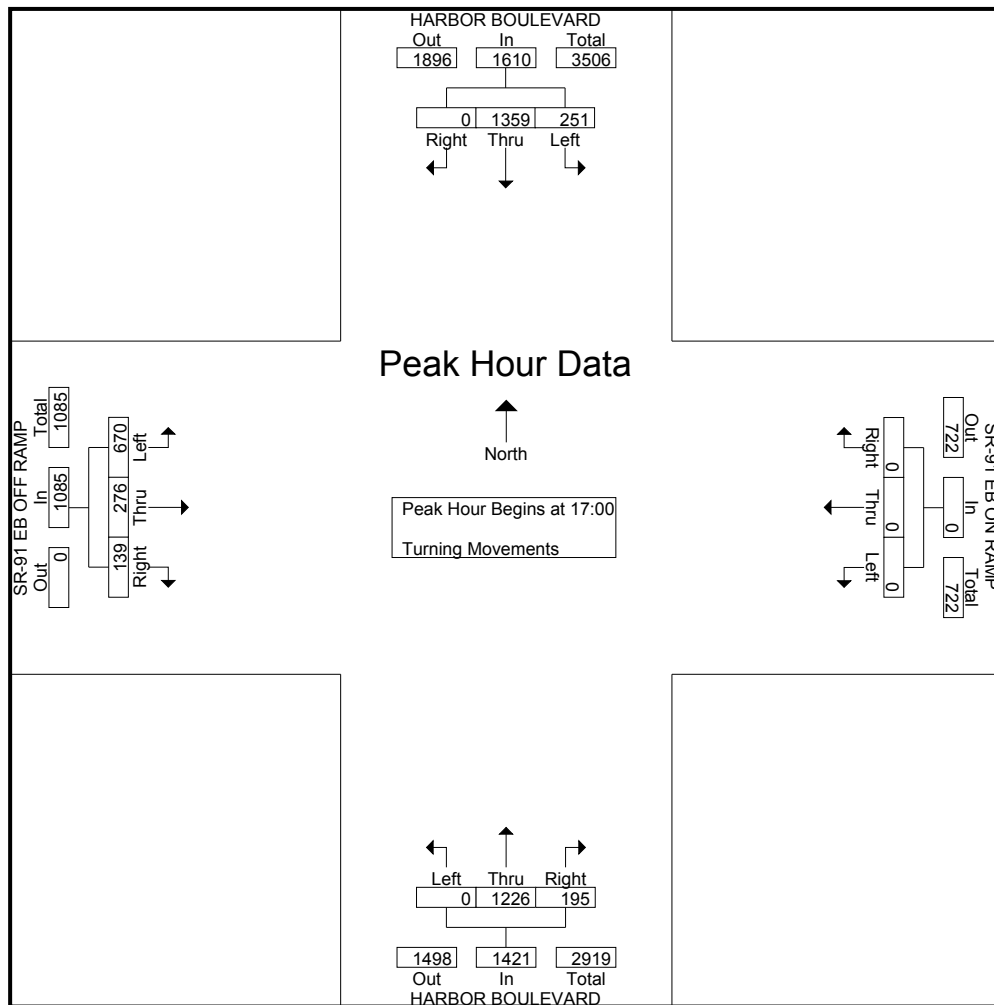
	LEMON STREET Southbound				SR-91 WB OFF RAMP Westbound				LEMON STREET Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	63	252	0	315	156	127	38	321	0	238	30	268	0	0	0	0	904
17:15	86	300	0	386	150	134	33	317	0	288	26	314	0	0	0	0	1017
17:30	77	263	0	340	142	132	48	322	0	307	18	325	0	0	0	0	987
17:45	80	295	0	375	142	152	41	335	0	268	19	287	0	0	0	0	997
Total Volume	306	1110	0	1416	590	545	160	1295	0	1101	93	1194	0	0	0	0	3905
% App. Total	21.6	78.4	0		45.6	42.1	12.4		0	92.2	7.8		0	0	0		
PHF	.890	.925	.000	.917	.946	.896	.833	.966	.000	.897	.775	.918	.000	.000	.000	.000	.960



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1611031  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

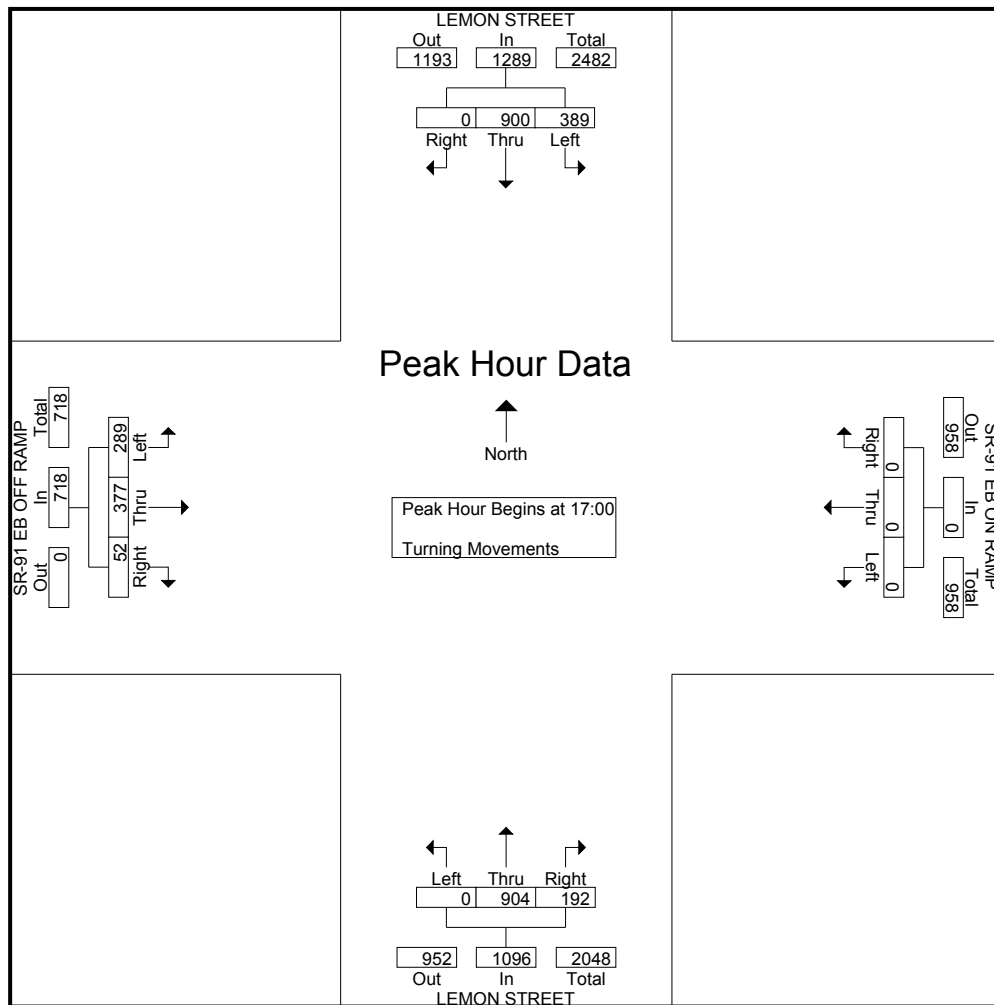
	HARBOR BOULEVARD Southbound				SR-91 EB ON RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	0	315	67	382	0	0	0	0	45	321	0	366	36	58	167	261	1009
17:15	0	363	64	427	0	0	0	0	62	325	0	387	39	71	172	282	1096
17:30	0	372	62	434	0	0	0	0	40	284	0	324	34	68	171	273	1031
17:45	0	309	58	367	0	0	0	0	48	296	0	344	30	79	160	269	980
Total Volume	0	1359	251	1610	0	0	0	0	195	1226	0	1421	139	276	670	1085	4116
% App. Total	0	84.4	15.6		0	0	0		13.7	86.3	0		12.8	25.4	61.8		
PHF	.000	.913	.937	.927	.000	.000	.000	.000	.786	.943	.000	.918	.891	.873	.974	.962	.939



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1611032  
Site Code : 00000000  
Start Date : 11/16/2016  
Page No : 3

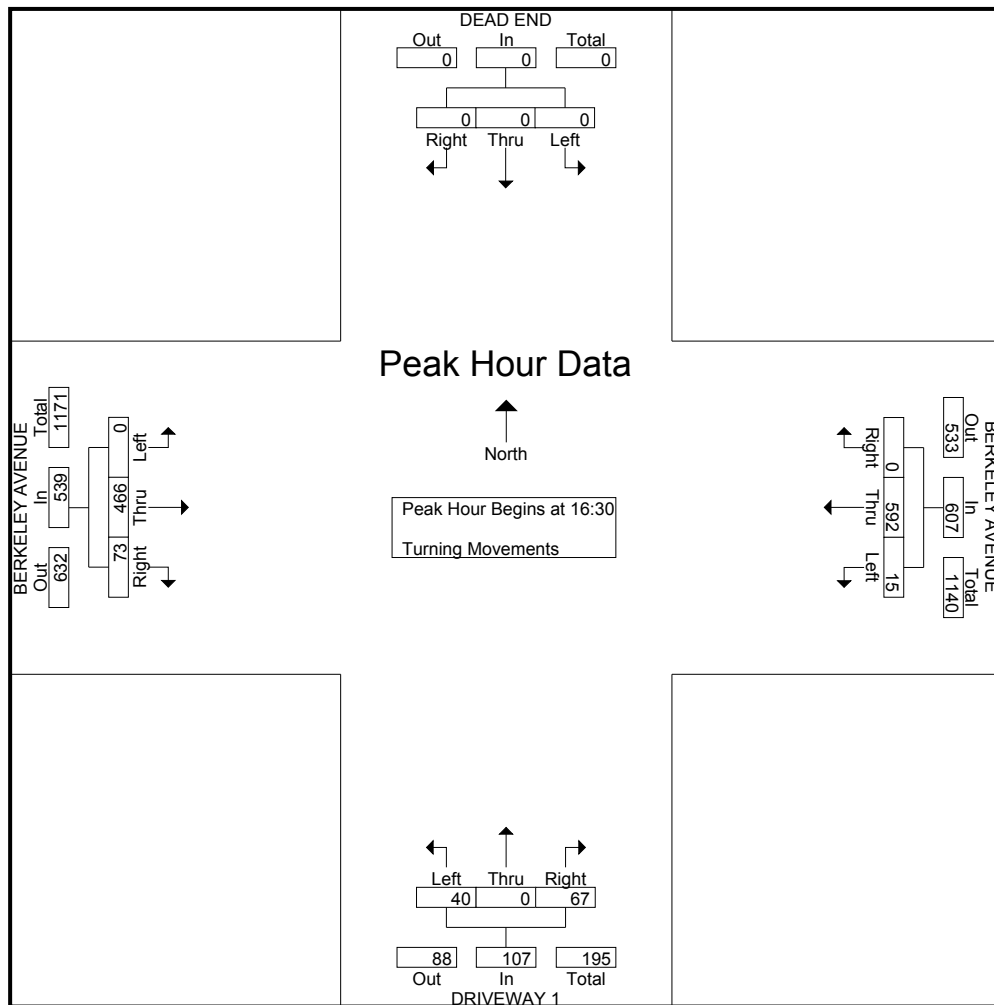
	LEMON STREET Southbound				SR-91 EB ON RAMP Westbound				LEMON STREET Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	0	221	88	309	0	0	0	0	59	202	0	261	10	93	67	170	740
17:15	0	229	95	324	0	0	0	0	51	246	0	297	18	106	72	196	817
17:30	0	215	105	320	0	0	0	0	40	240	0	280	7	92	74	173	773
17:45	0	235	101	336	0	0	0	0	42	216	0	258	17	86	76	179	773
Total Volume	0	900	389	1289	0	0	0	0	192	904	0	1096	52	377	289	718	3103
% App. Total	0	69.8	30.2		0	0	0		17.5	82.5	0		7.2	52.5	40.3		
PHF	.000	.957	.926	.959	.000	.000	.000	.000	.814	.919	.000	.923	.722	.889	.951	.916	.950



City: FULLERTON  
N-S Direction: COLLEGE DRIVEWAY 1  
E-W Direction: BERKELEY AVENUE

File Name : H1611015  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

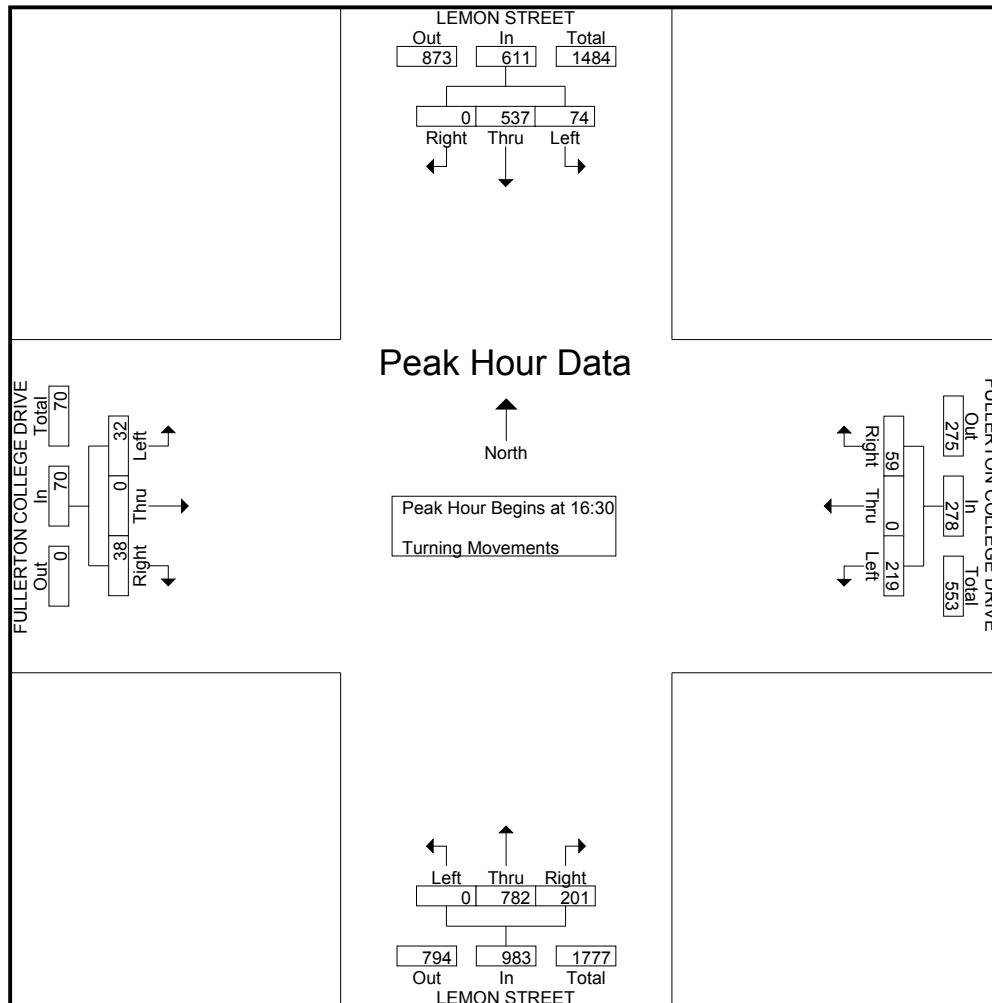
	DEAD END Southbound				BERKELEY AVENUE Westbound				DRIVEWAY 1 Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	0	0	0	0	156	1	157	15	0	16	31	16	121	0	137	325
16:45	0	0	0	0	0	127	4	131	13	0	11	24	11	100	0	111	266
17:00	0	0	0	0	0	159	3	162	19	0	4	23	23	125	0	148	333
17:15	0	0	0	0	0	150	7	157	20	0	9	29	23	120	0	143	329
Total Volume	0	0	0	0	0	592	15	607	67	0	40	107	73	466	0	539	1253
% App. Total	0	0	0	0	0	97.5	2.5		62.6	0	37.4		13.5	86.5	0		
PHF	.000	.000	.000	.000	.000	.931	.536	.937	.838	.000	.625	.863	.793	.932	.000	.910	.941



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: FULLERTON COLLEGE DRIVE

File Name : H1611013  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

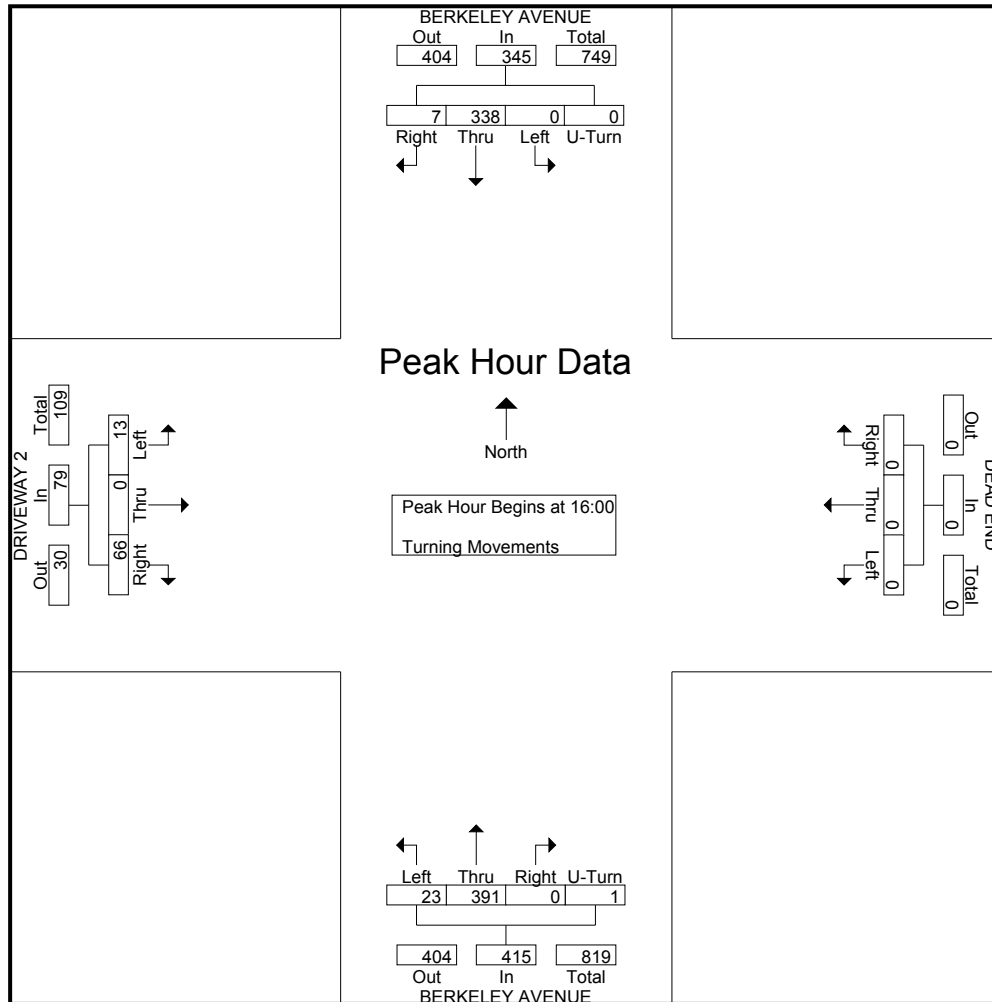
	LEMON STREET Southbound				FULLERTON COLLEGE DRIVE Westbound				LEMON STREET Northbound				FULLERTON COLLEGE DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	113	19	132	16	0	<b>70</b>	<b>86</b>	49	195	0	244	<b>19</b>	0	6	<b>25</b>	487
16:45	0	143	<b>21</b>	164	11	0	45	56	47	182	0	229	11	0	<b>13</b>	24	473
17:00	0	129	20	149	<b>18</b>	0	49	67	48	191	0	239	5	0	8	13	468
17:15	0	<b>152</b>	14	<b>166</b>	14	0	55	69	<b>57</b>	<b>214</b>	0	<b>271</b>	3	0	5	8	<b>514</b>
Total Volume	0	537	74	611	59	0	219	278	201	782	0	983	38	0	32	70	1942
% App. Total	0	87.9	12.1		21.2	0	78.8		20.4	79.6	0		54.3	0	45.7		
PHF	.000	.883	.881	.920	.819	.000	.782	.808	.882	.914	.000	.907	.500	.000	.615	.700	.945





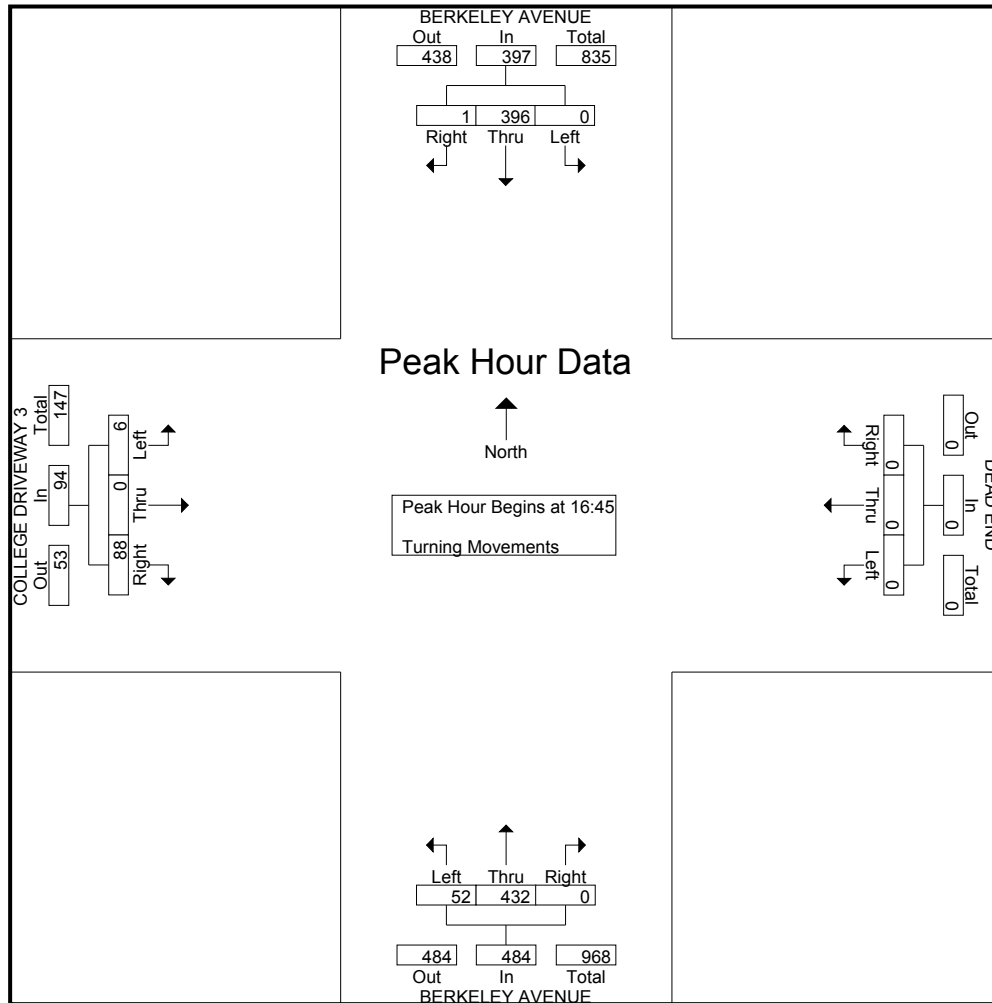
File Name : H1611016  
Site Code : 00001944  
Start Date : 11/15/2016  
Page No : 3

	BERKELEY AVENUE Southbound					DEAD END Westbound				BERKELEY AVENUE Northbound					DRIVEWAY 2 Eastbound				Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 16:00																			
16:00	4	84	0	0	88	0	0	0	0	0	78	3	0	81	18	0	5	23	192
16:15	2	86									10				19				227
16:30	1	85	0	0	86	0	0	0	0	0	94	7	0	101	15	0	1	16	203
16:45	0	83	0	0	83	0	0	0	0	0	113		1	117					
Total Volume	7	338	0	0	345	0	0	0	0	0	391	23	1	415	66	0	13	79	839
% App. Total	2	98	0	0		0	0	0		0	94.2	5.5	0.2		83.5	0	16.5		
PHF	.438	.983	.000	.000	.980	.000	.000	.000	.000	.000	.865	.575	.250	.887	.868	.000	.650	.859	.924



File Name : H1611017  
Site Code : 00005061  
Start Date : 11/15/2016  
Page No : 3

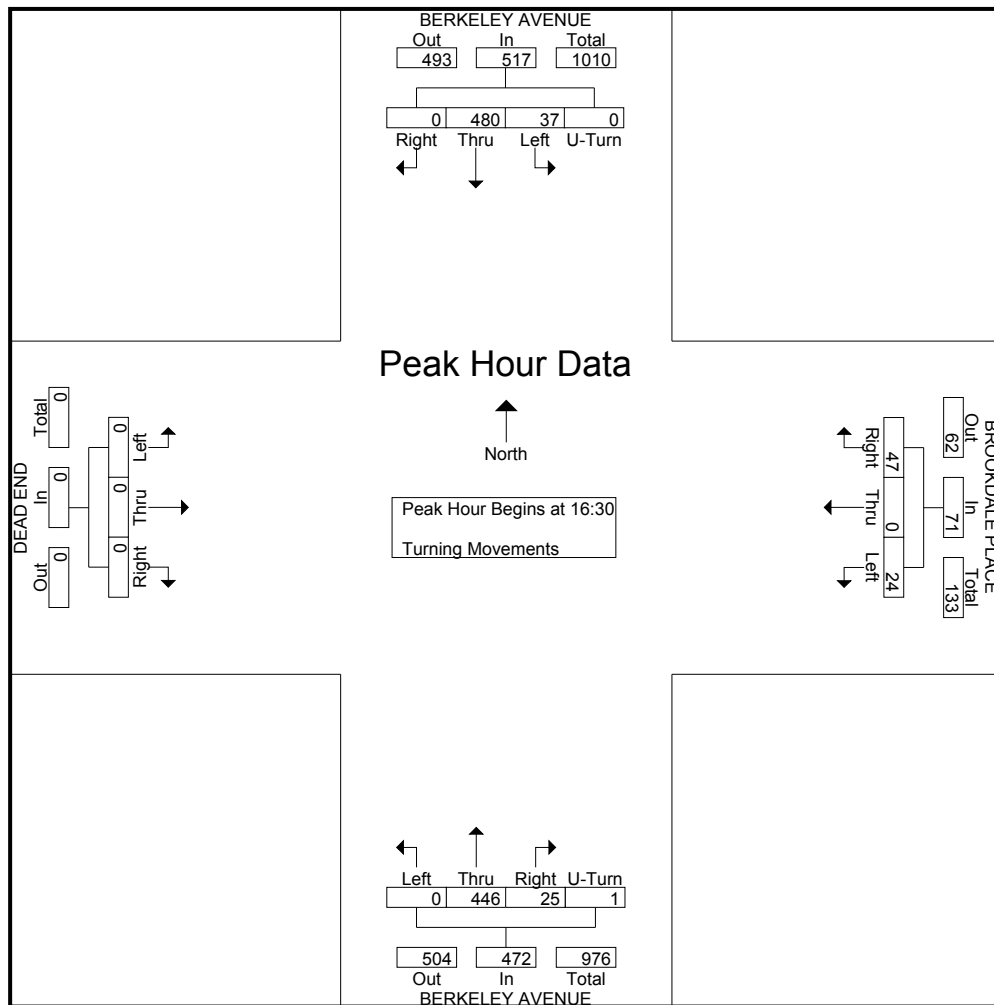
	BERKELEY AVENUE Southbound				DEAD END Westbound				BERKELEY AVENUE Northbound				COLLEGE DRIVEWAY 3 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	107	0	107	0	0	0	0	0	118	11	129	21	0	1	22	258
17:00	0	83	0	83	0	0	0	0	0	108	13	121	16	0	1	17	221
17:15	0	102	0	102	0	0	0	0	0	104	13	117	27	0	2	29	248
17:30	1	104	0	105	0	0	0	0	0	102	15	117	24	0	2	26	248
Total Volume	1	396	0	397	0	0	0	0	0	432	52	484	88	0	6	94	975
% App. Total	0.3	99.7	0		0	0	0		0	89.3	10.7		93.6	0	6.4		
PHF	.250	.925	.000	.928	.000	.000	.000	.000	.000	.915	.867	.938	.815	.000	.750	.810	.945



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: BROOKDALE PLACE

File Name : h1611018  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

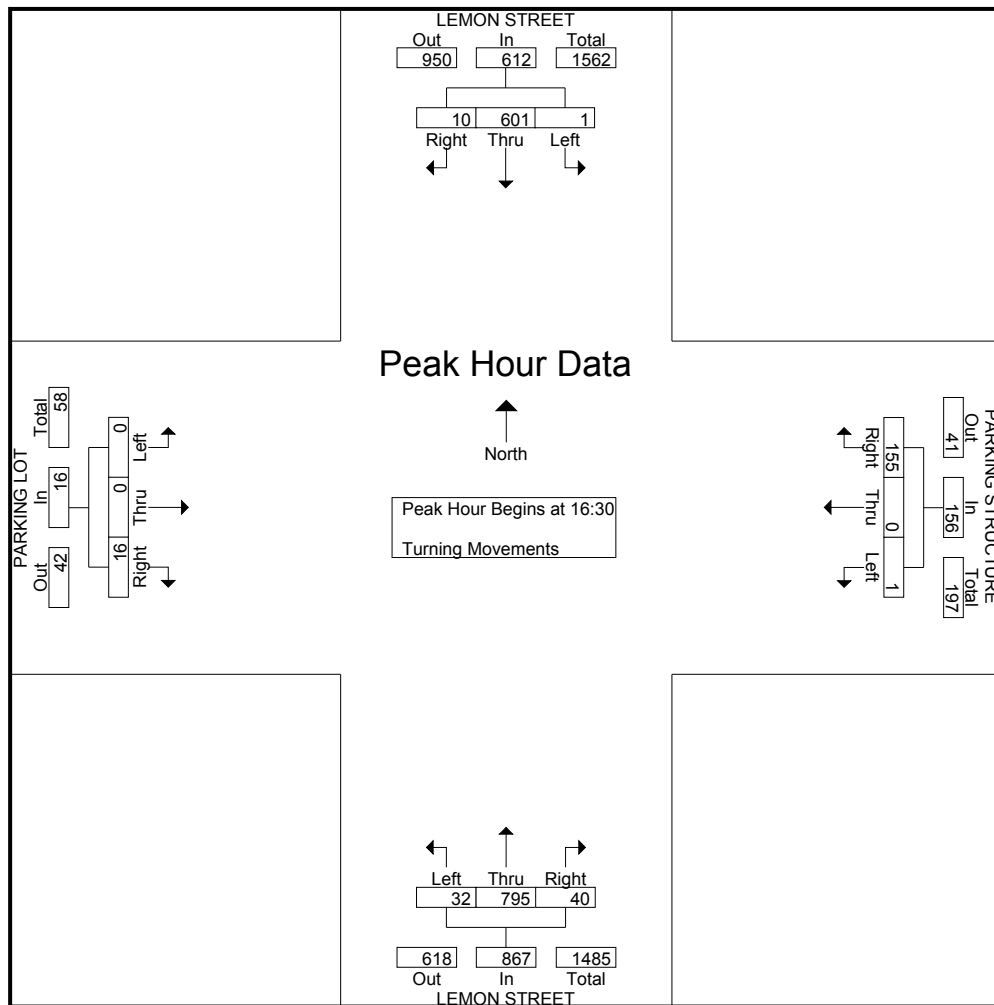
	BERKELEY AVENUE Southbound					BROOKDALE PLACE Westbound				BERKELEY AVENUE Northbound					DEAD END Eastbound				
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 16:30																			
16:30	0	120	9	0	129	10	0	4	14	6	121	0	0	127	0	0	0	0	270
16:45	0	104	9	0	113	11	0	7	18	4	108	0	0	112	0	0	0	0	243
17:00	0	120	7	0	127	15	0	8	23	4	96	0	0	100	0	0	0	0	250
17:15	0	136	12	0	148	11	0	5	16	11		1	133		0	0	0	0	297
Total Volume	0	480	37	0	517	47	0	24	71	25	446	0	1	472	0	0	0	0	1060
% App. Total	0	92.8	7.2	0		66.2	0	33.8		5.3	94.5	0	0.2		0	0	0		
PHF	.000	.882	.771	.000	.873	.783	.000	.750	.772	.568	.921	.000	.250	.887	.000	.000	.000	.000	.892



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: PARKING STRUCTURE

File Name : H1611014  
Site Code : 00000000  
Start Date : 11/15/2016  
Page No : 3

	LEMON STREET Southbound				PARKING STRUCTURE Westbound				LEMON STREET Northbound				PARKING LOT Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	1	131	0	132	63	0	0	63	12	190	15	217	7	0	0	7	419
16:45	5	165	0	170	25	0	1	26	5	191	9	205	2	0	0	2	403
17:00	3	149	1	153	25	0	0	25	12	202	6	220	1	0	0	1	399
17:15	1	156	0	157	42	0	0	42	11	212	2	225	6	0	0	6	430
Total Volume	10	601	1	612	155	0	1	156	40	795	32	867	16	0	0	16	1651
% App. Total	1.6	98.2	0.2		99.4	0	0.6		4.6	91.7	3.7		100	0	0		
PHF	.500	.911	.250	.900	.615	.000	.250	.619	.833	.938	.533	.963	.571	.000	.000	.571	.960



*APPENDIX A-II*

**SATURDAY ARRIVAL AND DEPARTURE PEAK HOUR  
INTERSECTION COUNTS**

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1711024  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

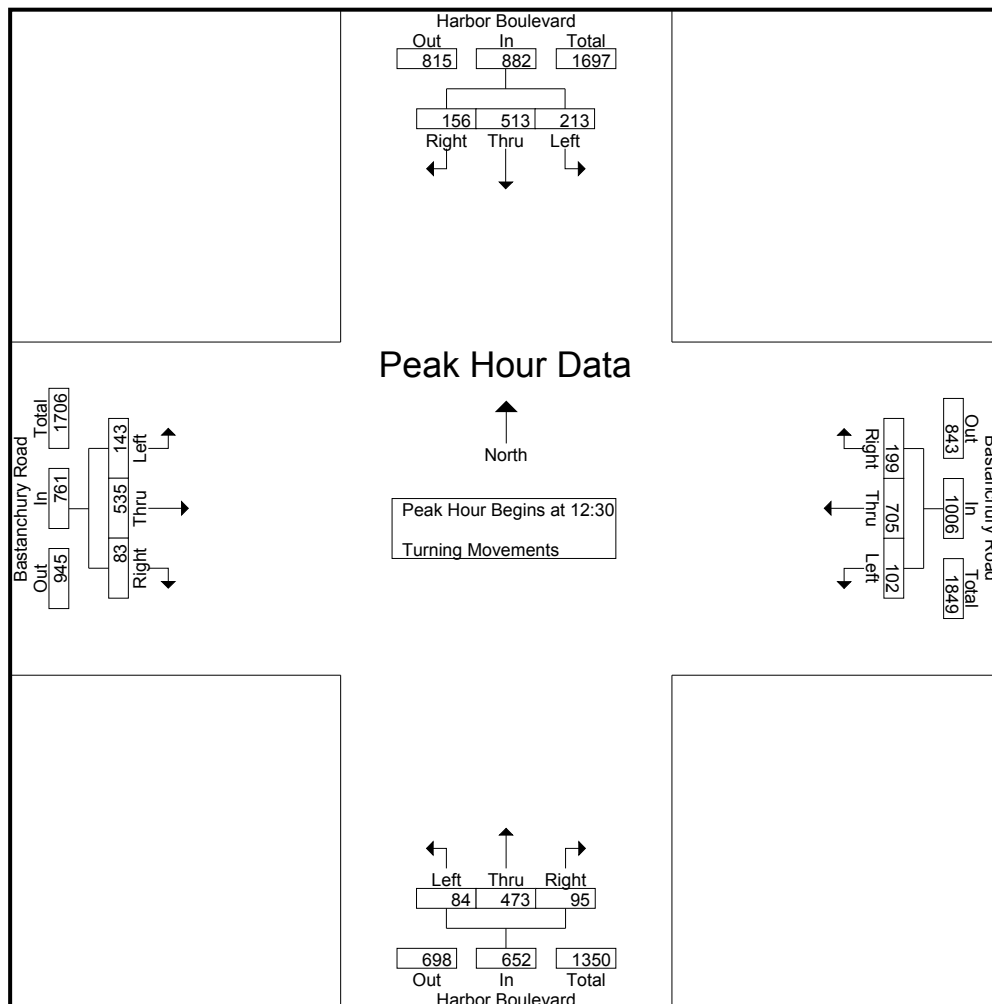
Groups Printed- Turning Movements

	Harbor Boulevard Southbound			Bastanchury Road Westbound			Harbor Boulevard Northbound			Bastanchury Road Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	38	113	34	32	113	19	35	147	33	17	134	41	756
12:15	42	119	43	35	120	21	30	107	29	14	152	39	751
12:30	29	120	56	49	131	22	29	116	20	17	140	36	765
12:45	47	126	63	59	194	36	23	110	13	15	156	43	885
Total	156	478	196	175	558	98	117	480	95	63	582	159	3157
13:00	41	128	50	50	199	18	15	119	28	19	98	34	799
13:15	39	139	44	41	181	26	28	128	23	32	141	30	852
13:30	43	99	41	38	157	22	20	126	17	12	138	48	761
13:45	36	144	57	44	158	23	25	159	23	25	147	39	880
Total	159	510	192	173	695	89	88	532	91	88	524	151	3292
15:30	26	113	41	48	155	45	15	134	21	22	146	40	806
15:45	41	118	42	39	155	38	15	130	18	29	160	36	821
Total	67	231	83	87	310	83	30	264	39	51	306	76	1627
16:00	41	118	32	30	157	28	19	125	20	10	138	45	763
16:15	41	114	42	33	152	22	16	124	34	17	158	25	778
16:30	42	123	41	48	148	21	16	118	27	18	153	41	796
16:45	40	134	51	47	163	17	19	123	33	18	140	39	824
Total	164	489	166	158	620	88	70	490	114	63	589	150	3161
17:00	42	107	45	29	175	18	16	111	32	15	128	28	746
17:15	35	115	42	43	143	21	18	115	24	14	128	25	723
Grand Total	623	1930	724	665	2501	397	339	1992	395	294	2257	589	12706
Apprch %	19	58.9	22.1	18.7	70.2	11.1	12.4	73.1	14.5	9.4	71.9	18.8	
Total %	4.9	15.2	5.7	5.2	19.7	3.1	2.7	15.7	3.1	2.3	17.8	4.6	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1711024  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

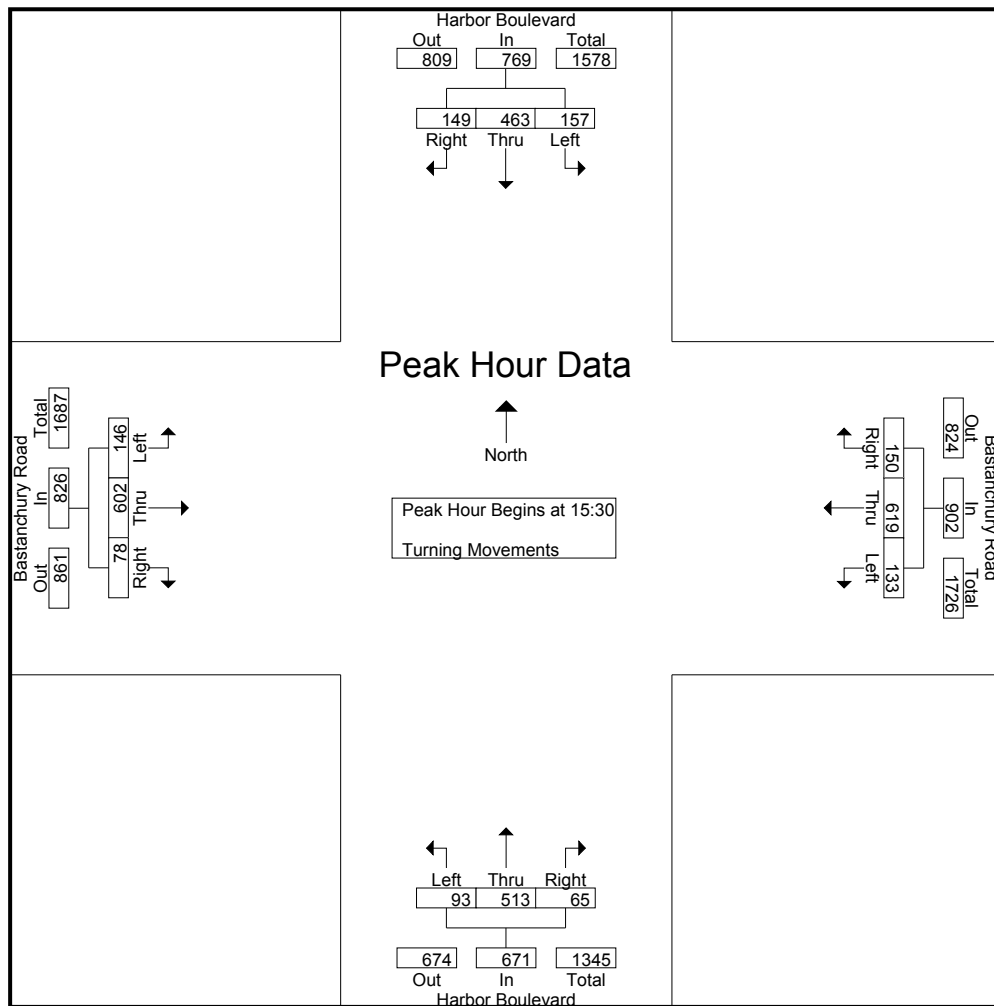
	Harbor Boulevard Southbound				Bastanchury Road Westbound				Harbor Boulevard Northbound				Bastanchury Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30																	
12:30	29	120	56	205	49	131	22	202	29	116	20	165	17	140	36	193	765
12:45	47	126	63	236	59	194	36	289	23	110	13	146	15	156	43	214	885
13:00	41	128	50	219	50	199	18	267	15	119	28	162	19	98	34	151	799
13:15	39	139	44	222	41	181	26	248	28	128	23	179	32	141	30	203	852
Total Volume	156	513	213	882	199	705	102	1006	95	473	84	652	83	535	143	761	3301
% App. Total	17.7	58.2	24.1		19.8	70.1	10.1		14.6	72.5	12.9		10.9	70.3	18.8		
PHF	.830	.923	.845	.934	.843	.886	.708	.870	.819	.924	.750	.911	.648	.857	.831	.889	.932



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1711024  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Harbor Boulevard Southbound				Bastanchury Road Westbound				Harbor Boulevard Northbound				Bastanchury Road Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	26	113	41	180	48	155	45	248	15	134	21	170	22	146	40	208	806
15:45	41	118	42	201	39	155	38	232	15	130	18	163	29	160	36	225	821
16:00	41	118	32	191	30	157	28	215	19	125	20	164	10	138	45	193	763
16:15	41	114	42	197	33	152	22	207	16	124	34	174	17	158	25	200	778
Total Volume	149	463	157	769	150	619	133	902	65	513	93	671	78	602	146	826	3168
% App. Total	19.4	60.2	20.4		16.6	68.6	14.7		9.7	76.5	13.9		9.4	72.9	17.7		
PHF	.909	.981	.935	.956	.781	.986	.739	.909	.855	.957	.684	.964	.672	.941	.811	.918	.965





City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW-BREA BLVD

File Name : H1711025  
Site Code : 00003874  
Start Date : 11/4/2017  
Page No : 1

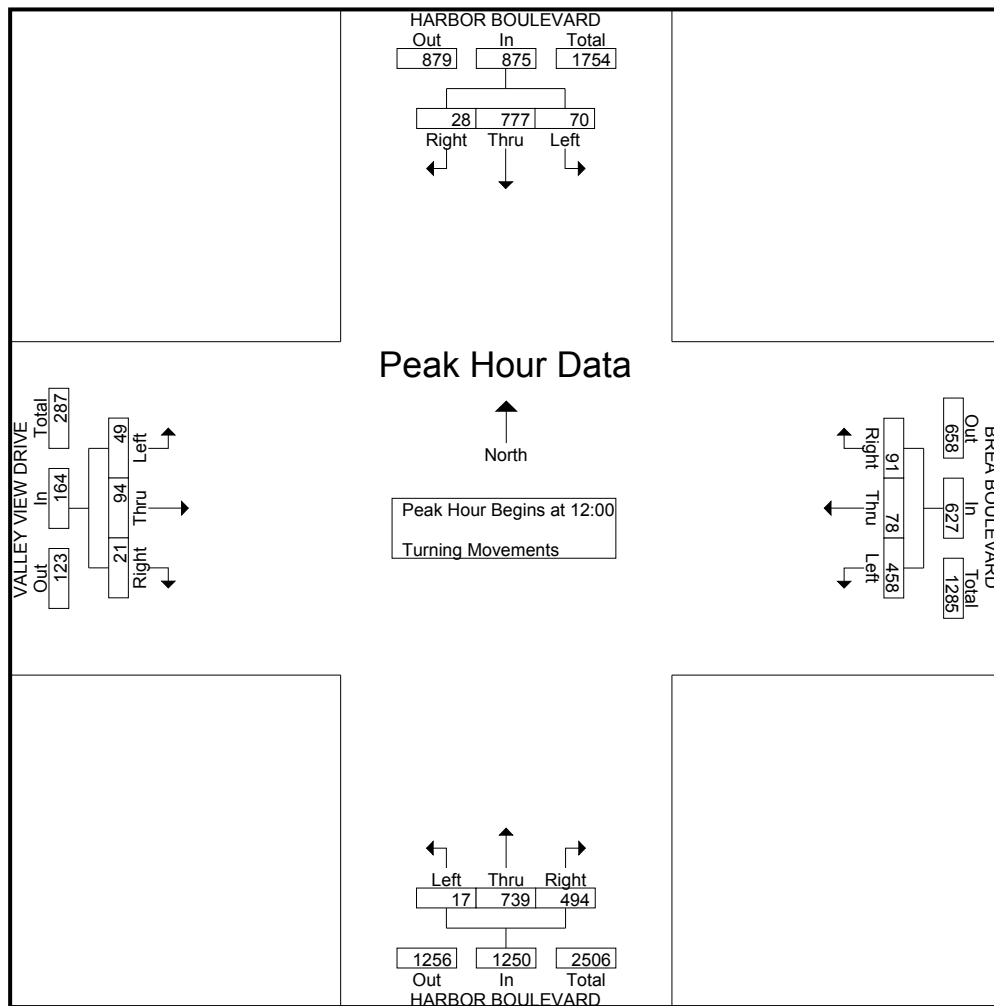
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			BREA BOULEVARD Westbound			HARBOR BOULEVARD Northbound			VALLEY VIEW DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	11	194	24	23	27	116	134	189	3	10	29	14	774
12:15	5	202	11	22	23	117	117	162	3	1	22	13	698
12:30	7	218	17	24	16	103	129	209	5	4	20	8	760
12:45	5	163	18	22	12	122	114	179	6	6	23	14	684
Total	28	777	70	91	78	458	494	739	17	21	94	49	2916
13:00	7	200	20	16	18	107	113	176	6	6	19	10	698
13:15	6	212	10	11	27	117	103	198	7	1	26	12	730
13:30	8	177	18	28	22	135	89	169	2	2	21	16	687
13:45	9	214	15	17	20	134	107	172	2	7	28	7	732
Total	30	803	63	72	87	493	412	715	17	16	94	45	2847
*** BREAK ***													
15:30	6	158	15	17	19	149	110	146	5	6	27	8	666
15:45	8	162	6	12	18	106	111	157	4	4	18	7	613
Total	14	320	21	29	37	255	221	303	9	10	45	15	1279
16:00	6	171	14	20	17	77	134	141	4	4	22	9	619
16:15	5	139	10	23	21	104	127	159	4	2	13	10	617
16:30	3	162	7	17	17	103	126	144	2	3	19	7	610
16:45	6	173	14	17	18	126	124	149	7	2	22	6	664
Total	20	645	45	77	73	410	511	593	17	11	76	32	2510
17:00	1	165	12	17	9	132	118	151	3	5	20	9	642
17:15	9	161	14	6	19	123	125	160	5	3	24	10	659
Grand Total	102	2871	225	292	303	1871	1881	2661	68	66	353	160	10853
Apprch %	3.2	89.8	7	11.8	12.3	75.9	40.8	57.7	1.5	11.4	61	27.6	
Total %	0.9	26.5	2.1	2.7	2.8	17.2	17.3	24.5	0.6	0.6	3.3	1.5	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW-BREA BLVD

File Name : H1711025  
Site Code : 00003874  
Start Date : 11/4/2017  
Page No : 2

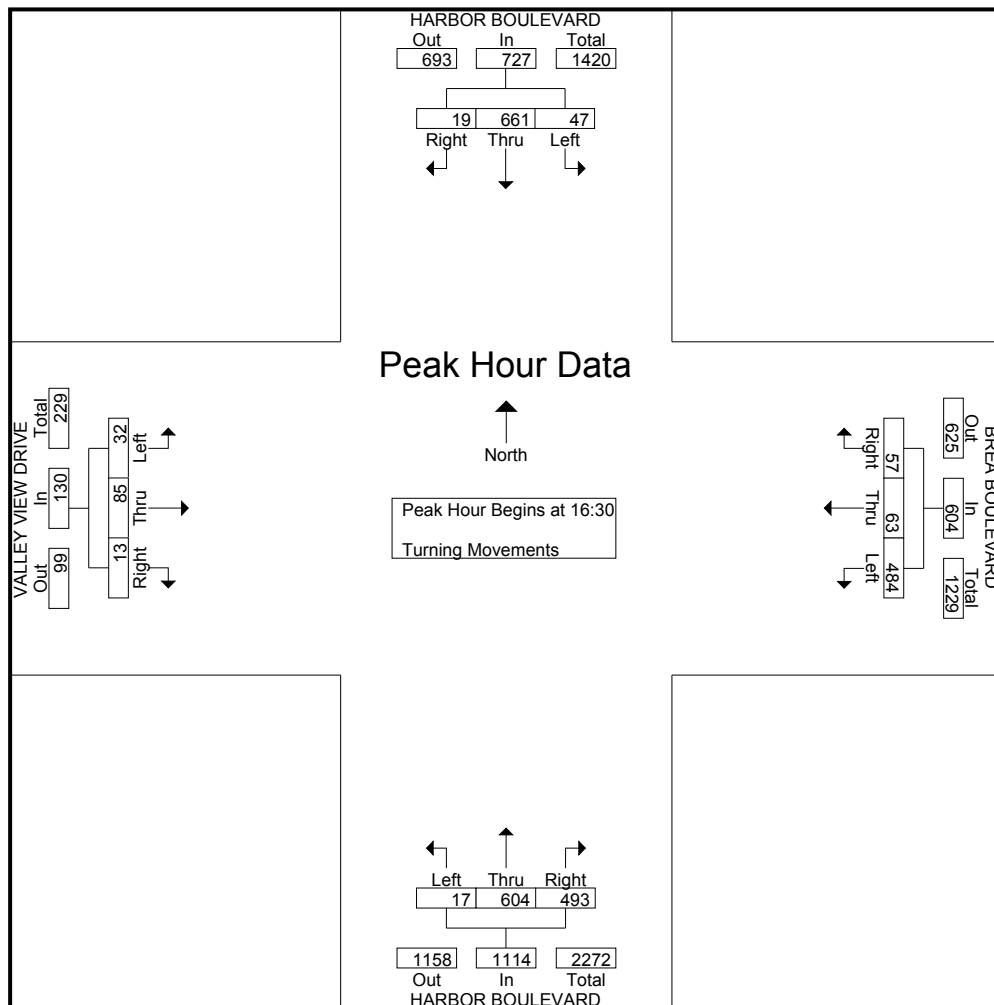
	HARBOR BOULEVARD Southbound				BREA BOULEVARD Westbound				HARBOR BOULEVARD Northbound				VALLEY VIEW DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	11	194	24	229	23	27	116	166	134	189	3	326	10	29	14	53	774
12:15	5	202	11	218	22	23	117	162	117	162	3	282	1	22	13	36	698
12:30	7	218	17	242	24	16	103	143	129	209	5	343	4	20	8	32	760
12:45	5	163	18	186	22	12	122	156	114	179	6	299	6	23	14	43	684
Total Volume	28	777	70	875	91	78	458	627	494	739	17	1250	21	94	49	164	2916
% App. Total	3.2	88.8	8		14.5	12.4	73		39.5	59.1	1.4		12.8	57.3	29.9		
PHF	.636	.891	.729	.904	.948	.722	.939	.944	.922	.884	.708	.911	.525	.810	.875	.774	.942



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW-BREA BLVD

File Name : H1711025  
Site Code : 00003874  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				BREA BOULEVARD Westbound				HARBOR BOULEVARD Northbound				VALLEY VIEW DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	3	162	7	172	17	17	103	137	126	144	2	272	3	19	7	29	610
16:45	6	173	14	193	17	18	126	161	124	149	7	280	2	22	6	30	664
17:00	1	165	12	178	17	9	132	158	118	151	3	272	5	20	9	34	642
17:15	9	161	14	184	6	19	123	148	125	160	5	290	3	24	10	37	659
Total Volume	19	661	47	727	57	63	484	604	493	604	17	1114	13	85	32	130	2575
% App. Total	2.6	90.9	6.5		9.4	10.4	80.1		44.3	54.2	1.5		10	65.4	24.6		
PHF	.528	.955	.839	.942	.838	.829	.917	.938	.978	.944	.607	.960	.650	.885	.800	.878	.970



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1711026  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

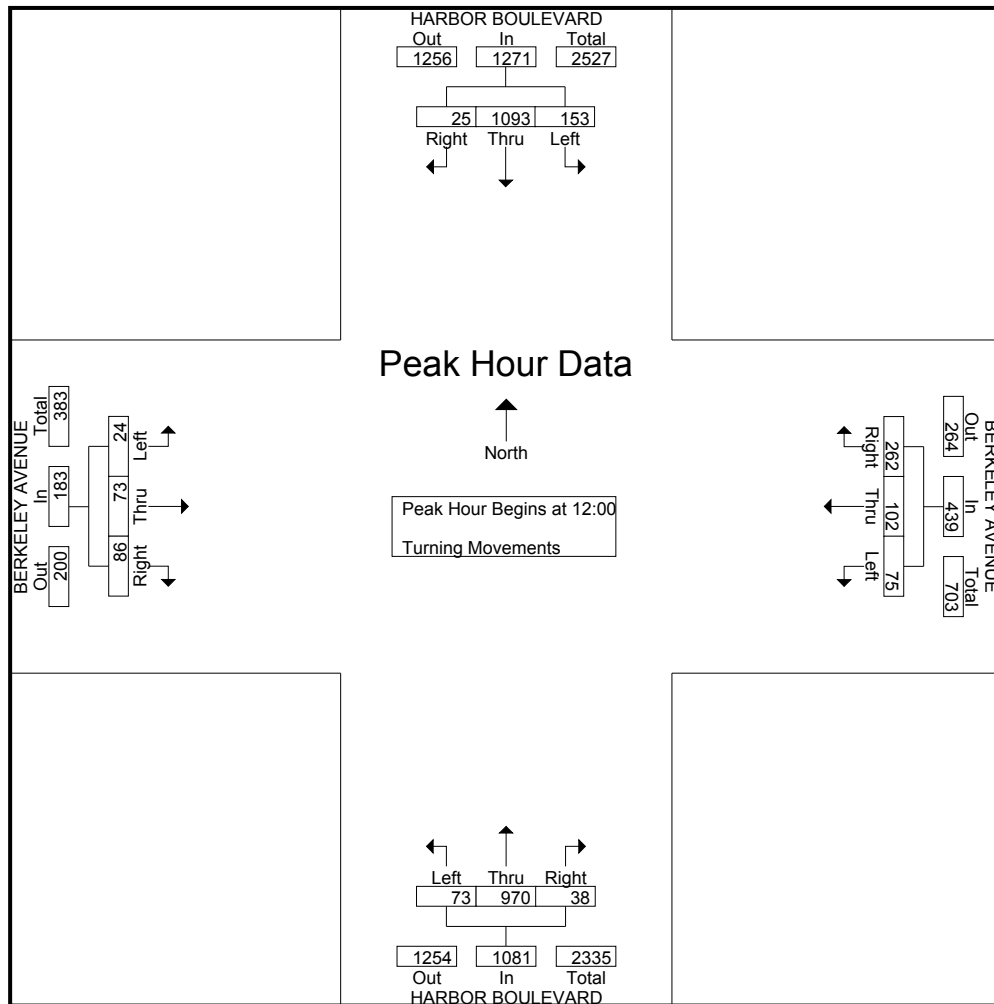
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			BERKELEY AVENUE Westbound			HARBOR BOULEVARD Northbound			BERKELEY AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	13	282	33	66	25	14	7	266	21	21	10	9	767
12:15	5	303	36	69	24	28	5	207	17	17	18	7	736
12:30	2	263	43	63	26	19	16	270	18	27	27	3	777
12:45	5	245	41	64	27	14	10	227	17	21	18	5	694
Total	25	1093	153	262	102	75	38	970	73	86	73	24	2974
13:00	4	281	31	59	29	13	6	238	18	14	13	5	711
13:15	7	272	48	50	15	15	11	245	19	16	13	9	720
13:30	9	298	30	52	16	8	8	223	13	14	5	9	685
13:45	14	279	50	56	19	10	10	229	14	22	18	9	730
Total	34	1130	159	217	79	46	35	935	64	66	49	32	2846
*** BREAK ***													
15:30	4	254	34	52	19	7	7	235	13	19	11	8	663
15:45	0	241	33	38	17	6	11	239	19	10	11	5	630
Total	4	495	67	90	36	13	18	474	32	29	22	13	1293
16:00	3	229	30	50	24	9	13	247	12	9	18	7	651
16:15	1	215	35	51	20	19	7	238	17	8	19	4	634
16:30	7	271	31	43	20	9	8	217	19	19	14	6	664
16:45	3	268	22	41	14	9	10	222	15	14	14	10	642
Total	14	983	118	185	78	46	38	924	63	50	65	27	2591
17:00	2	268	27	41	24	10	6	250	12	16	15	7	678
17:15	2	255	41	52	22	11	8	232	16	14	19	7	679
Grand Total	81	4224	565	847	341	201	143	3785	260	261	243	110	11061
Apprch %	1.7	86.7	11.6	61	24.6	14.5	3.4	90.4	6.2	42.5	39.6	17.9	
Total %	0.7	38.2	5.1	7.7	3.1	1.8	1.3	34.2	2.4	2.4	2.2	1	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1711026  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

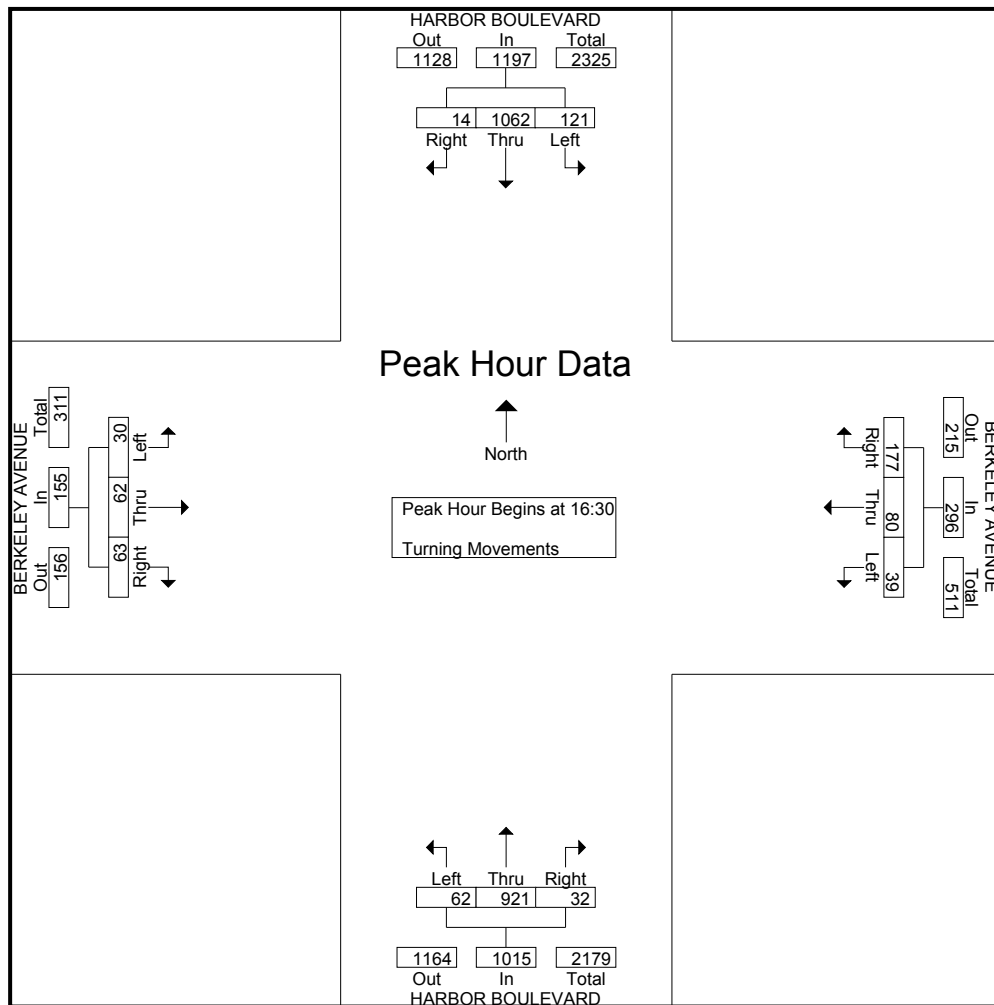
	HARBOR BOULEVARD Southbound				BERKELEY AVENUE Westbound				HARBOR BOULEVARD Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	13	282	33	328	66	25	14	105	7	266	21	294	21	10	9	40	767
12:15	5	303	36	344	69	24	28	121	5	207	17	229	17	18	7	42	736
12:30	2	263	43	308	63	26	19	108	16	270	18	304	27	27	3	57	777
12:45	5	245	41	291	64	27	14	105	10	227	17	254	21	18	5	44	694
Total Volume	25	1093	153	1271	262	102	75	439	38	970	73	1081	86	73	24	183	2974
% App. Total	2	86	12		59.7	23.2	17.1		3.5	89.7	6.8		47	39.9	13.1		
PHF	.481	.902	.890	.924	.949	.944	.670	.907	.594	.898	.869	.889	.796	.676	.667	.803	.957



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1711026  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				BERKELEY AVENUE Westbound				HARBOR BOULEVARD Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	7	271	31	309	43	20	9	72	8	217	19	244	19	14	6	39	664
16:45	3	268	22	293	41	14	9	64	10	222	15	247	14	14	10	38	642
17:00	2	268	27	297	41	24	10	75	6	250	12	268	16	15	7	38	678
17:15	2	255	41	298	52	22	11	85	8	232	16	256	14	19	7	40	679
Total Volume	14	1062	121	1197	177	80	39	296	32	921	62	1015	63	62	30	155	2663
% App. Total	1.2	88.7	10.1		59.8	27	13.2		3.2	90.7	6.1		40.6	40	19.4		
PHF	.500	.980	.738	.968	.851	.833	.886	.871	.800	.921	.816	.947	.829	.816	.750	.969	.980



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: BERKELEY AVENUE

File Name : H1711027  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

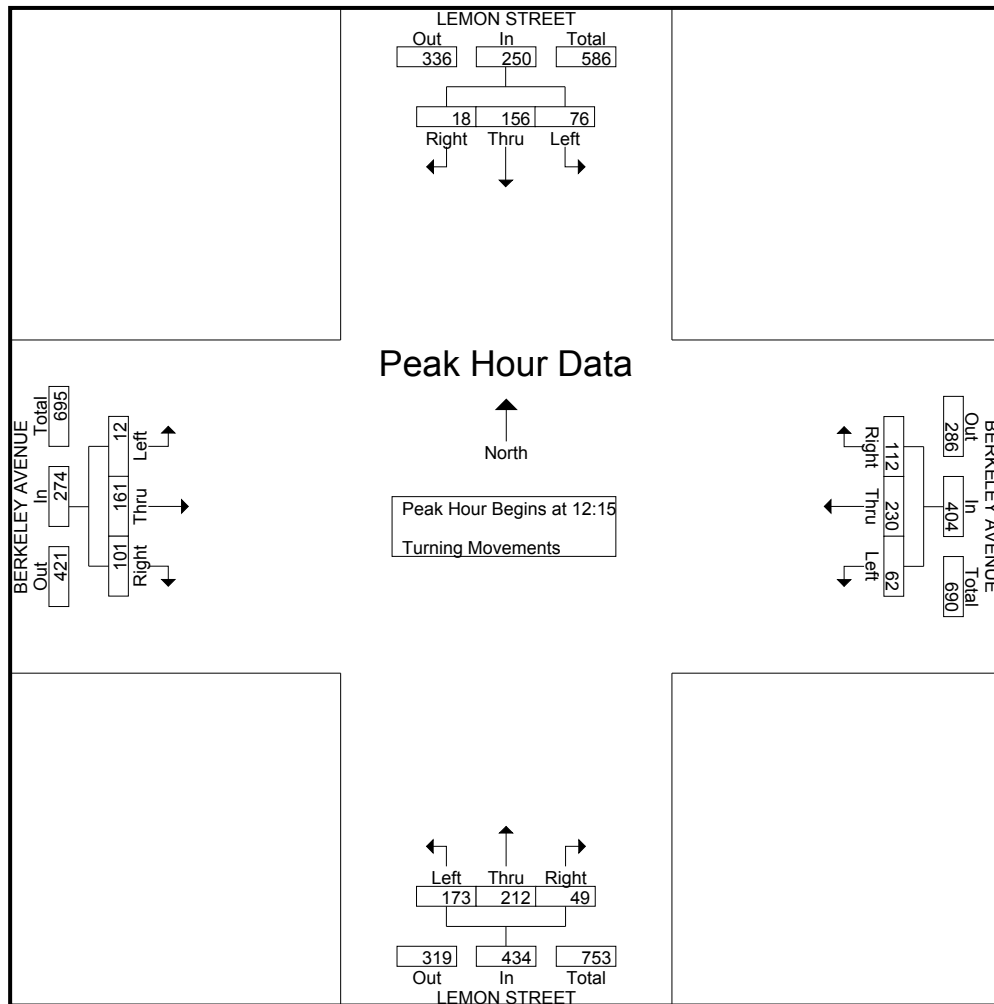
Groups Printed- Turning Movements

	LEMON STREET Southbound			BERKELEY AVENUE Westbound			LEMON STREET Northbound			BERKELEY AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	6	41	11	21	51	7	18	46	44	21	27	5	298
12:15	4	43	15	23	63	26	15	65	53	24	35	2	368
12:30	1	39	14	13	59	8	11	53	36	32	48	9	323
12:45	8	36	28	63	50	10	12	32	49	21	45	0	354
Total	19	159	68	120	223	51	56	196	182	98	155	16	1343
13:00	5	38	19	13	58	18	11	62	35	24	33	1	317
13:15	5	29	17	17	46	7	11	64	32	27	38	6	299
13:30	0	41	9	27	49	8	9	51	24	12	29	7	266
13:45	4	40	19	14	47	11	7	42	44	24	47	7	306
Total	14	148	64	71	200	44	38	219	135	87	147	21	1188
*** BREAK ***													
15:30	2	58	14	18	45	6	8	42	31	23	24	5	276
15:45	3	36	11	13	34	12	8	54	25	15	36	4	251
Total	5	94	25	31	79	18	16	96	56	38	60	9	527
16:00	4	43	17	11	50	8	11	49	30	19	43	4	289
16:15	9	42	12	11	47	19	6	44	32	21	36	5	284
16:30	6	60	11	13	39	5	8	44	30	15	39	2	272
16:45	4	40	11	20	37	17	14	45	29	18	26	3	264
Total	23	185	51	55	173	49	39	182	121	73	144	14	1109
17:00	9	63	16	12	43	7	10	37	25	20	30	2	274
17:15	3	42	6	13	41	8	13	36	34	19	46	4	265
Grand Total	73	691	230	302	759	177	172	766	553	335	582	66	4706
Apprch %	7.3	69.5	23.1	24.4	61.3	14.3	11.5	51.4	37.1	34.1	59.2	6.7	
Total %	1.6	14.7	4.9	6.4	16.1	3.8	3.7	16.3	11.8	7.1	12.4	1.4	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: BERKELEY AVENUE

File Name : H1711027  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

	LEMON STREET Southbound				BERKELEY AVENUE Westbound				LEMON STREET Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	4	43	15	62	23	63	26	112	15	65	53	133	24	35	2	61	368
12:30	1	39	14	54	13	59	8	80	11	53	36	100	32	48	9	89	323
12:45	8	36	28	72	63	50	10	123	12	32	49	93	21	45	0	66	354
13:00	5	38	19	62	13	58	18	89	11	62	35	108	24	33	1	58	317
Total Volume	18	156	76	250	112	230	62	404	49	212	173	434	101	161	12	274	1362
% App. Total	7.2	62.4	30.4		27.7	56.9	15.3		11.3	48.8	39.9		36.9	58.8	4.4		
PHF	.563	.907	.679	.868	.444	.913	.596	.821	.817	.815	.816	.816	.789	.839	.333	.770	.925

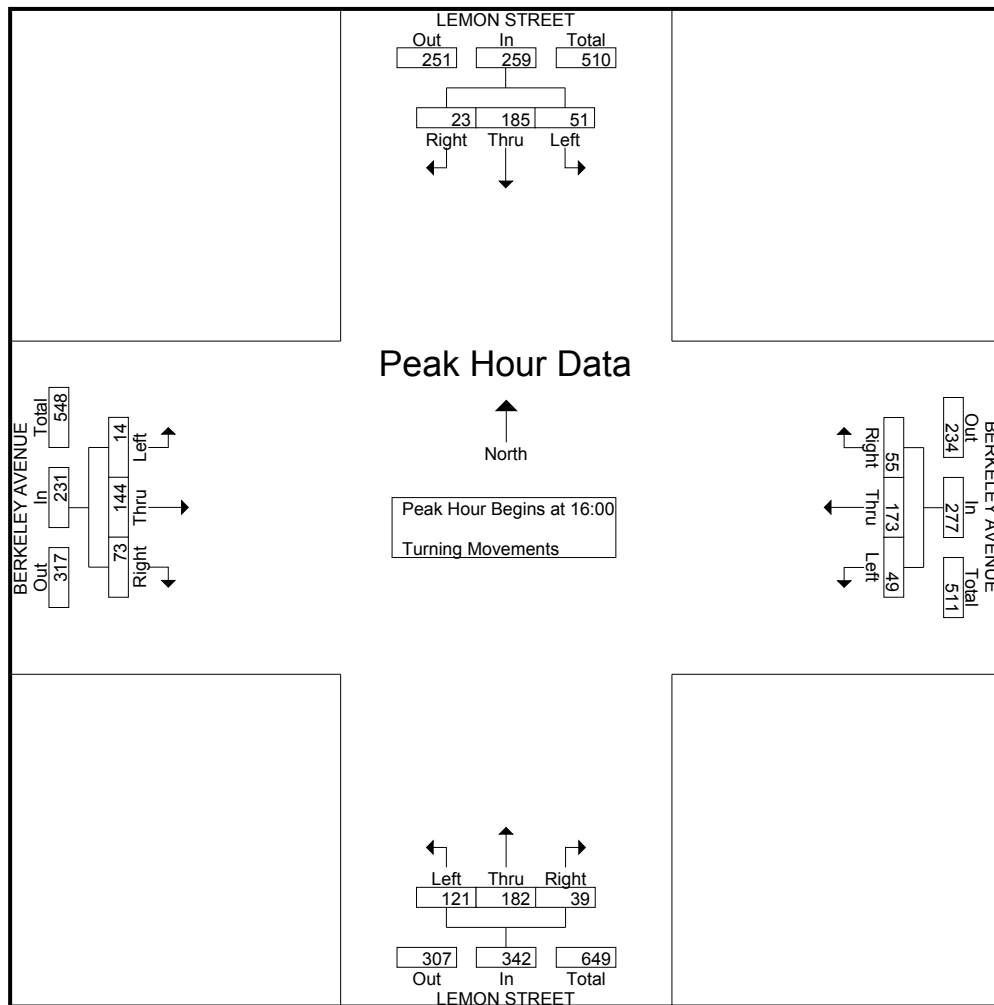




City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: BERKELEY AVENUE

File Name : H1711027  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				BERKELEY AVENUE Westbound				LEMON STREET Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	4	43	17	64	11	50	8	69	11	49	30	90	19	43	4	66	289
16:15	9	42	12	63	11	47	19	77	6	44	32	82	21	36	5	62	284
16:30	6	60	11	77	13	39	5	57	8	44	30	82	15	39	2	56	272
16:45	4	40	11	55	20	37	17	74	14	45	29	88	18	26	3	47	264
Total Volume	23	185	51	259	55	173	49	277	39	182	121	342	73	144	14	231	1109
% App. Total	8.9	71.4	19.7		19.9	62.5	17.7		11.4	53.2	35.4		31.6	62.3	6.1		
PHF	.639	.771	.750	.841	.688	.865	.645	.899	.696	.929	.945	.950	.869	.837	.700	.875	.959



City: FULLERTON  
N-S Direction: HORNET WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711028  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

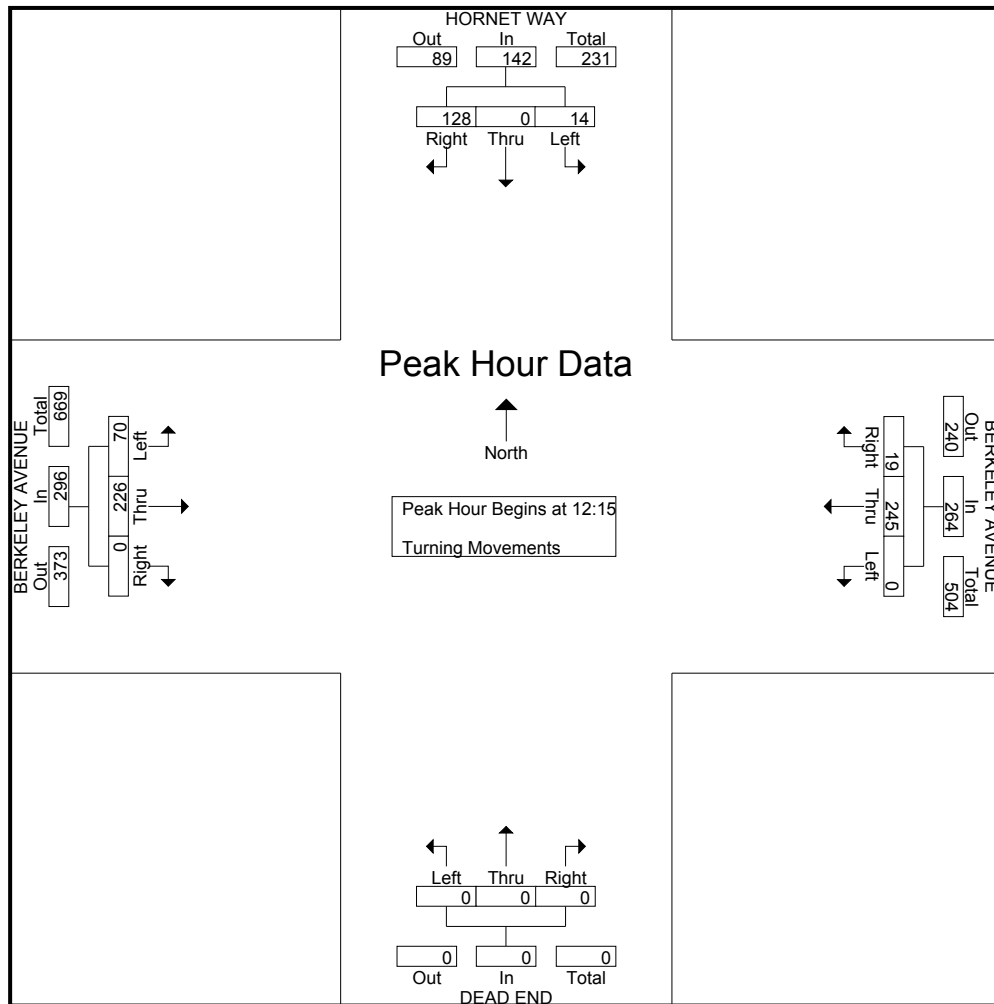
Groups Printed- Turning Movements

	HORNET WAY Southbound			BERKELEY AVENUE Westbound			DEAD END Northbound			BERKELEY AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	27	0	3	5	49	0	0	0	0	0	36	26	146
12:15	38	0	1	1	59	0	0	0	0	0	58	8	165
12:30	29	0	4	7	48	0	0	0	0	0	58	19	165
12:45	30	0	6	2	94	0	0	0	0	0	62	21	215
Total	124	0	14	15	250	0	0	0	0	0	214	74	691
13:00	31	0	3	9	44	0	0	0	0	0	48	22	157
13:15	22	0	2	4	46	0	0	0	0	0	44	21	139
13:30	25	0	1	5	55	0	0	0	0	0	30	15	131
13:45	26	0	0	6	47	0	0	0	0	0	57	21	157
Total	104	0	6	24	192	0	0	0	0	0	179	79	584
*** BREAK ***													
15:30	21	0	5	1	44	0	0	0	0	0	29	18	118
15:45	25	0	0	4	37	0	0	0	0	0	36	21	123
Total	46	0	5	5	81	0	0	0	0	0	65	39	241
16:00	27	0	0	3	39	0	0	0	0	0	50	23	142
16:15	23	0	2	0	43	0	0	0	0	0	39	14	121
16:30	24	0	11	4	39	0	0	0	0	0	41	18	137
16:45	28	0	2	1	42	0	0	0	0	0	21	22	116
Total	102	0	15	8	163	0	0	0	0	0	151	77	516
17:00	18	0	3	4	41	0	0	0	0	0	43	26	135
17:15	19	0	1	6	40	0	0	0	0	0	42	26	134
Grand Total	413	0	44	62	767	0	0	0	0	0	694	321	2301
Apprch %	90.4	0	9.6	7.5	92.5	0	0	0	0	0	68.4	31.6	
Total %	17.9	0	1.9	2.7	33.3	0	0	0	0	0	30.2	14	

City: FULLERTON  
N-S Direction: HORNET WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711028  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

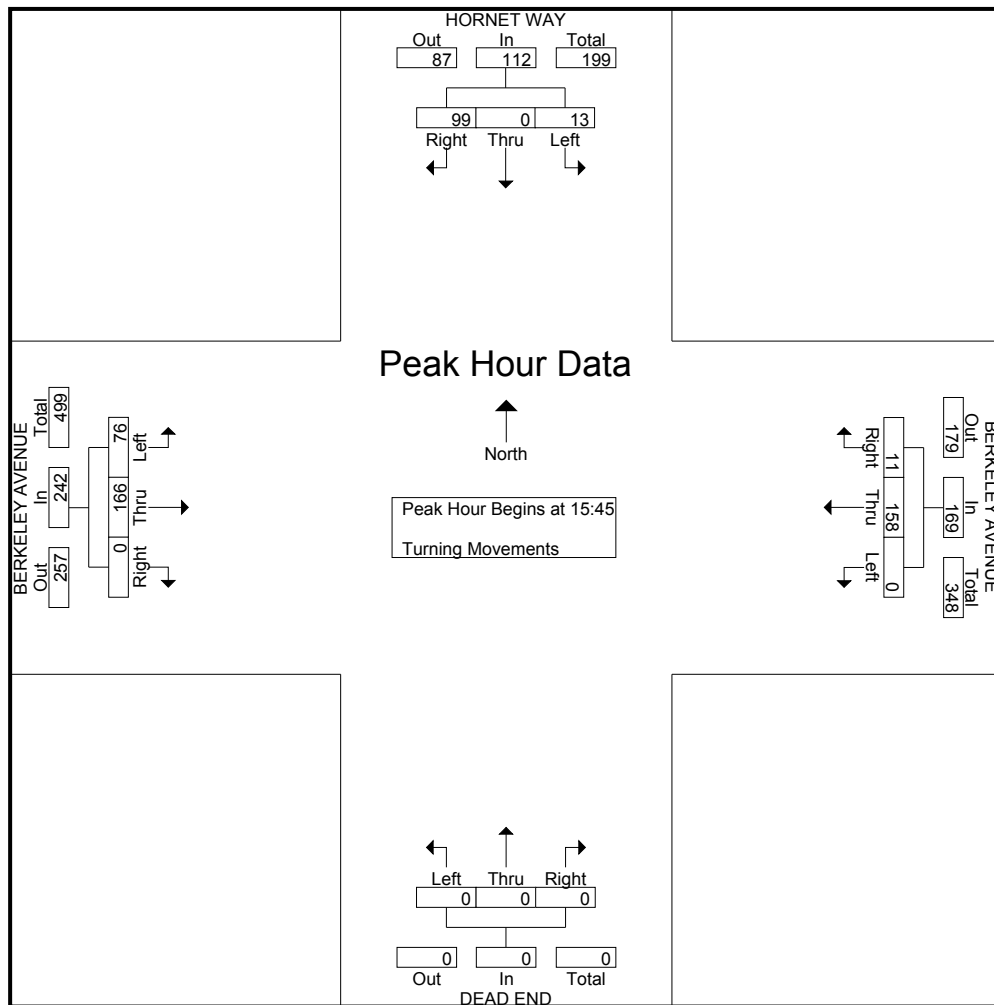
	HORNET WAY Southbound				BERKELEY AVENUE Westbound				DEAD END Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	38	0	1	39	1	59	0	60	0	0	0	0	0	58	8	66	165
12:30	29	0	4	33	7	48	0	55	0	0	0	0	0	58	19	77	165
12:45	30	0	6	36	2	94	0	96	0	0	0	0	0	62	21	83	215
13:00	31	0	3	34	9	44	0	53	0	0	0	0	0	48	22	70	157
Total Volume	128	0	14	142	19	245	0	264	0	0	0	0	0	226	70	296	702
% App. Total	90.1	0	9.9		7.2	92.8	0		0	0	0	0	0	76.4	23.6		
PHF	.842	.000	.583	.910	.528	.652	.000	.688	.000	.000	.000	.000	.000	.911	.795	.892	.816



City: FULLERTON  
N-S Direction: HORNET WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711028  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HORNET WAY Southbound				BERKELEY AVENUE Westbound				DEAD END Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:45																	
15:45	25	0	0	25	4	37	0	41	0	0	0	0	0	36	21	57	123
16:00	27	0	0	27	3	39	0	42	0	0	0	0	0	50	23	73	142
16:15	23	0	2	25	0	43	0	43	0	0	0	0	0	39	14	53	121
16:30	24	0	11	35	4	39	0	43	0	0	0	0	0	41	18	59	137
Total Volume	99	0	13	112	11	158	0	169	0	0	0	0	0	166	76	242	523
% App. Total	88.4	0	11.6		6.5	93.5	0		0	0	0	0	0	68.6	31.4		
PHF	.917	.000	.295	.800	.688	.919	.000	.983	.000	.000	.000	.000	.000	.830	.826	.829	.921



City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711029  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

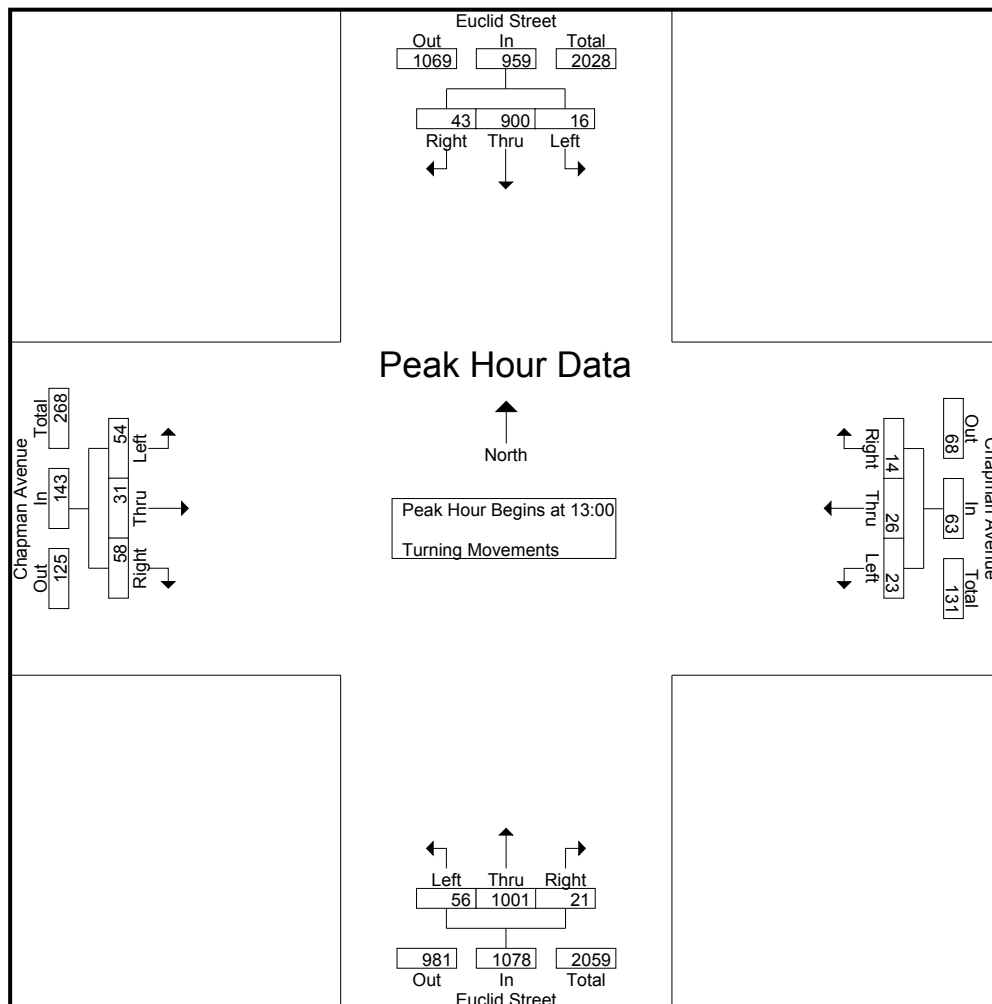
Groups Printed- Turning Movements

	Euclid Street Southbound			Chapman Avenue Westbound			Euclid Street Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	9	202	3	3	6	4	5	194	8	11	8	14	467
12:15	7	230	2	3	5	4	3	184	14	10	6	11	479
12:30	13	195	9	4	4	7	3	269	7	12	6	8	537
12:45	12	232	4	5	4	5	4	206	10	5	8	9	504
Total	41	859	18	15	19	20	15	853	39	38	28	42	1987
13:00	11	239	5	2	5	5	4	251	12	19	8	12	573
13:15	13	220	3	6	7	7	6	255	14	17	10	17	575
13:30	11	209	3	6	5	2	3	252	15	11	7	12	536
13:45	8	232	5	0	9	9	8	243	15	11	6	13	559
Total	43	900	16	14	26	23	21	1001	56	58	31	54	2243
15:30	10	235	3	4	4	8	4	236	8	15	5	9	541
15:45	8	189	1	2	4	6	5	235	11	14	6	11	492
Total	18	424	4	6	8	14	9	471	19	29	11	20	1033
16:00	13	220	9	5	9	3	4	246	11	7	8	13	548
16:15	6	198	9	3	6	6	1	254	9	12	12	9	525
16:30	17	232	4	7	5	9	5	252	5	13	15	14	578
16:45	9	188	5	2	7	2	7	241	12	16	8	7	504
Total	45	838	27	17	27	20	17	993	37	48	43	43	2155
17:00	12	232	4	5	4	6	7	217	11	3	14	12	527
17:15	12	248	4	6	3	4	3	217	12	16	8	14	547
Grand Total	171	3501	73	63	87	87	72	3752	174	192	135	185	8492
Apprch %	4.6	93.5	1.9	26.6	36.7	36.7	1.8	93.8	4.4	37.5	26.4	36.1	
Total %	2	41.2	0.9	0.7	1	1	0.8	44.2	2	2.3	1.6	2.2	

City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711029  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

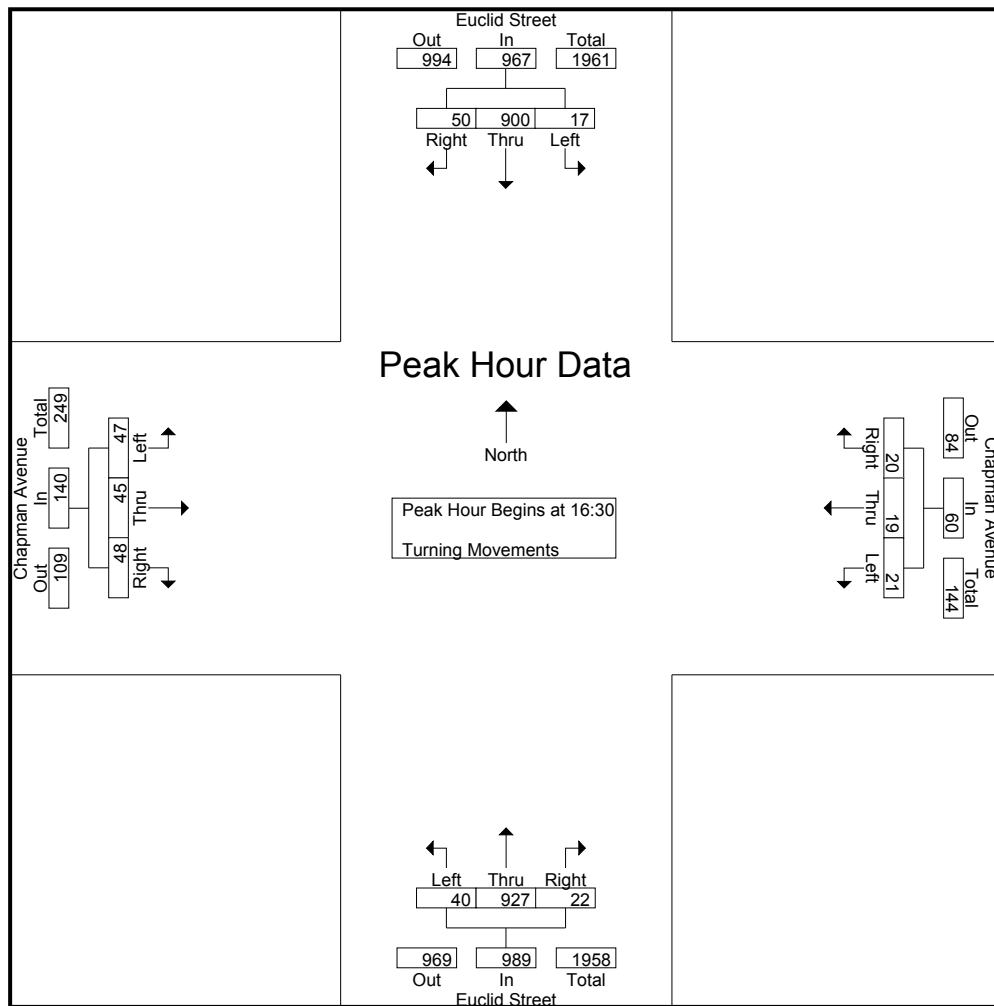
	Euclid Street Southbound				Chapman Avenue Westbound				Euclid Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 13:00																	
13:00	11	239	5	255	2	5	5	12	4	251	12	267	19	8	12	39	573
13:15	13	220	3	236	6	7	7	20	6	255	14	275	17	10	17	44	575
13:30	11	209	3	223	6	5	2	13	3	252	15	270	11	7	12	30	536
13:45	8	232	5	245	0	9	9	18	8	243	15	266	11	6	13	30	559
Total Volume	43	900	16	959	14	26	23	63	21	1001	56	1078	58	31	54	143	2243
% App. Total	4.5	93.8	1.7		22.2	41.3	36.5		1.9	92.9	5.2		40.6	21.7	37.8		
PHF	.827	.941	.800	.940	.583	.722	.639	.788	.656	.981	.933	.980	.763	.775	.794	.813	.975



City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711029  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Euclid Street Southbound				Chapman Avenue Westbound				Euclid Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	17	232	4	253	7	5	9	21	5	252	5	262	13	15	14	42	578
16:45	9	188	5	202	2	7	2	11	7	241	12	260	16	8	7	31	504
17:00	12	232	4	248	5	4	6	15	7	217	11	235	3	14	12	29	527
17:15	12	248	4	264	6	3	4	13	3	217	12	232	16	8	14	38	547
Total Volume	50	900	17	967	20	19	21	60	22	927	40	989	48	45	47	140	2156
% App. Total	5.2	93.1	1.8		33.3	31.7	35		2.2	93.7	4		34.3	32.1	33.6		
PHF	.735	.907	.850	.916	.714	.679	.583	.714	.786	.920	.833	.944	.750	.750	.839	.833	.933



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711030  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

Groups Printed- Turning Movements

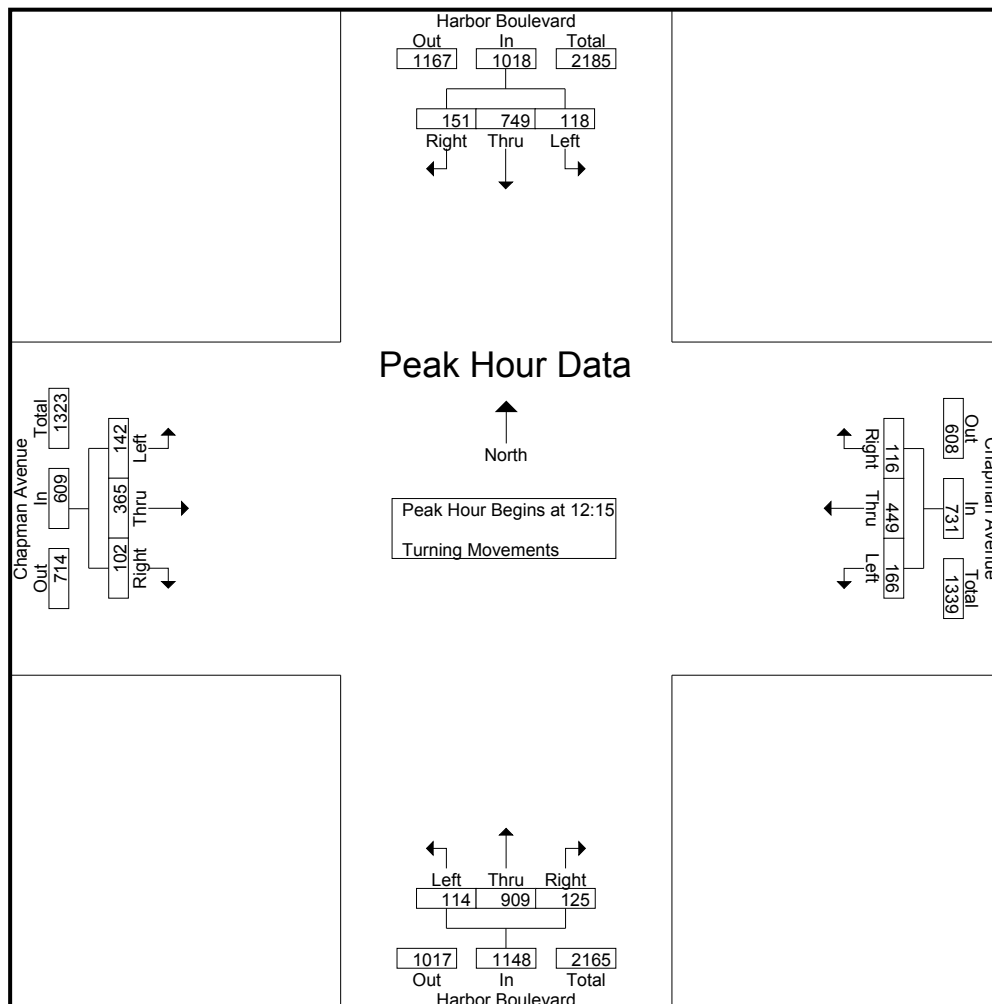
	Harbor Boulevard Southbound			Chapman Avenue Westbound			Harbor Boulevard Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	34	169	21	30	146	42	31	214	31	25	92	47	882
12:15	32	201	20	28	115	39	30	223	29	36	100	27	880
12:30	47	168	38	30	106	56	37	225	31	16	75	44	873
12:45	37	200	27	25	107	44	28	230	34	22	78	35	867
Total	150	738	106	113	474	181	126	892	125	99	345	153	3502
13:00	35	180	33	33	121	27	30	231	20	28	112	36	886
13:15	37	166	40	28	102	29	36	219	35	32	104	44	872
13:30	28	157	24	20	97	38	38	220	36	24	94	60	836
13:45	29	202	23	32	110	36	39	235	28	26	74	30	864
Total	129	705	120	113	430	130	143	905	119	110	384	170	3458
15:30	25	167	25	26	99	49	28	203	32	29	90	41	814
15:45	30	167	19	25	98	42	22	231	19	18	78	38	787
Total	55	334	44	51	197	91	50	434	51	47	168	79	1601
16:00	25	161	26	12	91	40	19	221	20	21	77	34	747
16:15	32	181	25	25	119	42	23	212	26	31	80	39	835
16:30	36	210	28	25	108	55	34	220	26	24	92	43	901
16:45	21	189	37	25	98	50	29	231	27	22	110	46	885
Total	114	741	116	87	416	187	105	884	99	98	359	162	3368
17:00	29	158	29	21	107	49	23	213	24	24	95	52	824
17:15	23	158	18	22	119	42	24	204	29	25	79	33	776
Grand Total	500	2834	433	407	1743	680	471	3532	447	403	1430	649	13529
Apprch %	13.3	75.2	11.5	14.4	61.6	24	10.6	79.4	10	16.2	57.6	26.1	
Total %	3.7	20.9	3.2	3	12.9	5	3.5	26.1	3.3	3	10.6	4.8	



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711030  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

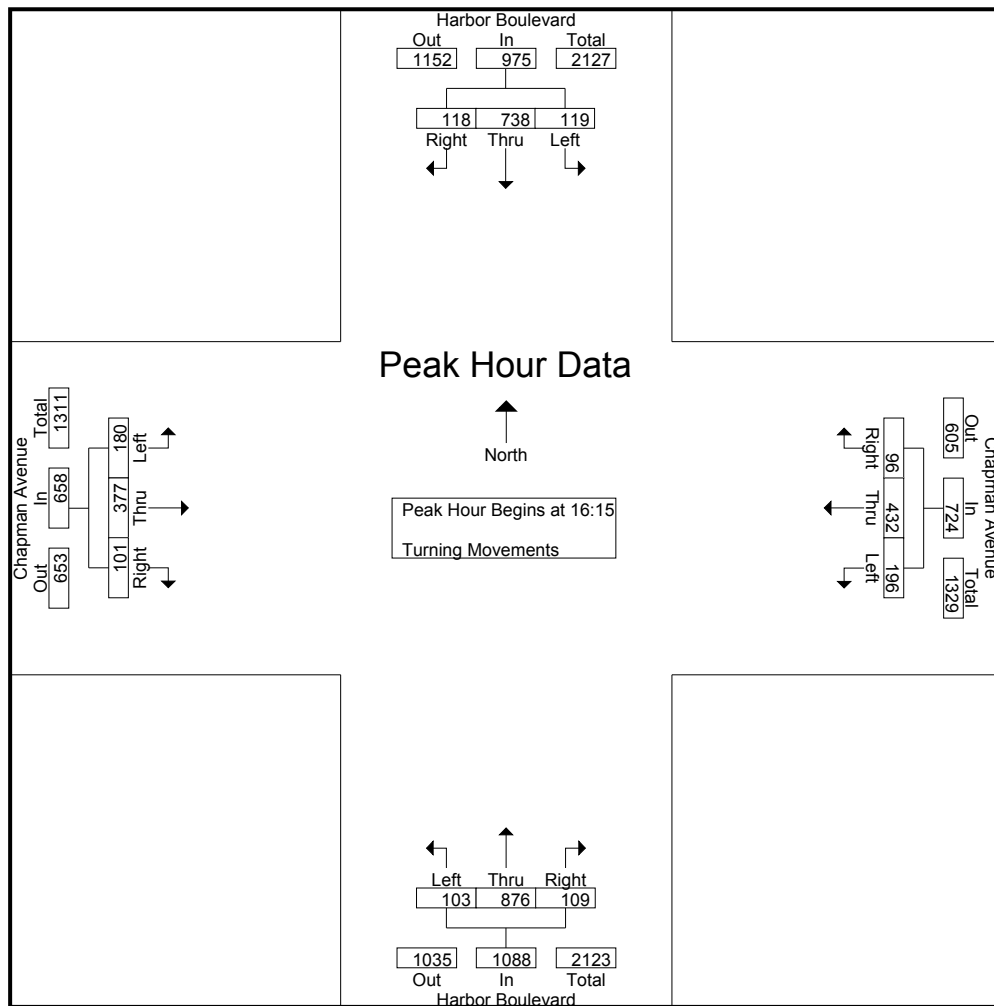
	Harbor Boulevard Southbound				Chapman Avenue Westbound				Harbor Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	32	201	20	253	28	115	39	182	30	223	29	282	36	100	27	163	880
12:30	47	168	38	253	30	106	56	192	37	225	31	293	16	75	44	135	873
12:45	37	200	27	264	25	107	44	176	28	230	34	292	22	78	35	135	867
13:00	35	180	33	248	33	121	27	181	30	231	20	281	28	112	36	176	886
Total Volume	151	749	118	1018	116	449	166	731	125	909	114	1148	102	365	142	609	3506
% App. Total	14.8	73.6	11.6		15.9	61.4	22.7		10.9	79.2	9.9		16.7	59.9	23.3		
PHF	.803	.932	.776	.964	.879	.928	.741	.952	.845	.984	.838	.980	.708	.815	.807	.865	.989



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711030  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Harbor Boulevard Southbound				Chapman Avenue Westbound				Harbor Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	32	181	25	238	25	119	42	186	23	212	26	261	31	80	39	150	835
16:30	36	210	28	274	25	108	55	188	34	220	26	280	24	92	43	159	901
16:45	21	189	37	247	25	98	50	173	29	231	27	287	22	110	46	178	885
17:00	29	158	29	216	21	107	49	177	23	213	24	260	24	95	52	171	824
Total Volume	118	738	119	975	96	432	196	724	109	876	103	1088	101	377	180	658	3445
% App. Total	12.1	75.7	12.2		13.3	59.7	27.1		10	80.5	9.5		15.3	57.3	27.4		
PHF	.819	.879	.804	.890	.960	.908	.891	.963	.801	.948	.954	.948	.815	.857	.865	.924	.956



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711031  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

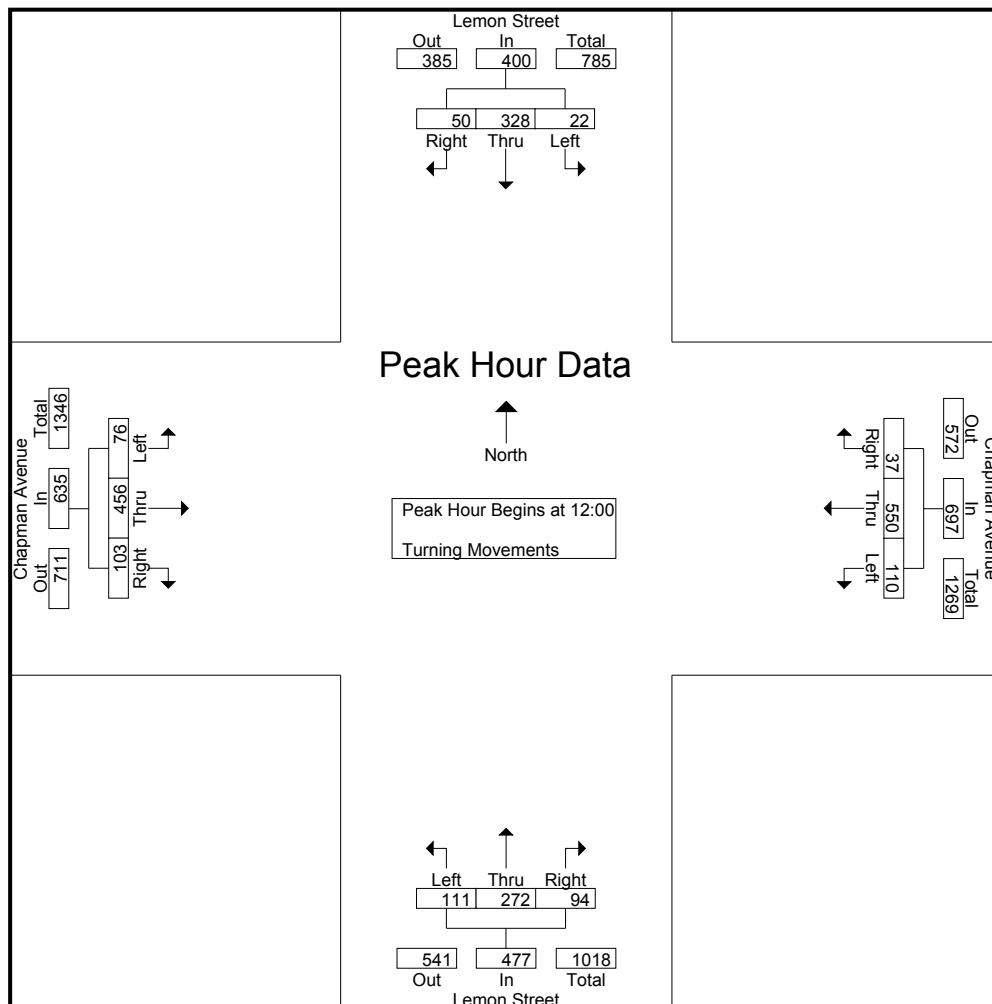
Groups Printed- Turning Movements

	Lemon Street Southbound			Chapman Avenue Westbound			Lemon Street Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	9	77	5	6	156	22	31	55	31	23	133	26	574
12:15	11	82	3	7	116	37	22	62	27	33	119	14	533
12:30	15	87	11	13	134	27	20	84	23	22	105	26	567
12:45	15	82	3	11	144	24	21	71	30	25	99	10	535
Total	50	328	22	37	550	110	94	272	111	103	456	76	2209
13:00	6	53	2	10	125	41	20	81	25	35	128	18	544
13:15	15	74	5	11	114	29	22	74	30	23	116	17	530
13:30	7	55	10	14	115	29	19	71	25	14	123	16	498
13:45	13	75	24	6	142	48	26	75	29	29	99	18	584
Total	41	257	41	41	496	147	87	301	109	101	466	69	2156
15:30	10	50	7	7	110	27	19	72	25	26	112	9	474
15:45	4	47	5	7	139	23	23	65	25	20	120	11	489
Total	14	97	12	14	249	50	42	137	50	46	232	20	963
16:00	15	40	1	7	108	35	20	57	24	25	111	18	461
16:15	22	47	8	10	131	23	16	60	19	27	107	20	490
16:30	22	73	29	11	130	27	19	60	24	31	111	18	555
16:45	17	48	8	9	121	32	24	66	29	23	128	32	537
Total	76	208	46	37	490	117	79	243	96	106	457	88	2043
17:00	22	67	10	6	115	29	21	62	14	24	120	22	512
17:15	24	59	5	6	108	31	14	66	17	18	93	11	452
Grand Total	227	1016	136	141	2008	484	337	1081	397	398	1824	286	8335
Apprch %	16.5	73.7	9.9	5.4	76.3	18.4	18.6	59.6	21.9	15.9	72.7	11.4	
Total %	2.7	12.2	1.6	1.7	24.1	5.8	4	13	4.8	4.8	21.9	3.4	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711031  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

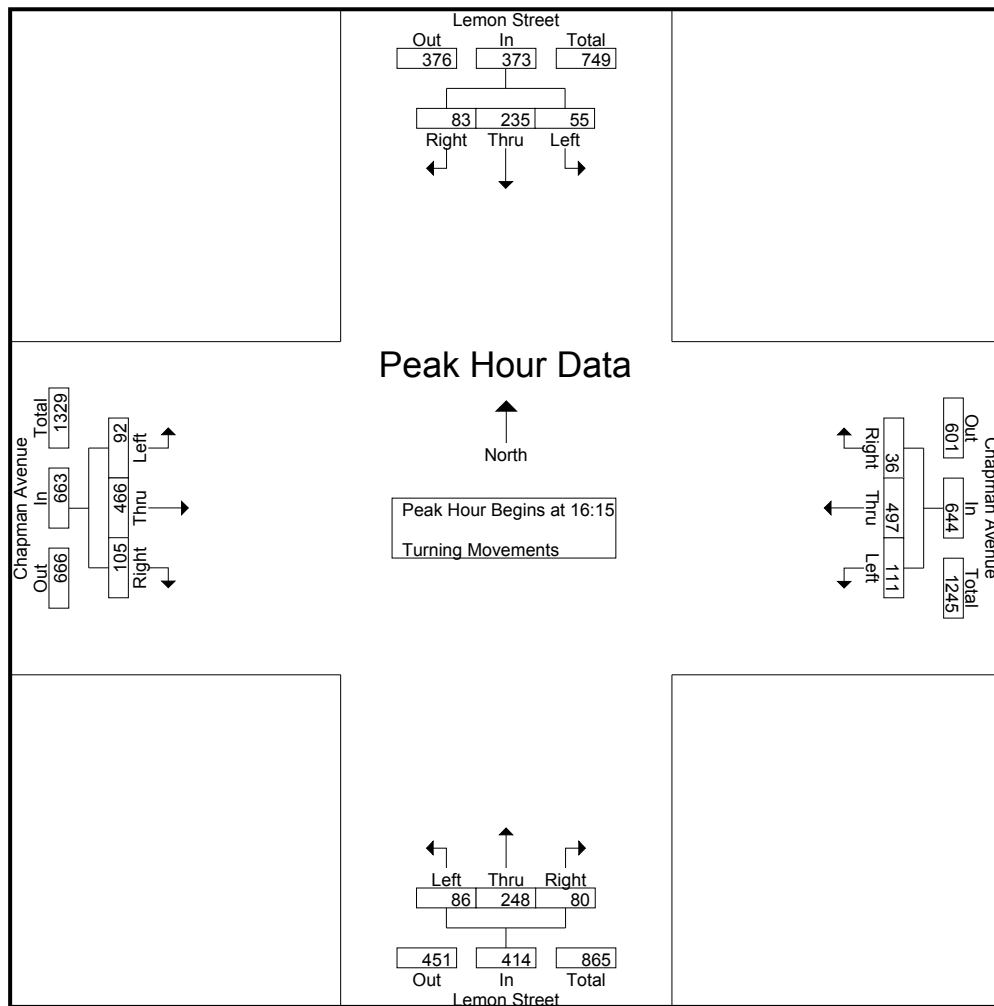
	Lemon Street Southbound				Chapman Avenue Westbound				Lemon Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	9	77	5	91	6	156	22	184	31	55	31	117	23	133	26	182	574
12:15	11	82	3	96	7	116	37	160	22	62	27	111	33	119	14	166	533
12:30	15	87	11	113	13	134	27	174	20	84	23	127	22	105	26	153	567
12:45	15	82	3	100	11	144	24	179	21	71	30	122	25	99	10	134	535
Total Volume	50	328	22	400	37	550	110	697	94	272	111	477	103	456	76	635	2209
% App. Total	12.5	82	5.5		5.3	78.9	15.8		19.7	57	23.3		16.2	71.8	12		
PHF	.833	.943	.500	.885	.712	.881	.743	.947	.758	.810	.895	.939	.780	.857	.731	.872	.962



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: CHAPMAN AVENUE

File Name : H1711031  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Lemon Street Southbound				Chapman Avenue Westbound				Lemon Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	22	47	8	77	10	131	23	164	16	60	19	95	27	107	20	154	490
16:30	22	73	29	124	11	130	27	168	19	60	24	103	31	111	18	160	555
16:45	17	48	8	73	9	121	32	162	24	66	29	119	23	128	32	183	537
17:00	22	67	10	99	6	115	29	150	21	62	14	97	24	120	22	166	512
Total Volume	83	235	55	373	36	497	111	644	80	248	86	414	105	466	92	663	2094
% App. Total	22.3	63	14.7		5.6	77.2	17.2		19.3	59.9	20.8		15.8	70.3	13.9		
PHF	.943	.805	.474	.752	.818	.948	.867	.958	.833	.939	.741	.870	.847	.910	.719	.906	.943



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : h1711032  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

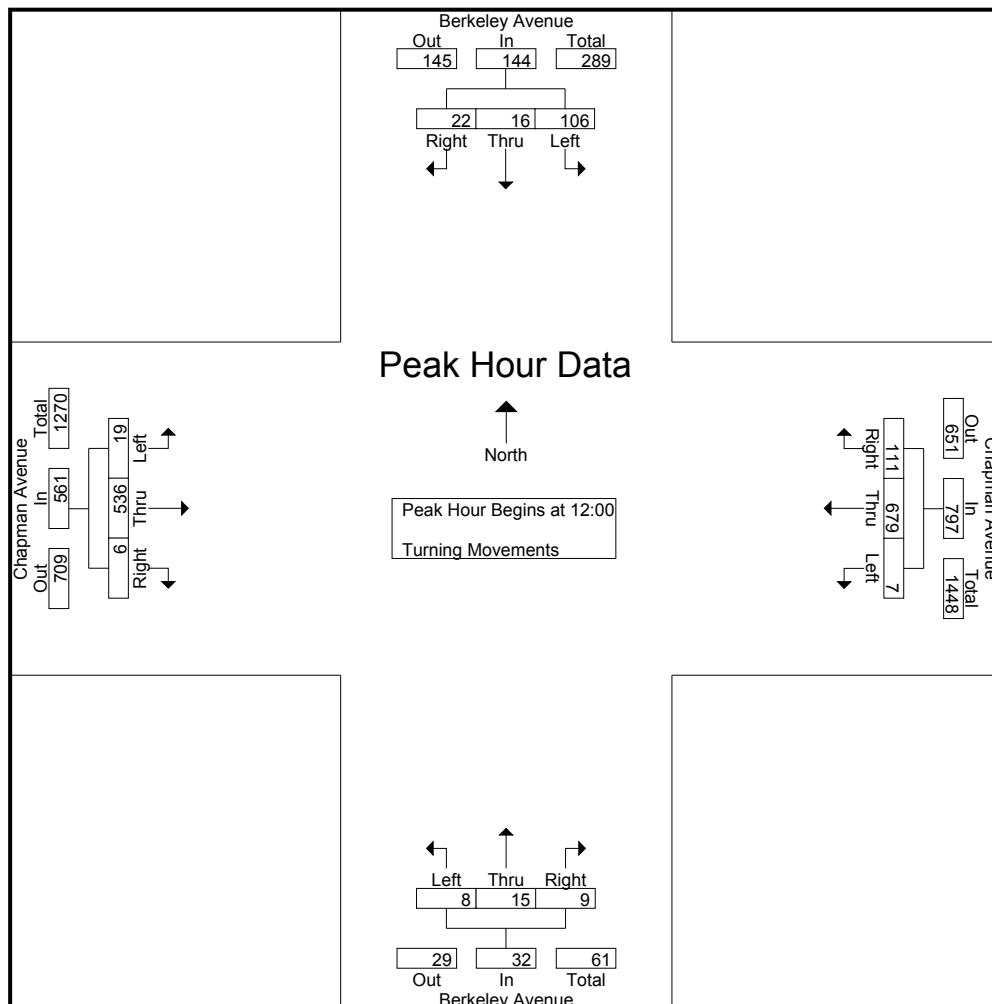
Groups Printed- Turning Movements

	Berkeley Avenue Southbound			Chapman Avenue Westbound			Berkeley Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	9	5	21	23	171	3	2	5	3	2	160	6	410
12:15	3	3	27	22	160	2	4	6	2	1	141	3	374
12:30	9	4	29	40	170	2	1	2	1	2	121	6	387
12:45	1	4	29	26	178	0	2	2	2	1	114	4	363
Total	22	16	106	111	679	7	9	15	8	6	536	19	1534
13:00	5	4	23	22	155	2	6	5	0	2	142	5	371
13:15	8	5	26	25	151	7	3	4	2	1	132	8	372
13:30	5	5	28	31	152	3	2	5	1	1	154	1	388
13:45	9	2	24	20	177	2	3	6	0	1	141	4	389
Total	27	16	101	98	635	14	14	20	3	5	569	18	1520
15:30	3	3	30	28	144	1	4	6	0	2	135	7	363
15:45	1	2	28	28	178	5	3	2	2	2	146	3	400
Total	4	5	58	56	322	6	7	8	2	4	281	10	763
16:00	3	4	22	26	149	3	4	7	0	0	132	5	355
16:15	3	4	19	22	160	6	6	4	1	0	135	0	360
16:30	7	2	29	25	171	3	2	3	1	1	151	8	403
16:45	4	2	23	21	147	0	0	2	5	2	149	7	362
Total	17	12	93	94	627	12	12	16	7	3	567	20	1480
17:00	9	5	25	27	154	0	1	0	1	0	136	3	361
17:15	5	3	19	19	149	1	2	2	1	0	109	3	313
Grand Total	84	57	402	405	2566	40	45	61	22	18	2198	73	5971
Apprch %	15.5	10.5	74	13.5	85.2	1.3	35.2	47.7	17.2	0.8	96	3.2	
Total %	1.4	1	6.7	6.8	43	0.7	0.8	1	0.4	0.3	36.8	1.2	

City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : h1711032  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

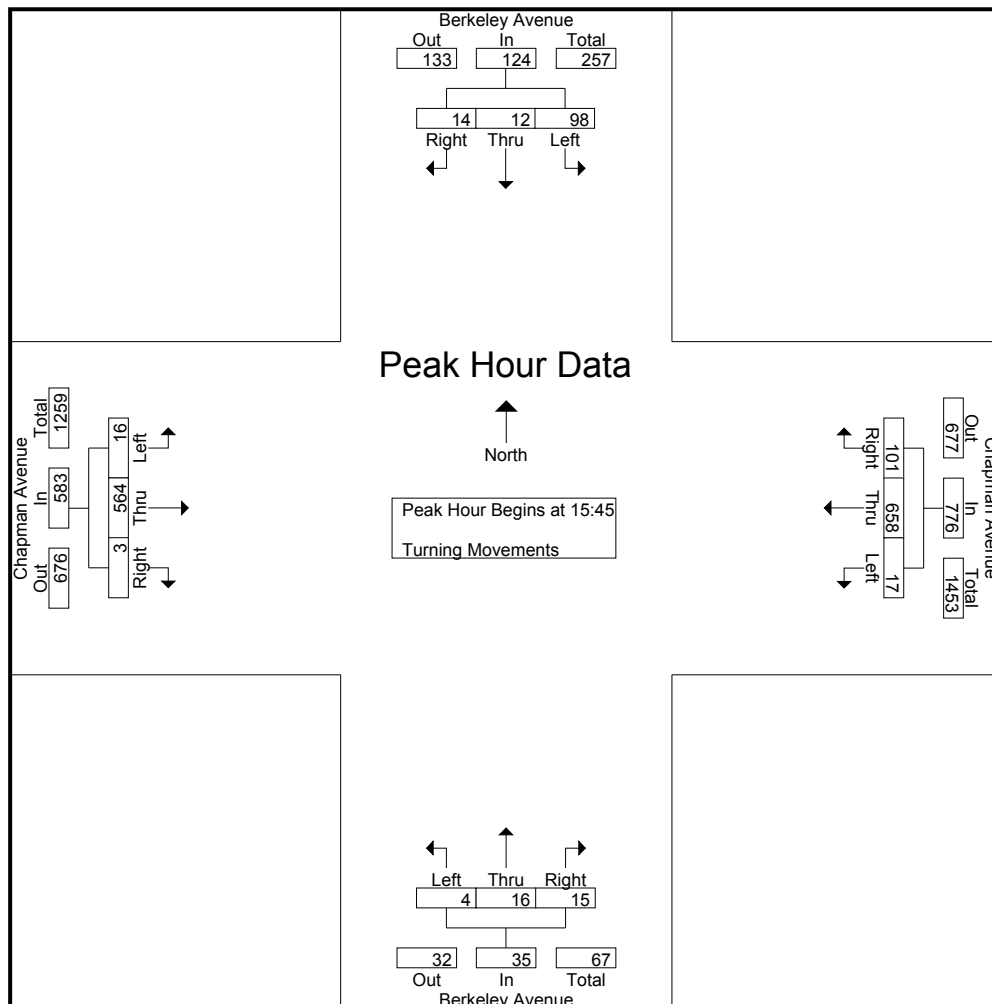
	Berkeley Avenue Southbound				Chapman Avenue Westbound				Berkeley Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	9	5	21	35	23	171	3	197	2	5	3	10	2	160	6	168	410
12:15	3	3	27	33	22	160	2	184	4	6	2	12	1	141	3	145	374
12:30	9	4	29	42	40	170	2	212	1	2	1	4	2	121	6	129	387
12:45	1	4	29	34	26	178	0	204	2	2	2	6	1	114	4	119	363
Total Volume	22	16	106	144	111	679	7	797	9	15	8	32	6	536	19	561	1534
% App. Total	15.3	11.1	73.6		13.9	85.2	0.9		28.1	46.9	25		1.1	95.5	3.4		
PHF	.611	.800	.914	.857	.694	.954	.583	.940	.563	.625	.667	.667	.750	.838	.792	.835	.935



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : h1711032  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Berkeley Avenue Southbound				Chapman Avenue Westbound				Berkeley Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:45																	
15:45	1	2	28	31	28	178	5	211	3	2	2	7	2	146	3	151	400
16:00	3	4	22	29	26	149	3	178	4	7	0	11	0	132	5	137	355
16:15	3	4	19	26	22	160	6	188	6	4	1	11	0	135	0	135	360
16:30	7	2	29	38	25	171	3	199	2	3	1	6	1	151	8	160	403
Total Volume	14	12	98	124	101	658	17	776	15	16	4	35	3	564	16	583	1518
% App. Total	11.3	9.7	79		13	84.8	2.2		42.9	45.7	11.4		0.5	96.7	2.7		
PHF	.500	.750	.845	.816	.902	.924	.708	.919	.625	.571	.500	.795	.375	.934	.500	.911	.942





City: FULLERTON  
N-S Direction: RAYMOND AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711033  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

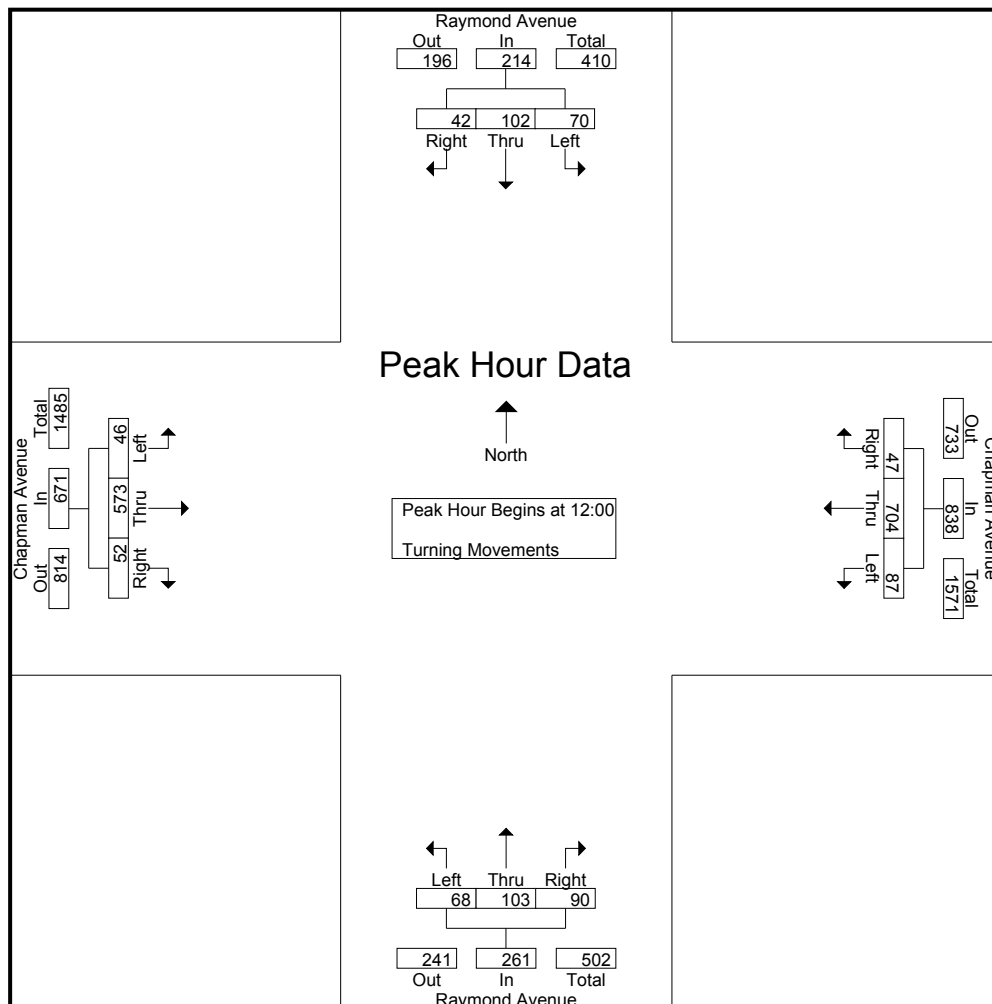
Groups Printed- Turning Movements

	Raymond Avenue Southbound			Chapman Avenue Westbound			Raymond Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	19	34	37	12	162	18	33	20	15	11	164	16	541
12:15	6	33	12	13	176	24	14	39	9	18	156	11	511
12:30	11	17	13	9	175	20	23	23	21	10	135	9	466
12:45	6	18	8	13	191	25	20	21	23	13	118	10	466
Total	42	102	70	47	704	87	90	103	68	52	573	46	1984
13:00	7	16	17	13	157	23	18	28	13	4	157	12	465
13:15	14	24	14	20	160	28	25	29	12	7	167	7	507
13:30	13	33	16	17	158	25	26	16	21	10	153	13	501
13:45	10	20	5	4	182	19	20	22	15	17	150	11	475
Total	44	93	52	54	657	95	89	95	61	38	627	43	1948
15:30	7	25	14	9	165	17	23	28	18	15	143	10	474
15:45	14	21	11	12	203	25	39	22	19	14	159	17	556
Total	21	46	25	21	368	42	62	50	37	29	302	27	1030
16:00	8	26	9	8	148	19	25	34	17	12	133	7	446
16:15	9	17	10	9	159	25	17	14	15	11	118	11	415
16:30	16	26	23	8	169	20	31	21	16	19	158	6	513
16:45	6	32	11	14	158	20	29	29	15	15	150	12	491
Total	39	101	53	39	634	84	102	98	63	57	559	36	1865
17:00	13	20	13	14	161	14	27	27	14	14	141	25	483
17:15	12	18	13	20	160	29	26	23	16	12	126	7	462
Grand Total	171	380	226	195	2684	351	396	396	259	202	2328	184	7772
Apprch %	22	48.9	29.1	6	83.1	10.9	37.7	37.7	24.6	7.4	85.8	6.8	
Total %	2.2	4.9	2.9	2.5	34.5	4.5	5.1	5.1	3.3	2.6	30	2.4	

City: FULLERTON  
N-S Direction: RAYMOND AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711033  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

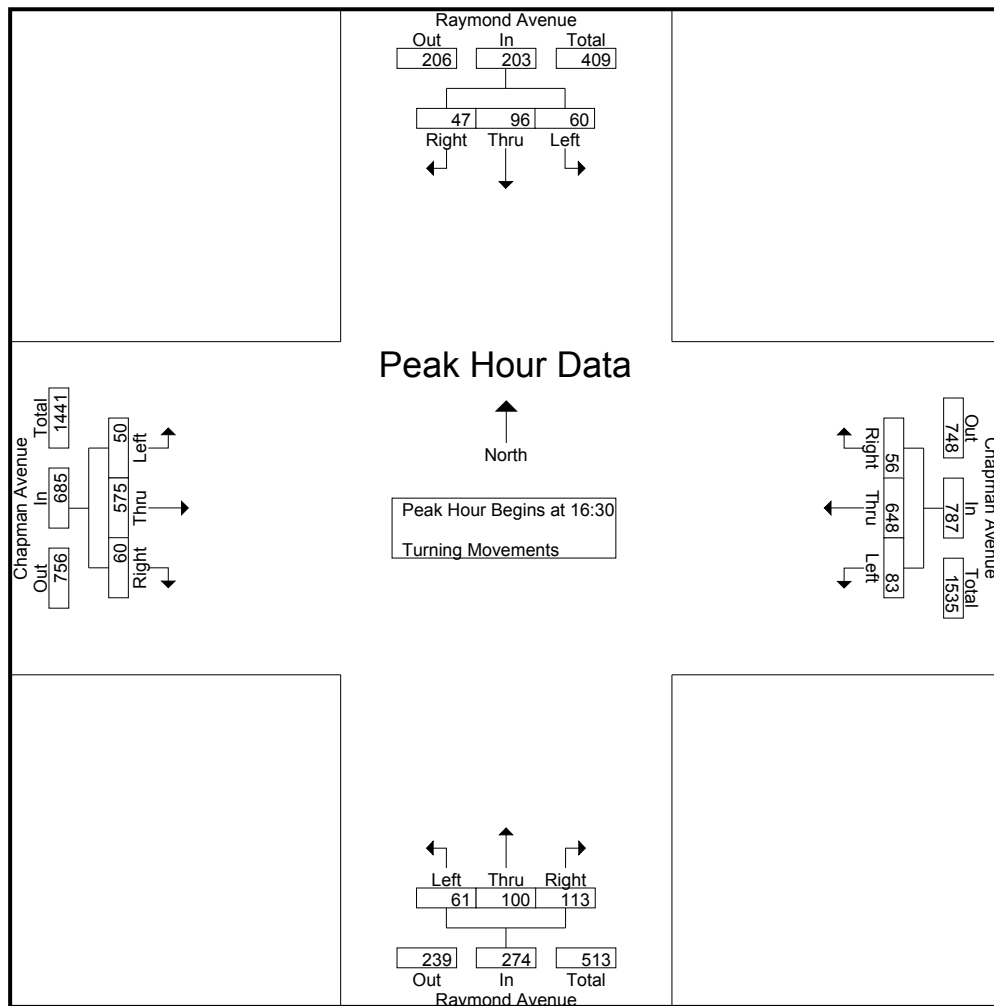
	Raymond Avenue Southbound				Chapman Avenue Westbound				Raymond Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	19	34	37	90	12	162	18	192	33	20	15	68	11	164	16	191	541
12:15	6	33	12	51	13	176	24	213	14	39	9	62	18	156	11	185	511
12:30	11	17	13	41	9	175	20	204	23	23	21	67	10	135	9	154	466
12:45	6	18	8	32	13	191	25	229	20	21	23	64	13	118	10	141	466
Total Volume	42	102	70	214	47	704	87	838	90	103	68	261	52	573	46	671	1984
% App. Total	19.6	47.7	32.7		5.6	84	10.4		34.5	39.5	26.1		7.7	85.4	6.9		
PHF	.553	.750	.473	.594	.904	.921	.870	.915	.682	.660	.739	.960	.722	.873	.719	.878	.917



City: FULLERTON  
N-S Direction: RAYMOND AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711033  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Raymond Avenue Southbound				Chapman Avenue Westbound				Raymond Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	16	26	23	65	8	169	20	197	31	21	16	68	19	158	6	183	513
16:45	6	32	11	49	14	158	20	192	29	29	15	73	15	150	12	177	491
17:00	13	20	13	46	14	161	14	189	27	27	14	68	14	141	25	180	483
17:15	12	18	13	43	20	160	29	209	26	23	16	65	12	126	7	145	462
Total Volume	47	96	60	203	56	648	83	787	113	100	61	274	60	575	50	685	1949
% App. Total	23.2	47.3	29.6		7.1	82.3	10.5		41.2	36.5	22.3		8.8	83.9	7.3		
PHF	.734	.750	.652	.781	.700	.959	.716	.941	.911	.862	.953	.938	.789	.910	.500	.936	.950



City: FULLERTON  
N-S Direction: ACACIA AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711034  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

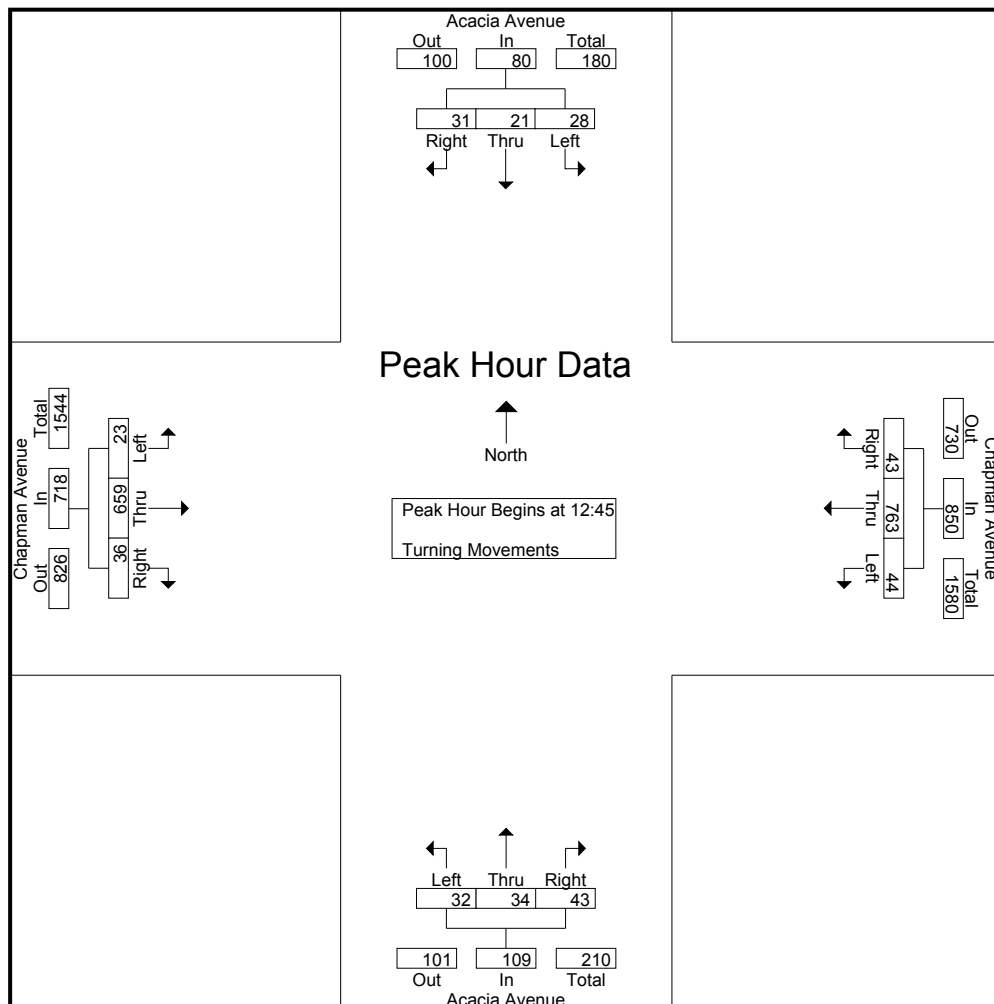
Groups Printed- Turning Movements

	Acacia Avenue Southbound			Chapman Avenue Westbound			Acacia Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	15	9	15	3	174	7	9	8	8	14	210	5	477
12:15	10	6	5	5	183	11	17	11	8	12	155	6	429
12:30	5	4	5	7	190	13	15	9	7	5	152	4	416
12:45	7	4	8	7	214	10	13	10	5	4	143	7	432
Total	37	23	33	22	761	41	54	38	28	35	660	22	1754
13:00	8	8	3	6	171	10	13	9	7	7	161	3	406
13:15	7	4	10	15	204	12	6	6	8	10	168	11	461
13:30	9	5	7	15	174	12	11	9	12	15	187	2	458
13:45	14	10	7	9	174	11	8	2	10	3	164	3	415
Total	38	27	27	45	723	45	38	26	37	35	680	19	1740
15:30	6	3	9	10	166	16	13	5	5	9	146	3	391
15:45	6	5	6	8	193	13	10	6	7	10	173	6	443
Total	12	8	15	18	359	29	23	11	12	19	319	9	834
16:00	0	5	4	6	172	12	8	8	7	3	160	3	388
16:15	3	5	6	10	206	7	16	6	5	9	147	0	420
16:30	0	7	9	6	176	7	18	4	11	4	172	7	421
16:45	7	6	8	11	179	12	16	12	6	9	154	7	427
Total	10	23	27	33	733	38	58	30	29	25	633	17	1656
17:00	10	12	12	5	166	13	13	8	7	5	162	6	419
17:15	5	8	2	6	181	11	4	6	6	6	129	3	367
Grand Total	112	101	116	129	2923	177	190	119	119	125	2583	76	6770
Apprch %	34	30.7	35.3	4	90.5	5.5	44.4	27.8	27.8	4.5	92.8	2.7	
Total %	1.7	1.5	1.7	1.9	43.2	2.6	2.8	1.8	1.8	1.8	38.2	1.1	

City: FULLERTON  
N-S Direction: ACACIA AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711034  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

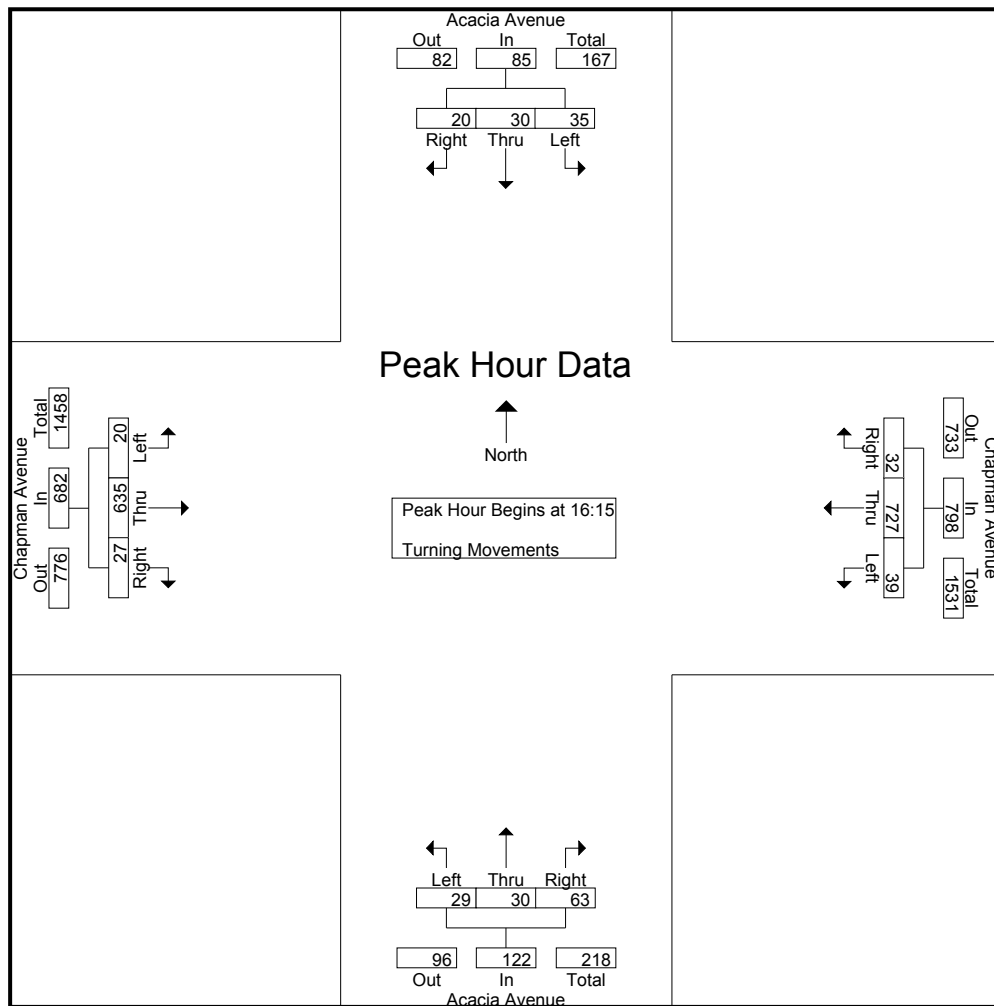
	Acacia Avenue Southbound				Chapman Avenue Westbound				Acacia Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45																	
12:45	7	4	8	19	7	214	10	231	13	10	5	28	4	143	7	154	432
13:00	8	8	3	19	6	171	10	187	13	9	7	29	7	161	3	171	406
13:15	7	4	10	21	15	204	12	231	6	6	8	20	10	168	11	189	461
13:30	9	5	7	21	15	174	12	201	11	9	12	32	15	187	2	204	458
Total Volume	31	21	28	80	43	763	44	850	43	34	32	109	36	659	23	718	1757
% App. Total	38.8	26.2	35		5.1	89.8	5.2		39.4	31.2	29.4		5	91.8	3.2		
PHF	.861	.656	.700	.952	.717	.891	.917	.920	.827	.850	.667	.852	.600	.881	.523	.880	.953



City: FULLERTON  
N-S Direction: ACACIA AVENUE  
E-W Direction: CHAPMAN AVENUE

File Name : H1711034  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	Acacia Avenue Southbound				Chapman Avenue Westbound				Acacia Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	3	5	6	14	10	206	7	223	16	6	5	27	9	147	0	156	420
16:30	0	7	9	16	6	176	7	189	18	4	11	33	4	172	7	183	421
16:45	7	6	8	21	11	179	12	202	16	12	6	34	9	154	7	170	427
17:00	10	12	12	34	5	166	13	184	13	8	7	28	5	162	6	173	419
Total Volume	20	30	35	85	32	727	39	798	63	30	29	122	27	635	20	682	1687
% App. Total	23.5	35.3	41.2		4	91.1	4.9		51.6	24.6	23.8		4	93.1	2.9		
PHF	.500	.625	.729	.625	.727	.882	.750	.895	.875	.625	.659	.897	.750	.923	.714	.932	.988



City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711035  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

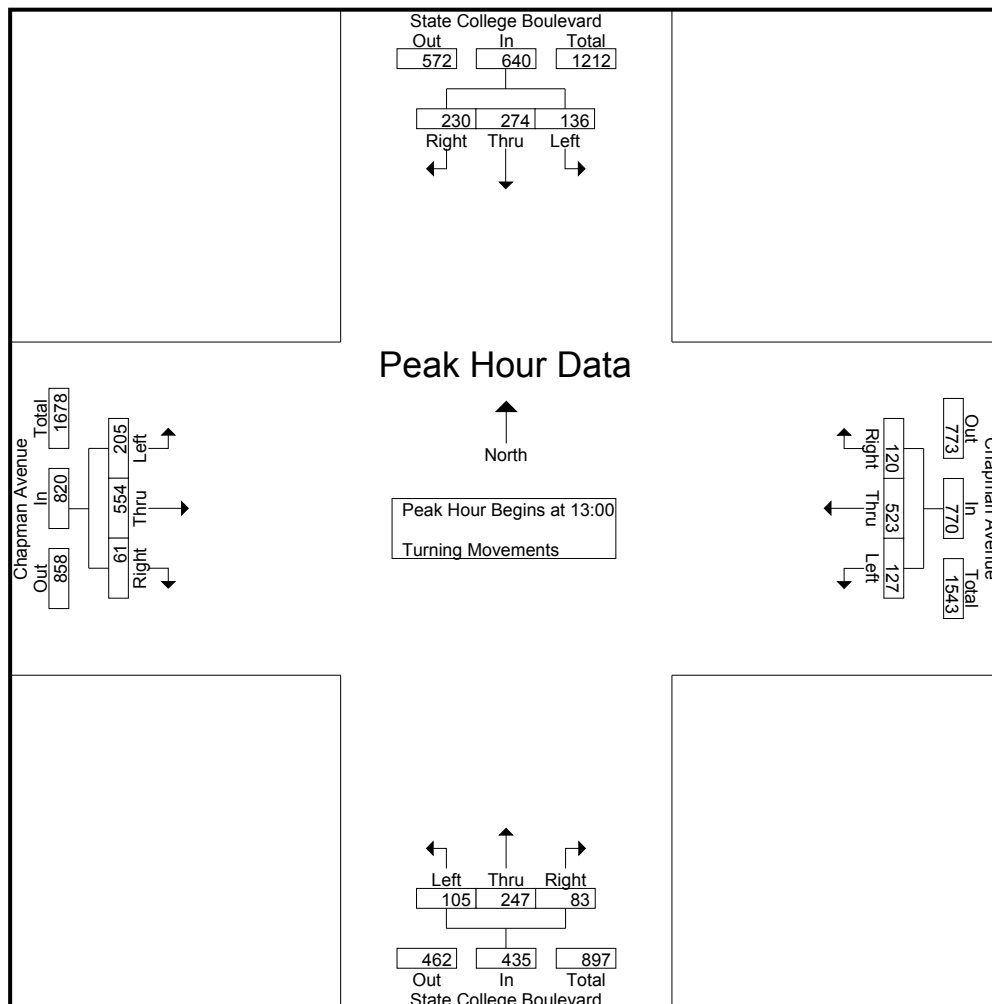
Groups Printed- Turning Movements

	State College Boulevard Southbound			Chapman Avenue Westbound			State College Boulevard Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	61	48	44	31	118	25	12	61	21	17	146	59	643
12:15	54	62	28	47	133	26	19	63	13	20	120	58	643
12:30	43	66	38	32	150	29	20	67	17	7	132	47	648
12:45	64	57	45	34	150	28	12	57	21	17	113	47	645
Total	222	233	155	144	551	108	63	248	72	61	511	211	2579
13:00	47	59	32	31	133	20	19	68	24	17	133	41	624
13:15	57	78	35	30	131	38	27	60	25	8	132	45	666
13:30	54	67	39	29	139	38	13	61	27	16	150	62	695
13:45	72	70	30	30	120	31	24	58	29	20	139	57	680
Total	230	274	136	120	523	127	83	247	105	61	554	205	2665
15:30	53	64	43	37	137	24	17	53	23	12	125	43	631
15:45	71	64	27	22	141	30	21	68	21	9	123	46	643
Total	124	128	70	59	278	54	38	121	44	21	248	89	1274
16:00	69	67	43	35	128	21	24	62	17	8	127	58	659
16:15	59	79	39	34	139	31	27	63	25	14	130	41	681
16:30	62	71	45	32	130	40	16	92	28	14	143	63	736
16:45	53	78	40	30	139	28	25	73	31	17	133	45	692
Total	243	295	167	131	536	120	92	290	101	53	533	207	2768
17:00	52	67	39	20	120	19	22	65	28	12	153	50	647
17:15	60	65	37	21	139	34	16	62	21	15	98	50	618
Grand Total	931	1062	604	495	2147	462	314	1033	371	223	2097	812	10551
Apprch %	35.8	40.9	23.3	15.9	69.2	14.9	18.3	60.1	21.6	7.1	67	25.9	
Total %	8.8	10.1	5.7	4.7	20.3	4.4	3	9.8	3.5	2.1	19.9	7.7	

City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711035  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

	State College Boulevard Southbound				Chapman Avenue Westbound				State College Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 13:00																	
13:00	47	59	32	138	31	133	20	184	19	68	24	111	17	133	41	191	624
13:15	57	78	35	170	30	131	38	199	27	60	25	112	8	132	45	185	666
13:30	54	67	39	160	29	139	38	206	13	61	27	101	16	150	62	228	695
13:45	72	70	30	172	30	120	31	181	24	58	29	111	20	139	57	216	680
Total Volume	230	274	136	640	120	523	127	770	83	247	105	435	61	554	205	820	2665
% App. Total	35.9	42.8	21.2		15.6	67.9	16.5		19.1	56.8	24.1		7.4	67.6	25		
PHF	.799	.878	.872	.930	.968	.941	.836	.934	.769	.908	.905	.971	.763	.923	.827	.899	.959

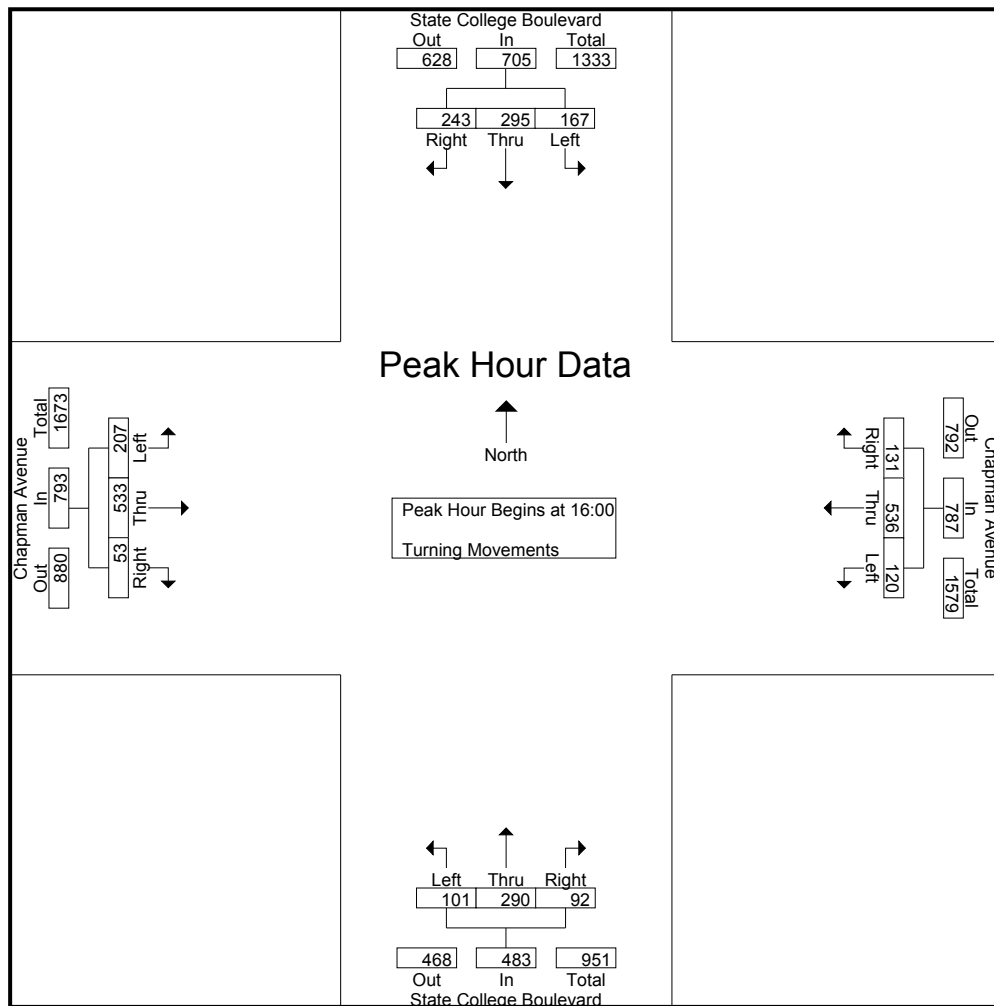




City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1711035  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	State College Boulevard Southbound				Chapman Avenue Westbound				State College Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	69	67	43	179	35	128	21	184	24	62	17	103	8	127	58	193	659
16:15	59	79	39	177	34	139	31	204	27	63	25	115	14	130	41	185	681
16:30	62	71	45	178	32	130	40	202	16	92	28	136	14	143	63	220	736
16:45	53	78	40	171	30	139	28	197	25	73	31	129	17	133	45	195	692
Total Volume	243	295	167	705	131	536	120	787	92	290	101	483	53	533	207	793	2768
% App. Total	34.5	41.8	23.7		16.6	68.1	15.2		19	60	20.9		6.7	67.2	26.1		
PHF	.880	.934	.928	.985	.936	.964	.750	.964	.852	.788	.815	.888	.779	.932	.821	.901	.940



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711036  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

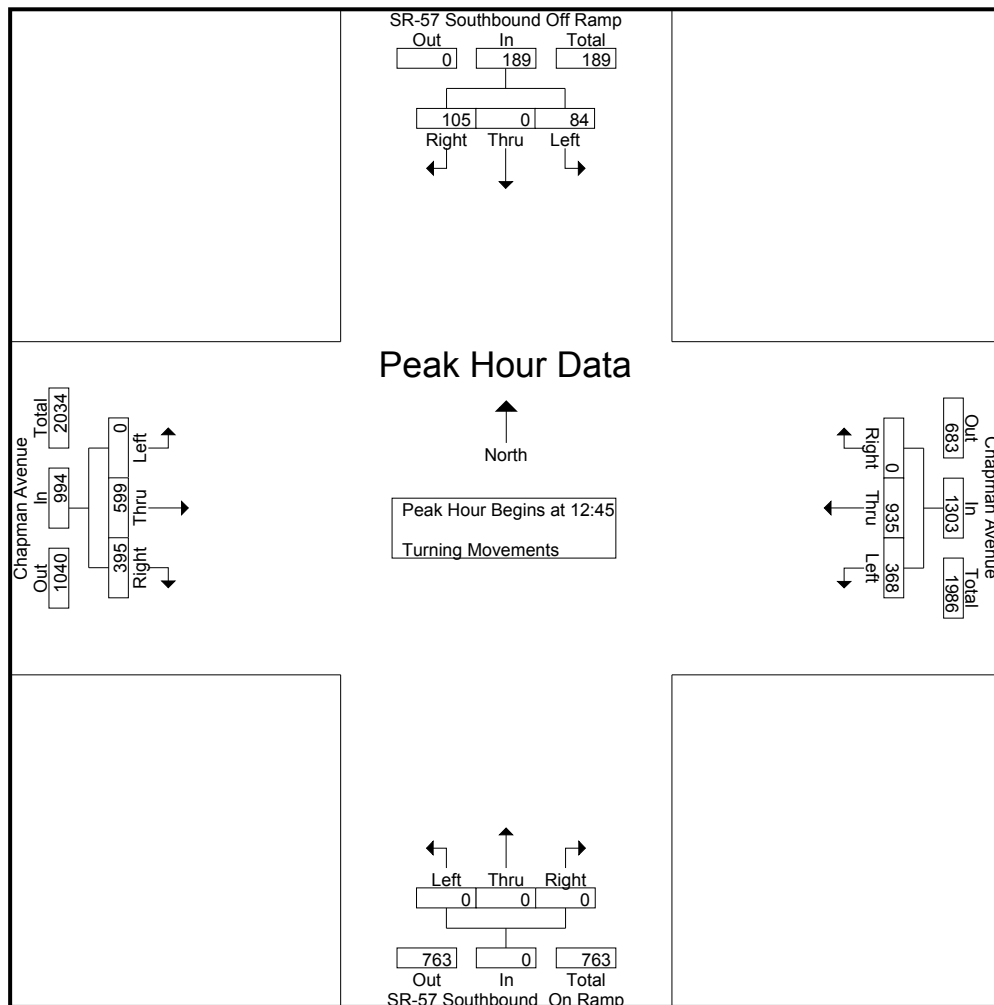
Groups Printed- Turning Movements

	SR-57 Southbound Off Ramp Southbound			Chapman Avenue Westbound			SR-57 Southbound On Ramp Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	24	0	16	0	226	92	0	0	0	92	138	0	588
12:15	25	0	19	0	232	92	0	0	0	86	146	0	600
12:30	28	0	22	0	249	92	0	0	0	88	153	0	632
12:45	31	0	15	0	230	111	0	0	0	91	140	0	618
Total	108	0	72	0	937	387	0	0	0	357	577	0	2438
13:00	27	0	25	0	225	72	0	0	0	107	146	0	602
13:15	23	0	22	0	240	79	0	0	0	92	176	0	632
13:30	24	0	22	0	240	106	0	0	0	105	137	0	634
13:45	30	0	22	0	219	74	0	0	0	103	164	0	612
Total	104	0	91	0	924	331	0	0	0	407	623	0	2480
15:30	34	0	19	0	195	99	0	0	0	90	173	0	610
15:45	25	0	20	0	208	95	0	0	0	103	147	0	598
Total	59	0	39	0	403	194	0	0	0	193	320	0	1208
16:00	25	0	23	0	195	86	0	0	0	111	155	0	595
16:15	19	0	22	0	203	106	0	0	0	103	147	0	600
16:30	33	0	22	0	218	77	0	0	0	99	175	0	624
16:45	23	0	15	0	195	70	0	0	0	107	151	0	561
Total	100	0	82	0	811	339	0	0	0	420	628	0	2380
17:00	26	0	22	0	194	85	0	0	0	111	164	0	602
17:15	30	0	21	0	245	74	0	0	0	78	147	0	595
Grand Total	427	0	327	0	3514	1410	0	0	0	1566	2459	0	9703
Apprch %	56.6	0	43.4	0	71.4	28.6	0	0	0	38.9	61.1	0	
Total %	4.4	0	3.4	0	36.2	14.5	0	0	0	16.1	25.3	0	

City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711036  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

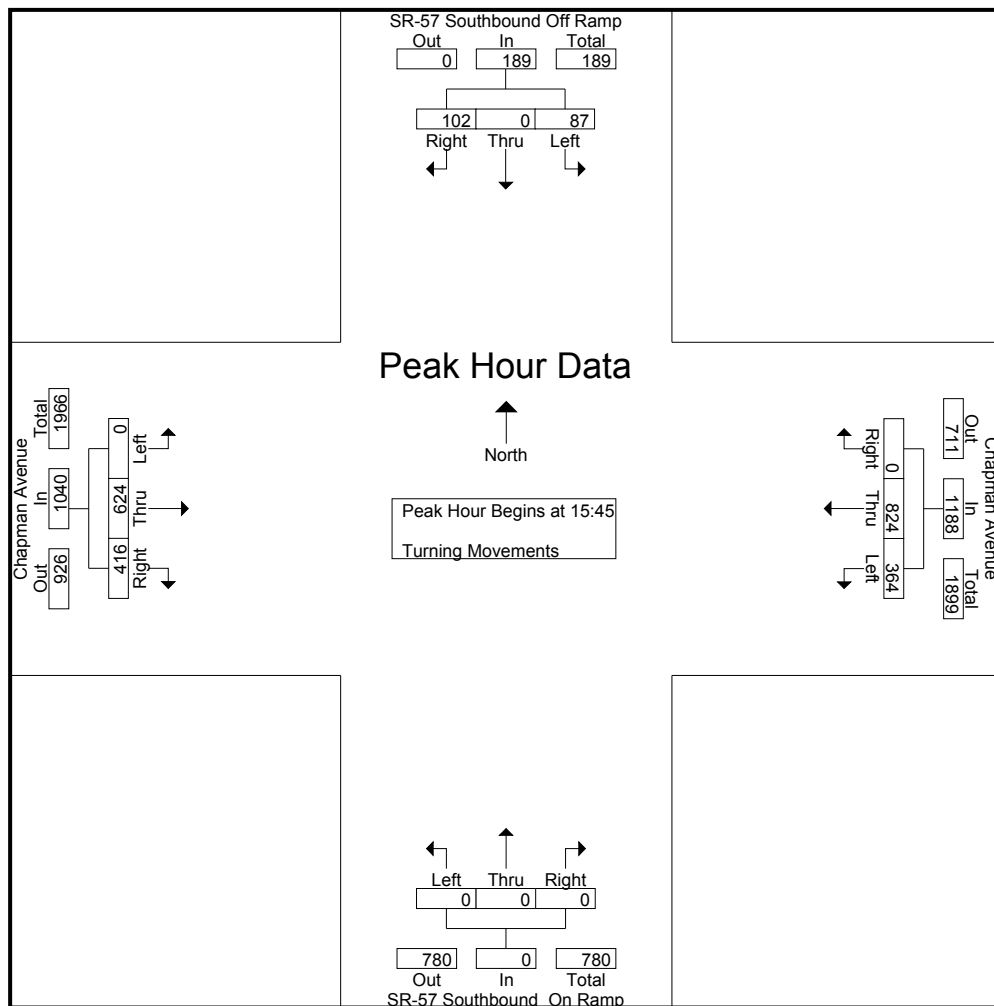
	SR-57 Southbound Off Ramp Southbound				Chapman Avenue Westbound				SR-57 Southbound On Ramp Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45																	
12:45	31	0	15	46	0	230	111	341	0	0	0	0	91	140	0	231	618
13:00	27	0	25	52	0	225	72	297	0	0	0	0	107	146	0	253	602
13:15	23	0	22	45	0	240	79	319	0	0	0	0	92	176	0	268	632
13:30	24	0	22	46	0	240	106	346	0	0	0	0	105	137	0	242	634
Total Volume	105	0	84	189	0	935	368	1303	0	0	0	0	395	599	0	994	2486
% App. Total	55.6	0	44.4		0	71.8	28.2		0	0	0		39.7	60.3	0		
PHF	.847	.000	.840	.909	.000	.974	.829	.941	.000	.000	.000	.000	.923	.851	.000	.927	.980



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711036  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	SR-57 Southbound Off Ramp Southbound				Chapman Avenue Westbound				SR-57 Southbound On Ramp Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:45																	
15:45	25	0	20	45	0	208	95	303	0	0	0	0	103	147	0	250	598
16:00	25	0	23	48	0	195	86	281	0	0	0	0	111	155	0	266	595
16:15	19	0	22	41	0	203	106	309	0	0	0	0	103	147	0	250	600
16:30	33	0	22	55	0	218	77	295	0	0	0	0	99	175	0	274	624
Total Volume	102	0	87	189	0	824	364	1188	0	0	0	0	416	624	0	1040	2417
% App. Total	54	0	46		0	69.4	30.6		0	0	0		40	60	0		
PHF	.773	.000	.946	.859	.000	.945	.858	.961	.000	.000	.000	.000	.937	.891	.000	.949	.968



City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711037  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 1

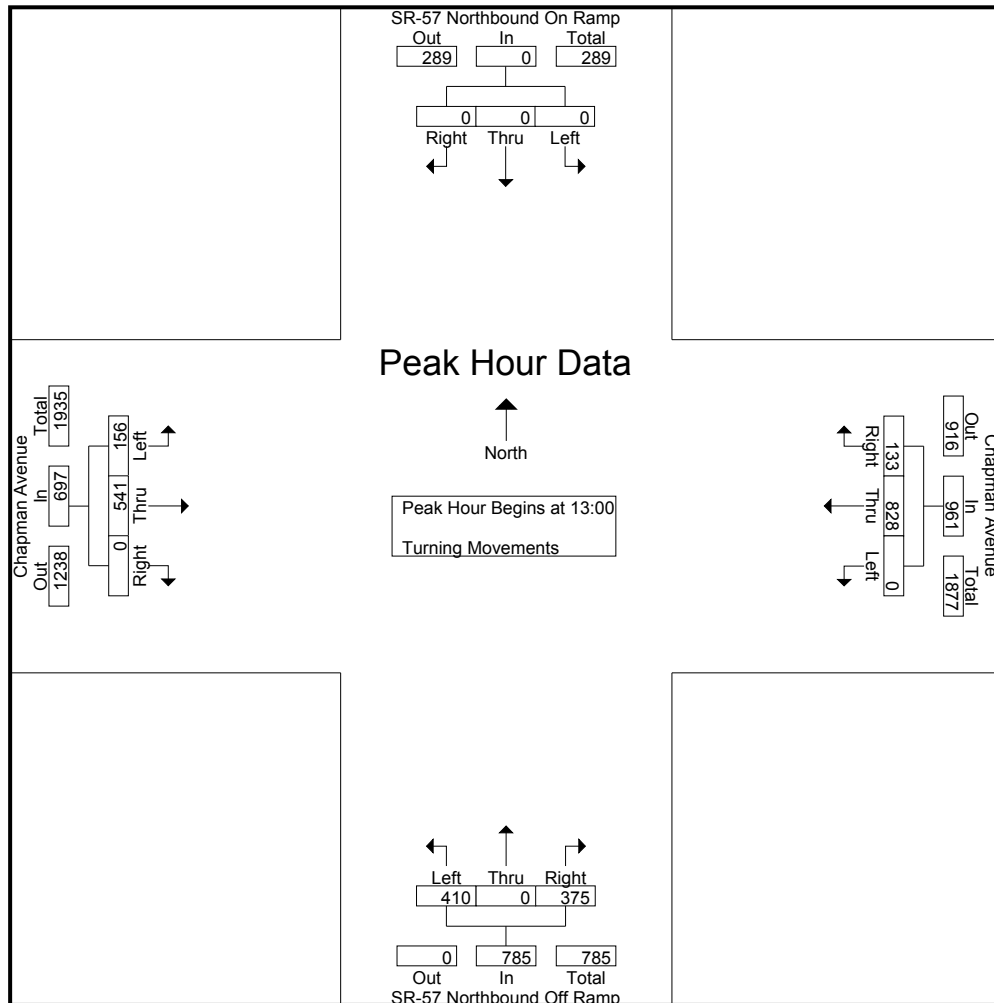
Groups Printed- Turning Movements

	SR-57 Northbound On Ramp Southbound			Chapman Avenue Westbound			SR-57 Northbound Off Ramp Northbound			Chapman Avenue Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	0	0	34	216	0	79	0	96	0	125	31	581
12:15	0	0	0	24	217	0	58	0	104	0	129	34	566
12:30	0	0	0	30	216	0	53	0	125	0	134	36	594
12:45	0	0	0	32	225	0	77	0	113	0	113	34	594
Total	0	0	0	120	874	0	267	0	438	0	501	135	2335
13:00	0	0	0	26	204	0	87	0	93	0	133	31	574
13:15	0	0	0	33	202	0	90	0	112	0	153	45	635
13:30	0	0	0	30	227	0	81	0	116	0	121	34	609
13:45	0	0	0	44	195	0	117	0	89	0	134	46	625
Total	0	0	0	133	828	0	375	0	410	0	541	156	2443
15:30	0	0	0	42	205	0	99	0	93	0	153	44	636
15:45	0	0	0	39	210	0	69	0	100	0	140	31	589
Total	0	0	0	81	415	0	168	0	193	0	293	75	1225
16:00	0	0	0	41	173	0	79	0	108	0	136	41	578
16:15	0	0	0	40	187	0	83	0	113	0	129	42	594
16:30	0	0	0	38	178	0	89	0	110	0	147	54	616
16:45	0	0	0	37	165	0	103	0	97	0	136	36	574
Total	0	0	0	156	703	0	354	0	428	0	548	173	2362
17:00	0	0	0	35	187	0	92	0	95	0	140	44	593
17:15	0	0	0	27	210	0	103	0	118	0	124	48	630
Grand Total	0	0	0	552	3217	0	1359	0	1682	0	2147	631	9588
Apprch %	0	0	0	14.6	85.4	0	44.7	0	55.3	0	77.3	22.7	
Total %	0	0	0	5.8	33.6	0	14.2	0	17.5	0	22.4	6.6	

City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711037  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 2

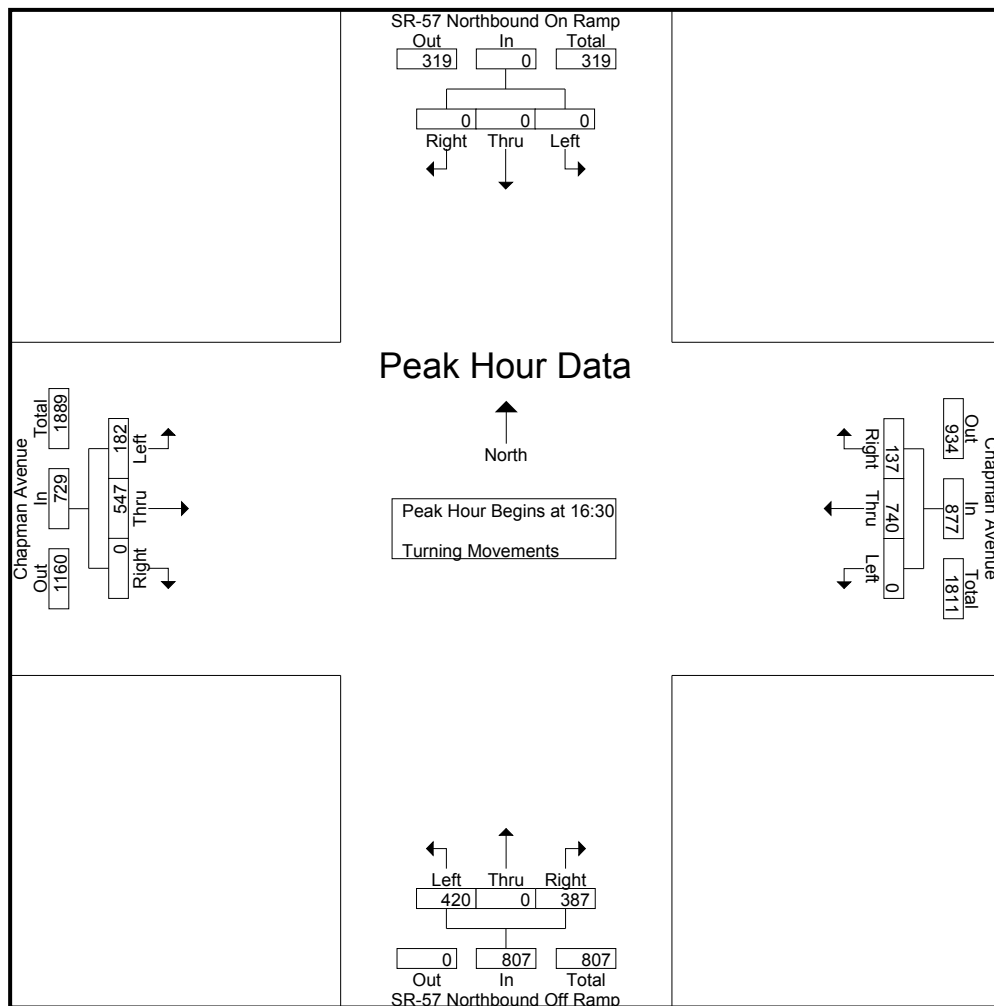
	SR-57 Northbound On Ramp Southbound				Chapman Avenue Westbound				SR-57 Northbound Off Ramp Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 13:00																	
13:00	0	0	0	0	26	204	0	230	87	0	93	180	0	133	31	164	574
13:15	0	0	0	0	33	202	0	235	90	0	112	202	0	153	45	198	635
13:30	0	0	0	0	30	227	0	257	81	0	116	197	0	121	34	155	609
13:45	0	0	0	0	44	195	0	239	117	0	89	206	0	134	46	180	625
Total Volume	0	0	0	0	133	828	0	961	375	0	410	785	0	541	156	697	2443
% App. Total	0	0	0	0	13.8	86.2	0		47.8	0	52.2		0	77.6	22.4		
PHF	.000	.000	.000	.000	.756	.912	.000	.935	.801	.000	.884	.953	.000	.884	.848	.880	.962



City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1711037  
Site Code : 07117766  
Start Date : 11/4/2017  
Page No : 3

	SR-57 Northbound On Ramp Southbound				Chapman Avenue Westbound				SR-57 Northbound Off Ramp Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	0	0	0	38	178	0	216	89	0	110	199	0	147	54	201	616
16:45	0	0	0	0	37	165	0	202	103	0	97	200	0	136	36	172	574
17:00	0	0	0	0	35	187	0	222	92	0	95	187	0	140	44	184	593
17:15	0	0	0	0	27	210	0	237	103	0	118	221	0	124	48	172	630
Total Volume	0	0	0	0	137	740	0	877	387	0	420	807	0	547	182	729	2413
% App. Total	0	0	0	0	15.6	84.4	0		48	0	52		0	75	25		
PHF	.000	.000	.000	.000	.901	.881	.000	.925	.939	.000	.890	.913	.000	.930	.843	.907	.958



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1711038  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

Groups Printed- Turning Movements

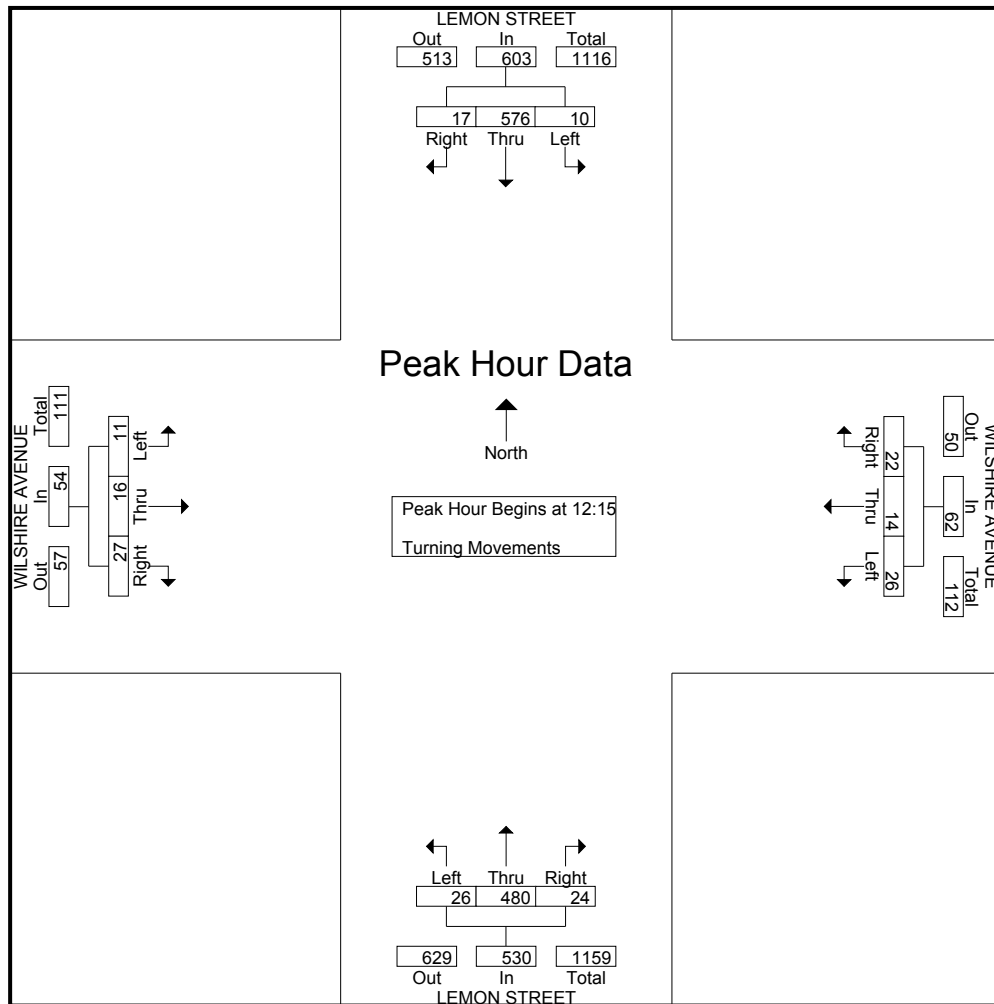
	LEMON STREET Southbound			WILSHIRE AVENUE Westbound			LEMON STREET Northbound			WILSHIRE AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	3	122	1	8	6	4	4	127	10	9	2	0	296
12:15	7	155	1	7	1	9	7	141	9	5	1	8	351
12:30	3	140	2	1	5	3	6	127	6	7	3	2	305
12:45	5	129	1	8	5	4	7	87	5	8	4	0	263
Total	18	546	5	24	17	20	24	482	30	29	10	10	1215
13:00	2	152	6	6	3	10	4	125	6	7	8	1	330
13:15	11	98	7	5	8	9	4	125	6	6	5	4	288
13:30	3	122	3	6	3	14	5	111	5	9	3	3	287
13:45	4	119	0	5	7	10	5	120	5	10	4	0	289
Total	20	491	16	22	21	43	18	481	22	32	20	8	1194
*** BREAK ***													
15:30	5	159	2	2	4	1	5	108	5	10	1	2	304
15:45	3	130	3	3	3	3	6	117	6	2	5	5	286
Total	8	289	5	5	7	4	11	225	11	12	6	7	590
16:00	0	122	4	2	2	5	3	117	4	9	3	2	273
16:15	1	127	3	4	4	1	2	97	9	7	3	2	260
16:30	2	139	1	1	1	3	2	107	6	6	4	2	274
16:45	5	132	0	3	1	0	3	115	4	6	3	0	272
Total	8	520	8	10	8	9	10	436	23	28	13	6	1079
17:00	7	137	4	1	6	1	4	94	4	4	4	1	267
17:15	3	112	3	1	2	2	3	107	5	6	4	1	249
Grand Total	64	2095	41	63	61	79	70	1825	95	111	57	33	4594
Apprch %	2.9	95.2	1.9	31	30	38.9	3.5	91.7	4.8	55.2	28.4	16.4	
Total %	1.4	45.6	0.9	1.4	1.3	1.7	1.5	39.7	2.1	2.4	1.2	0.7	



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1711038  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

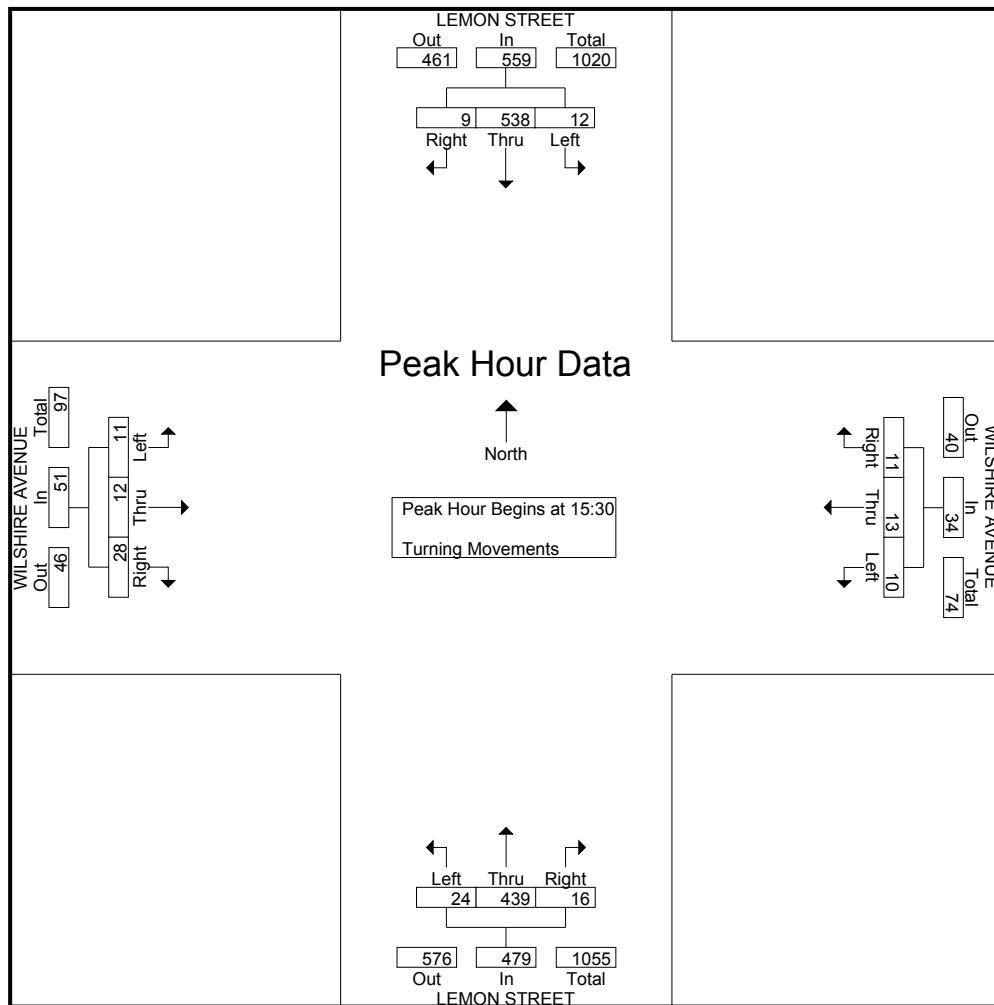
	LEMON STREET Southbound				WILSHIRE AVENUE Westbound				LEMON STREET Northbound				WILSHIRE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	7	155	1	163	7	1	9	17	7	141	9	157	5	1	8	14	351
12:30	3	140	2	145	1	5	3	9	6	127	6	139	7	3	2	12	305
12:45	5	129	1	135	8	5	4	17	7	87	5	99	8	4	0	12	263
13:00	2	152	6	160	6	3	10	19	4	125	6	135	7	8	1	16	330
Total Volume	17	576	10	603	22	14	26	62	24	480	26	530	27	16	11	54	1249
% App. Total	2.8	95.5	1.7		35.5	22.6	41.9		4.5	90.6	4.9		50	29.6	20.4		
PHF	.607	.929	.417	.925	.688	.700	.650	.816	.857	.851	.722	.844	.844	.500	.344	.844	.890



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1711038  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				WILSHIRE AVENUE Westbound				LEMON STREET Northbound				WILSHIRE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	5	159	2	166	2	4	1	7	5	108	5	118	10	1	2	13	304
15:45	3	130	3	136	3	3	3	9	6	117	6	129	2	5	5	12	286
16:00	0	122	4	126	2	2	5	9	3	117	4	124	9	3	2	14	273
16:15	1	127	3	131	4	4	1	9	2	97	9	108	7	3	2	12	260
Total Volume	9	538	12	559	11	13	10	34	16	439	24	479	28	12	11	51	1123
% App. Total	1.6	96.2	2.1		32.4	38.2	29.4		3.3	91.6	5		54.9	23.5	21.6		
PHF	.450	.846	.750	.842	.688	.813	.500	.944	.667	.938	.667	.928	.700	.600	.550	.911	.924



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711039  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

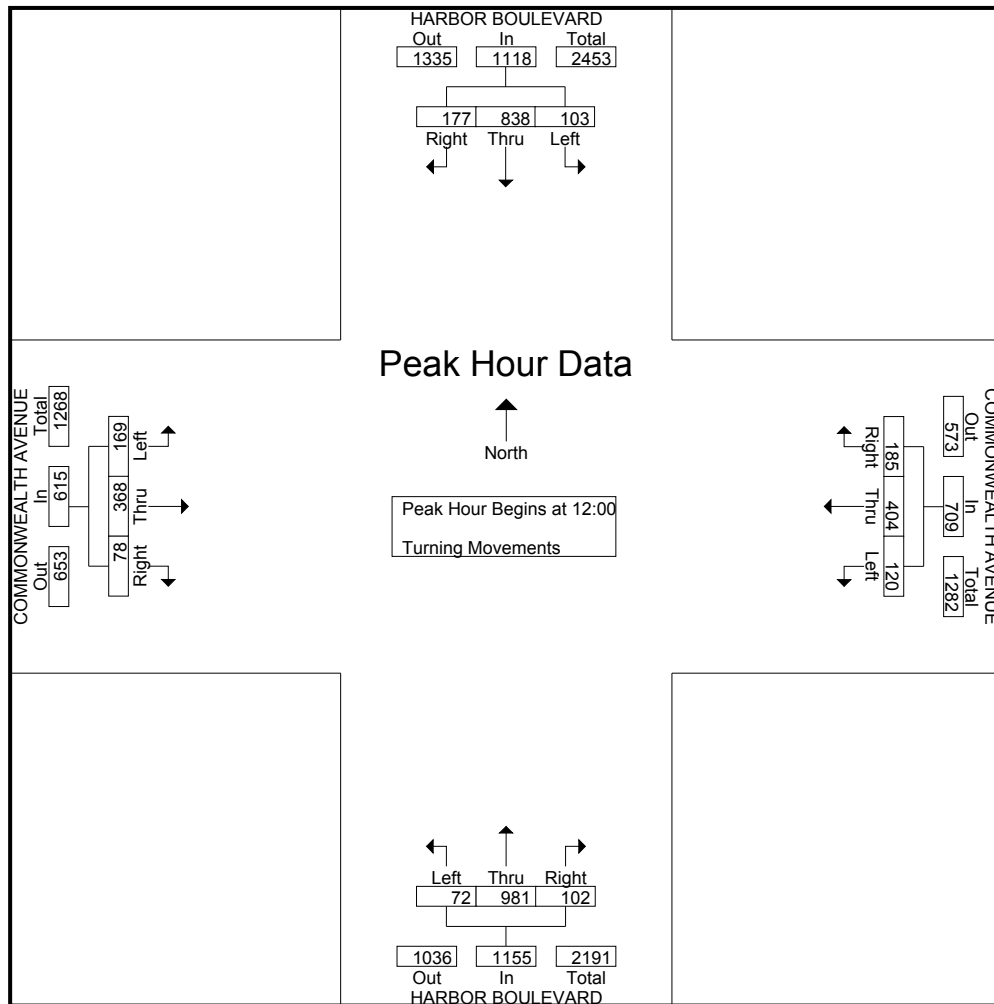
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			COMMONWEALTH AVENUE Westbound			HARBOR BOULEVARD Northbound			COMMONWEALTH AVENUE Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	33	212	26	41	118	29	22	251	17	20	92	50	911
12:15	54	199	22	45	91	35	25	245	18	20	103	45	902
12:30	37	223	25	52	94	29	32	255	20	13	81	43	904
12:45	53	204	30	47	101	27	23	230	17	25	92	31	880
Total	177	838	103	185	404	120	102	981	72	78	368	169	3597
13:00	38	229	41	35	95	19	27	254	14	20	105	32	909
13:15	37	203	24	39	70	17	27	239	21	24	86	36	823
13:30	45	180	20	39	94	42	21	258	11	6	126	38	880
13:45	53	195	14	43	75	38	26	277	19	15	100	37	892
Total	173	807	99	156	334	116	101	1028	65	65	417	143	3504
*** BREAK ***													
15:30	44	203	28	29	78	28	20	250	19	19	85	57	860
15:45	45	226	26	33	78	31	18	194	15	19	98	43	826
Total	89	429	54	62	156	59	38	444	34	38	183	100	1686
16:00	37	206	25	22	85	31	22	199	8	10	89	32	766
16:15	23	226	22	40	80	22	19	218	10	17	86	37	800
16:30	36	223	18	35	90	31	19	228	14	9	75	35	813
16:45	29	211	21	39	75	28	19	232	15	15	79	37	800
Total	125	866	86	136	330	112	79	877	47	51	329	141	3179
17:00	42	220	26	37	74	21	20	219	15	18	89	43	824
17:15	49	212	12	33	92	19	12	221	16	21	92	46	825
Grand Total	655	3372	380	609	1390	447	352	3770	249	271	1478	642	13615
Apprch %	14.9	76.5	8.6	24.9	56.8	18.3	8.1	86.3	5.7	11.3	61.8	26.9	
Total %	4.8	24.8	2.8	4.5	10.2	3.3	2.6	27.7	1.8	2	10.9	4.7	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711039  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

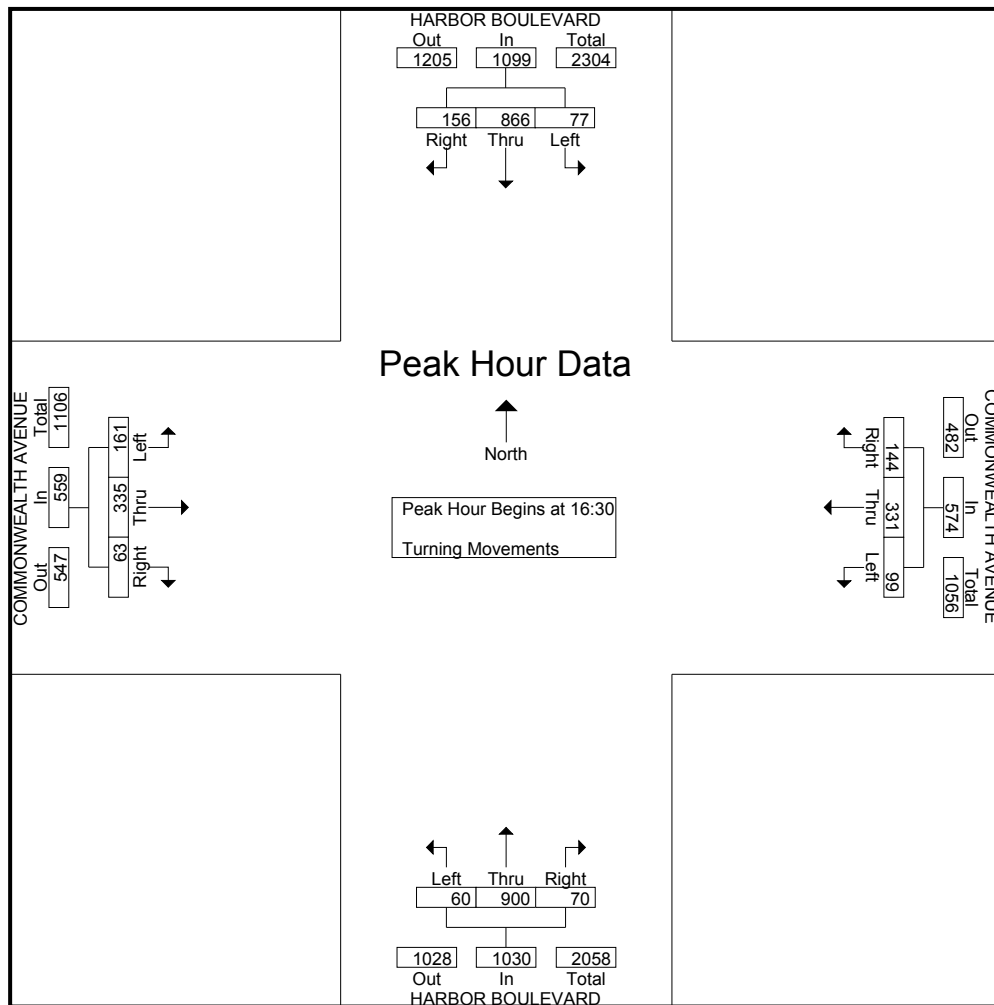
	HARBOR BOULEVARD Southbound				COMMONWEALTH AVENUE Westbound				HARBOR BOULEVARD Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	33	212	26	271	41	<b>118</b>	29	<b>188</b>	22	251	17	290	20	92	<b>50</b>	162	<b>911</b>
12:15	<b>54</b>	199	22	275	45	91	<b>35</b>	171	25	245	18	288	20	<b>103</b>	45	<b>168</b>	902
12:30	37	<b>223</b>	25	285	<b>52</b>	94	29	175	<b>32</b>	<b>255</b>	<b>20</b>	<b>307</b>	13	81	43	137	904
12:45	53	204	<b>30</b>	<b>287</b>	47	101	27	175	23	230	17	270	<b>25</b>	92	31	148	880
Total Volume	177	838	103	1118	185	404	120	709	102	981	72	1155	78	368	169	615	3597
% App. Total	15.8	75	9.2		26.1	57	16.9		8.8	84.9	6.2		12.7	59.8	27.5		
PHF	.819	.939	.858	.974	.889	.856	.857	.943	.797	.962	.900	.941	.780	.893	.845	.915	.987



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711039  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				COMMONWEALTH AVENUE Westbound				HARBOR BOULEVARD Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	36	223	18	277	35	90	31	156	19	228	14	261	9	75	35	119	813
16:45	29	211	21	261	39	75	28	142	19	232	15	266	15	79	37	131	800
17:00	42	220	26	288	37	74	21	132	20	219	15	254	18	89	43	150	824
17:15	49	212	12	273	33	92	19	144	12	221	16	249	21	92	46	159	825
Total Volume	156	866	77	1099	144	331	99	574	70	900	60	1030	63	335	161	559	3262
% App. Total	14.2	78.8	7		25.1	57.7	17.2		6.8	87.4	5.8		11.3	59.9	28.8		
PHF	.796	.971	.740	.954	.923	.899	.798	.920	.875	.970	.938	.968	.750	.910	.875	.879	.988



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711040  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

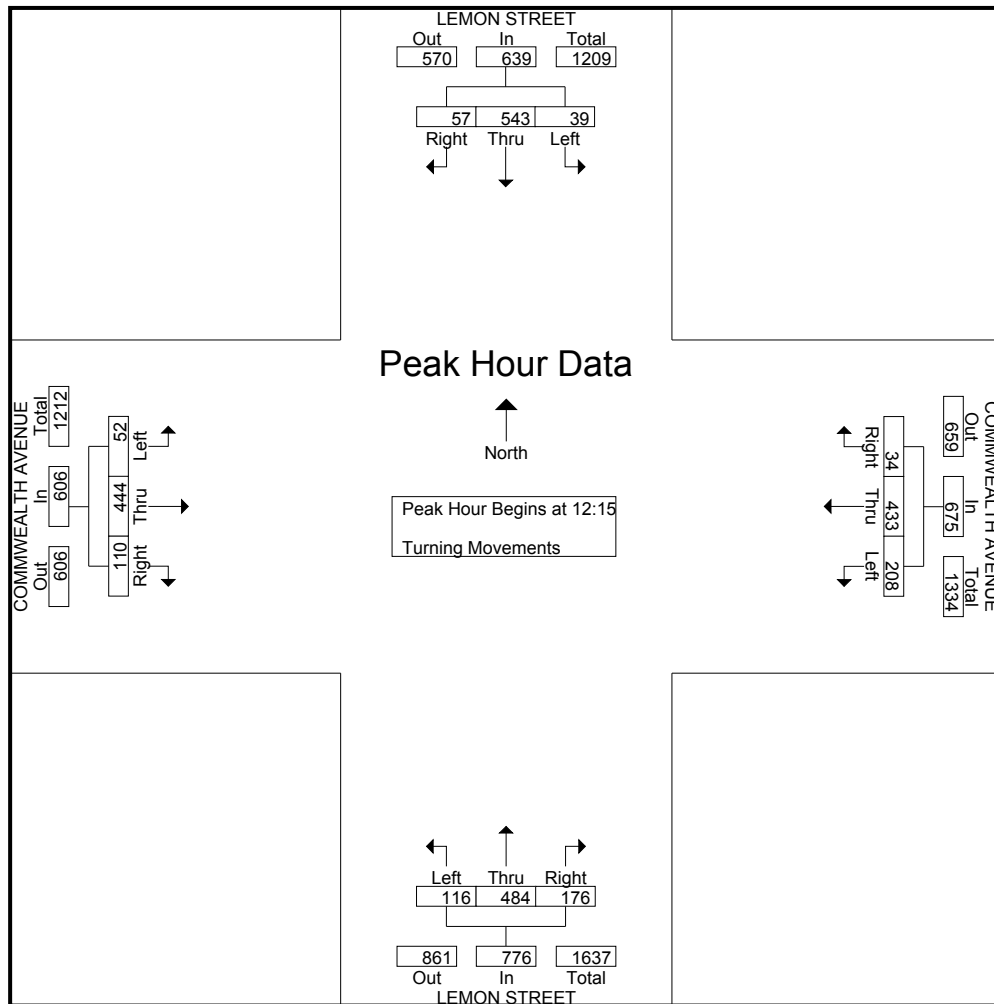
Groups Printed- Turning Movements

	LEMON STREET Southbound			COMMONWEALTH AVENUE Westbound			LEMON STREET Northbound			COMMONWEALTH AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	16	109	7	14	116	59	47	118	33	31	108	16	674
12:15	16	158	9	10	120	63	44	132	25	28	119	12	736
12:30	15	119	8	8	95	40	43	131	20	29	87	12	607
12:45	12	120	12	8	109	51	45	88	35	28	127	13	648
Total	59	506	36	40	440	213	179	469	113	116	441	53	2665
13:00	14	146	10	8	109	54	44	133	36	25	111	15	705
13:15	14	108	11	6	95	50	36	111	30	12	81	12	566
13:30	15	125	12	6	116	57	35	105	31	31	104	10	647
13:45	8	116	9	10	108	46	52	110	22	27	119	8	635
Total	51	495	42	30	428	207	167	459	119	95	415	45	2553
*** BREAK ***													
15:30	18	132	6	11	101	50	51	108	22	18	100	7	624
15:45	15	139	4	6	109	55	45	103	41	21	88	14	640
Total	33	271	10	17	210	105	96	211	63	39	188	21	1264
16:00	9	110	12	2	97	45	51	109	25	20	112	9	601
16:15	8	121	6	6	102	55	46	105	24	28	89	6	596
16:30	9	125	7	8	98	48	40	95	20	29	83	9	571
16:45	10	142	5	9	90	54	39	101	19	33	77	7	586
Total	36	498	30	25	387	202	176	410	88	110	361	31	2354
17:00	13	128	8	4	104	51	45	79	32	30	99	10	603
17:15	18	101	9	7	109	43	43	96	22	31	102	10	591
Grand Total	210	1999	135	123	1678	821	706	1724	437	421	1606	170	10030
Apprch %	9	85.3	5.8	4.7	64	31.3	24.6	60.1	15.2	19.2	73.1	7.7	
Total %	2.1	19.9	1.3	1.2	16.7	8.2	7	17.2	4.4	4.2	16	1.7	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711040  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

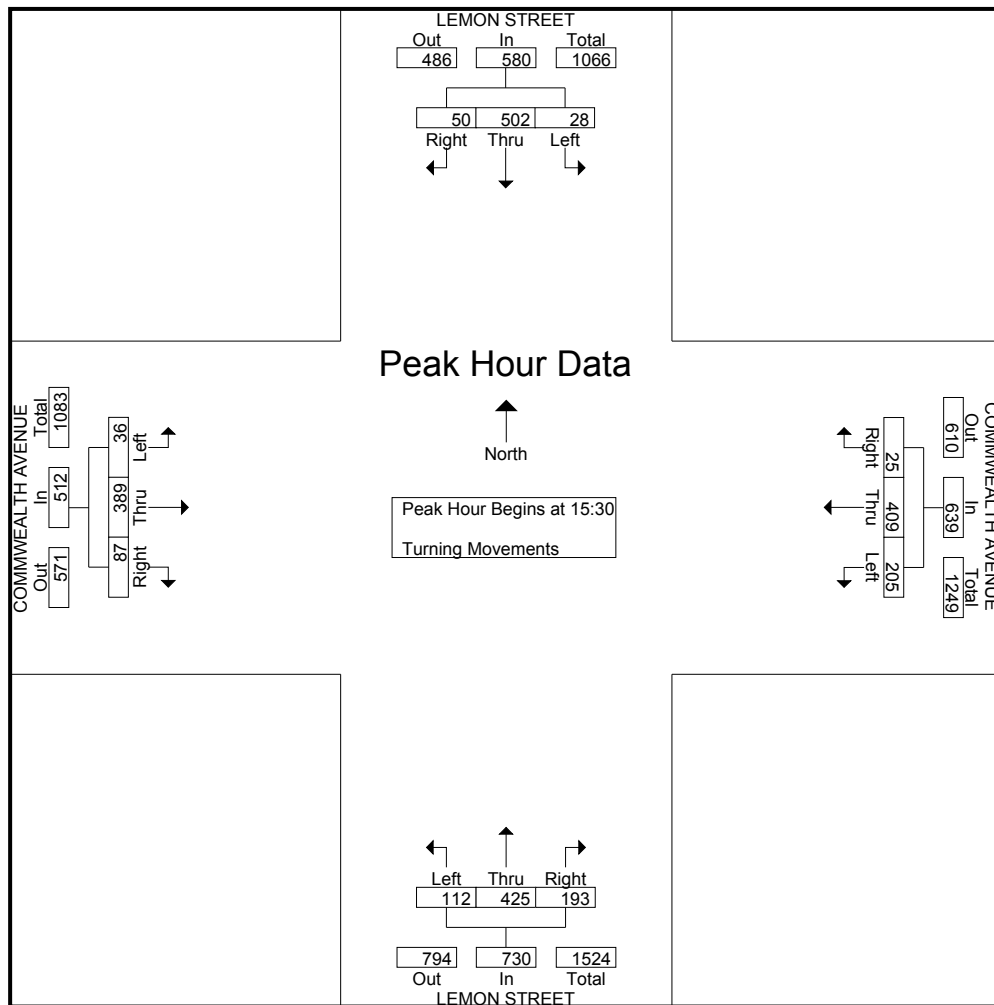
	LEMON STREET Southbound				COMMONWEALTH AVENUE Westbound				LEMON STREET Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	16	158	9	183	10	120	63	193	44	132	25	201	28	119	12	159	736
12:30	15	119	8	142	8	95	40	143	43	131	20	194	29	87	12	128	607
12:45	12	120	12	144	8	109	51	168	45	88	35	168	28	127	13	168	648
13:00	14	146	10	170	8	109	54	171	44	133	36	213	25	111	15	151	705
Total Volume	57	543	39	639	34	433	208	675	176	484	116	776	110	444	52	606	2696
% App. Total	8.9	85	6.1		5	64.1	30.8		22.7	62.4	14.9		18.2	73.3	8.6		
PHF	.891	.859	.813	.873	.850	.902	.825	.874	.978	.910	.806	.911	.948	.874	.867	.902	.916



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1711040  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				COMMONWEALTH AVENUE Westbound				LEMON STREET Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	18	132	6	156	11	101	50	162	51	108	22	181	18	100	7	125	624
15:45	15	139	4	158	6	109	55	170	45	103	41	189	21	88	14	123	640
16:00	9	110	12	131	2	97	45	144	51	109	25	185	20	112	9	141	601
16:15	8	121	6	135	6	102	55	163	46	105	24	175	28	89	6	123	596
Total Volume	50	502	28	580	25	409	205	639	193	425	112	730	87	389	36	512	2461
% App. Total	8.6	86.6	4.8		3.9	64	32.1		26.4	58.2	15.3		17	76	7		
PHF	.694	.903	.583	.918	.568	.938	.932	.940	.946	.975	.683	.966	.777	.868	.643	.908	.961





City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1711041  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

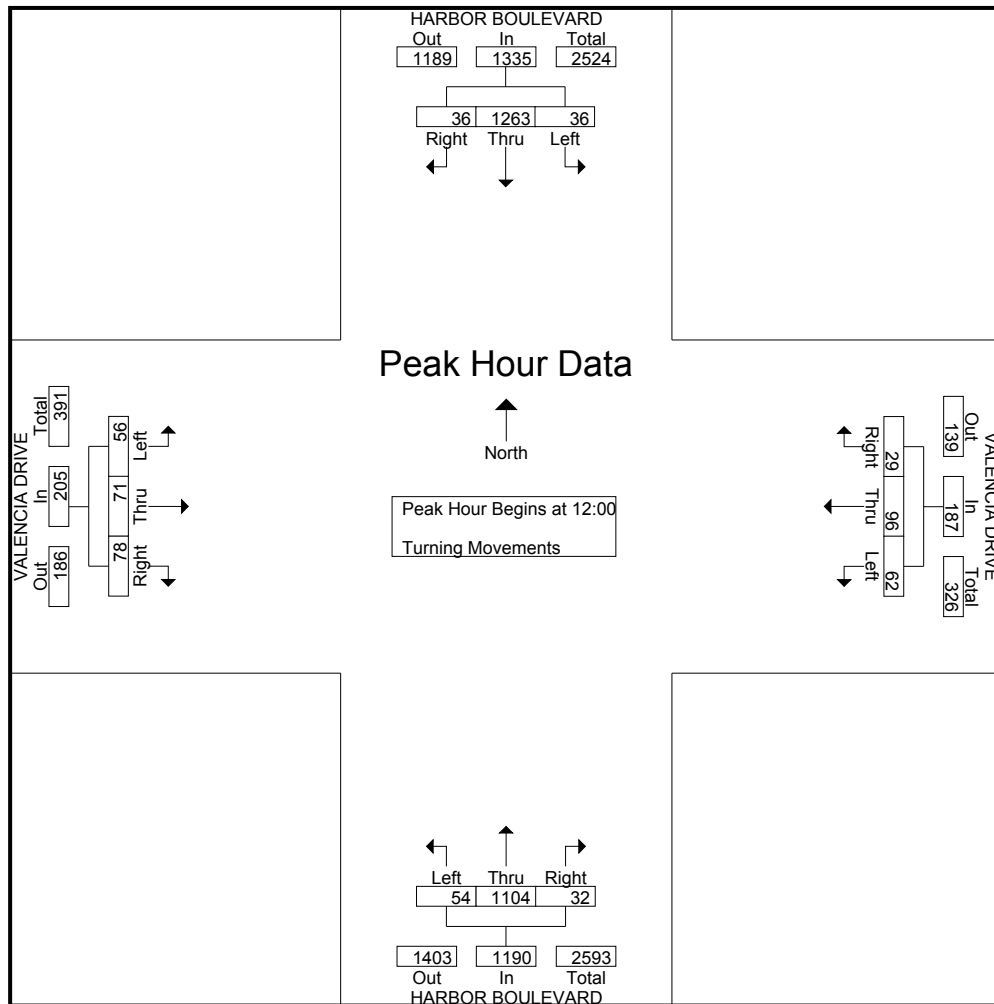
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			VALENCIA DRIVE Westbound			HARBOR BOULEVARD Northbound			VALENCIA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	7	302	10	10	29	14	11	274	14	20	24	13	728
12:15	10	318	12	8	24	19	5	269	15	24	17	13	734
12:30	13	335	7	5	23	15	9	283	13	16	18	14	751
12:45	6	308	7	6	20	14	7	278	12	18	12	16	704
Total	36	1263	36	29	96	62	32	1104	54	78	71	56	2917
13:00	10	298	6	5	22	19	8	278	11	22	10	15	704
13:15	7	321	2	8	26	18	14	262	11	24	16	8	717
13:30	11	305	6	1	20	17	10	265	16	20	18	14	703
13:45	8	344	5	8	16	14	9	259	18	15	20	15	731
Total	36	1268	19	22	84	68	41	1064	56	81	64	52	2855
*** BREAK ***													
15:30	8	327	8	8	18	15	15	264	12	14	13	12	714
15:45	5	256	11	6	20	16	7	275	17	17	11	17	658
Total	13	583	19	14	38	31	22	539	29	31	24	29	1372
16:00	4	265	6	3	17	19	8	272	12	21	9	12	648
16:15	4	289	3	4	22	21	6	279	12	13	19	8	680
16:30	10	291	3	4	24	18	8	286	18	18	19	7	706
16:45	6	288	5	7	14	16	11	273	17	22	22	13	694
Total	24	1133	17	18	77	74	33	1110	59	74	69	40	2728
17:00	5	303	5	7	23	13	9	281	16	22	22	8	714
17:15	7	288	9	2	9	14	7	270	12	14	13	14	659
Grand Total	121	4838	105	92	327	262	144	4368	226	300	263	199	11245
Apprch %	2.4	95.5	2.1	13.5	48	38.5	3	92.2	4.8	39.4	34.5	26.1	
Total %	1.1	43	0.9	0.8	2.9	2.3	1.3	38.8	2	2.7	2.3	1.8	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1711041  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

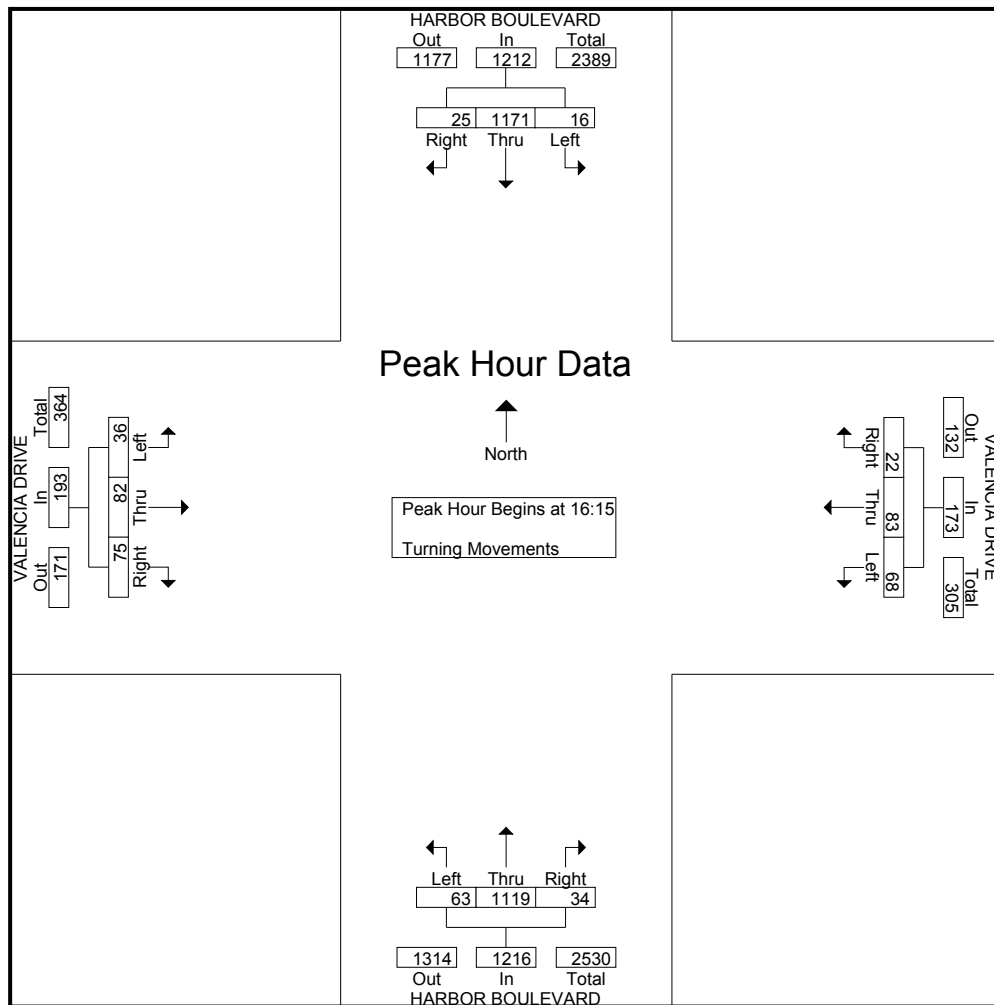
	HARBOR BOULEVARD Southbound				VALENCIA DRIVE Westbound				HARBOR BOULEVARD Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	7	302	10	319	10	29	14	53	11	274	14	299	20	24	13	57	728
12:15	10	318	12	340	8	24	19	51	5	269	15	289	24	17	13	54	734
12:30	13	335	7	355	5	23	15	43	9	283	13	305	16	18	14	48	751
12:45	6	308	7	321	6	20	14	40	7	278	12	297	18	12	16	46	704
Total Volume	36	1263	36	1335	29	96	62	187	32	1104	54	1190	78	71	56	205	2917
% App. Total	2.7	94.6	2.7		15.5	51.3	33.2		2.7	92.8	4.5		38	34.6	27.3		
PHF	.692	.943	.750	.940	.725	.828	.816	.882	.727	.975	.900	.975	.813	.740	.875	.899	.971



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1711041  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				VALENCIA DRIVE Westbound				HARBOR BOULEVARD Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	4	289	3	296	4	22	21	47	6	279	12	297	13	19	8	40	680
16:30	10	291	3	304	4	24	18	46	8	286	18	312	18	19	7	44	706
16:45	6	288	5	299	7	14	16	37	11	273	17	301	22	22	13	57	694
17:00	5	303	5	313	7	23	13	43	9	281	16	306	22	22	8	52	714
Total Volume	25	1171	16	1212	22	83	68	173	34	1119	63	1216	75	82	36	193	2794
% App. Total	2.1	96.6	1.3		12.7	48	39.3		2.8	92	5.2		38.9	42.5	18.7		
PHF	.625	.966	.800	.968	.786	.865	.810	.920	.773	.978	.875	.974	.852	.932	.692	.846	.978



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1711042  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

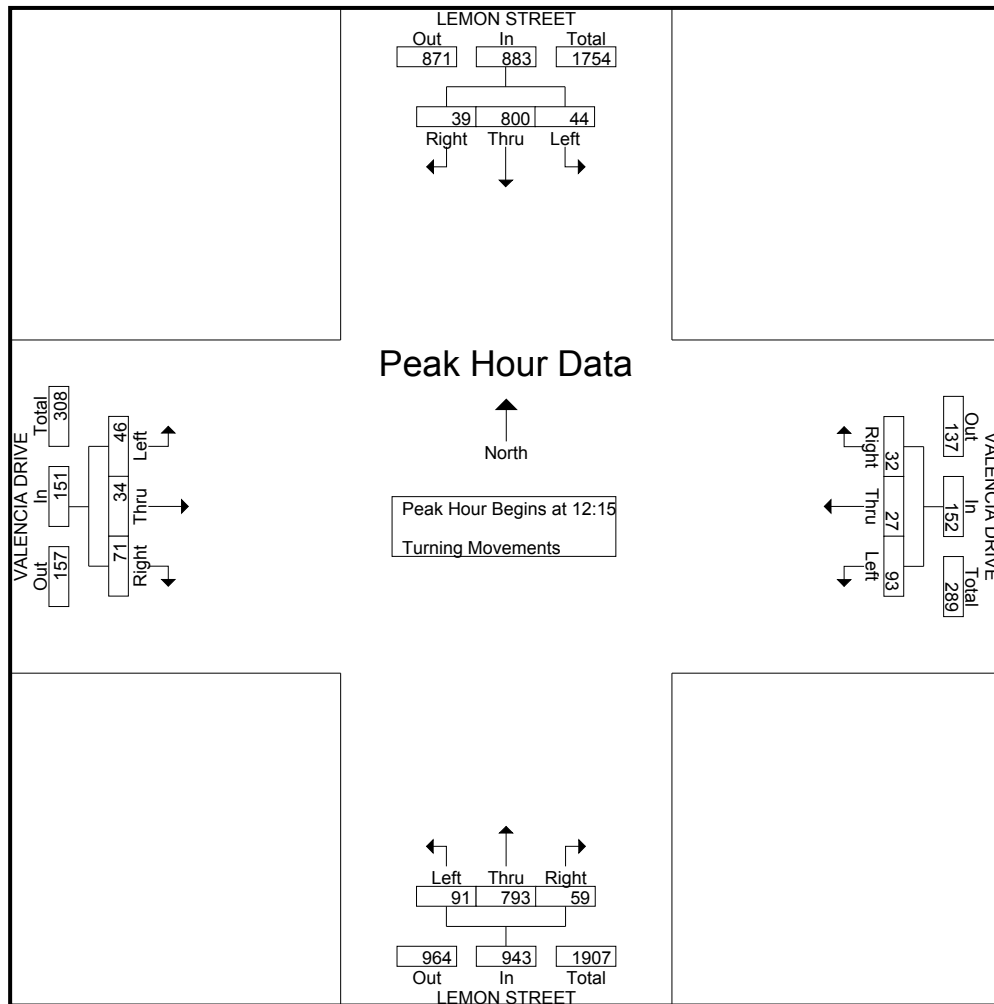
Groups Printed- Turning Movements

	LEMON STREET Southbound			VALENCIA DRIVE Westbound			LEMON STREET Northbound			VALENCIA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	16	194	11	14	11	20	6	179	22	21	11	15	520
12:15	9	229	10	6	7	23	8	213	23	21	6	9	564
12:30	11	181	11	6	3	24	15	203	19	15	8	10	506
12:45	9	188	12	10	5	19	20	180	23	17	8	17	508
Total	45	792	44	36	26	86	49	775	87	74	33	51	2098
13:00	10	202	11	10	12	27	16	197	26	18	12	10	551
13:15	13	169	9	7	10	26	10	162	23	19	5	6	459
13:30	10	196	15	9	5	19	13	184	23	15	6	12	507
13:45	4	201	11	6	8	22	15	180	19	24	2	10	502
Total	37	768	46	32	35	94	54	723	91	76	25	38	2019
*** BREAK ***													
15:30	16	186	10	11	4	20	13	168	31	14	13	8	494
15:45	11	192	16	12	9	26	10	204	20	23	10	12	545
Total	27	378	26	23	13	46	23	372	51	37	23	20	1039
16:00	13	158	11	8	11	21	18	192	28	16	7	7	490
16:15	10	188	19	9	9	23	17	151	15	28	6	7	482
16:30	11	189	8	18	13	16	18	162	23	11	12	9	490
16:45	15	203	14	11	6	22	12	152	17	18	11	6	487
Total	49	738	52	46	39	82	65	657	83	73	36	29	1949
17:00	14	200	14	9	8	25	12	164	27	23	14	4	514
17:15	4	157	18	16	4	16	11	174	16	19	7	7	449
Grand Total	176	3033	200	162	125	349	214	2865	355	302	138	149	8068
Apprch %	5.2	89	5.9	25.5	19.7	54.9	6.2	83.4	10.3	51.3	23.4	25.3	
Total %	2.2	37.6	2.5	2	1.5	4.3	2.7	35.5	4.4	3.7	1.7	1.8	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1711042  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

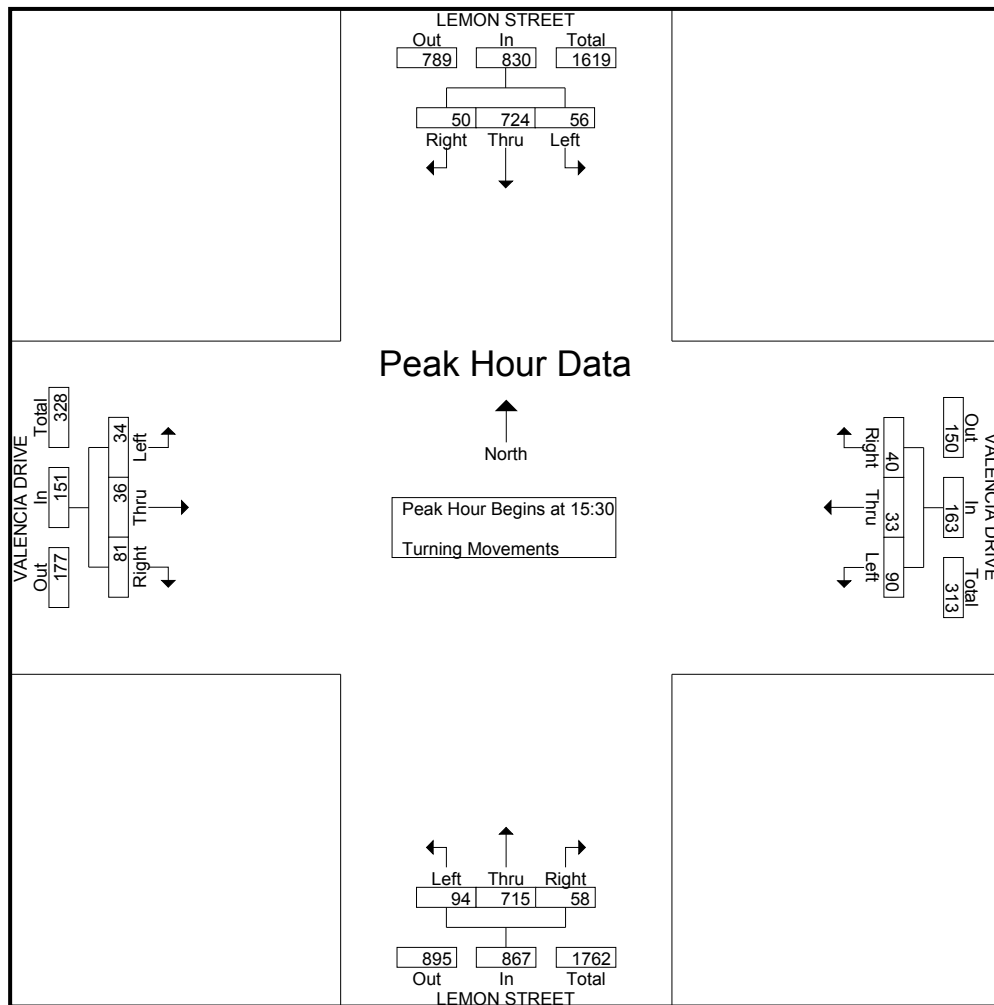
	LEMON STREET Southbound				VALENCIA DRIVE Westbound				LEMON STREET Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	9	229	10	248	6	7	23	36	8	213	23	244	21	6	9	36	564
12:30	11	181	11	203	6	3	24	33	15	203	19	237	15	8	10	33	506
12:45	9	188	12	209	10	5	19	34	20	180	23	223	17	8	17	42	508
13:00	10	202	11	223	10	12	27	49	16	197	26	239	18	12	10	40	551
Total Volume	39	800	44	883	32	27	93	152	59	793	91	943	71	34	46	151	2129
% App. Total	4.4	90.6	5		21.1	17.8	61.2		6.3	84.1	9.7		47	22.5	30.5		
PHF	.886	.873	.917	.890	.800	.563	.861	.776	.738	.931	.875	.966	.845	.708	.676	.899	.944



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1711042  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				VALENCIA DRIVE Westbound				LEMON STREET Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	16	186	10	212	11	4	20	35	13	168	31	212	14	13	8	35	494
15:45	11	192	16	219	12	9	26	47	10	204	20	234	23	10	12	45	545
16:00	13	158	11	182	8	11	21	40	18	192	28	238	16	7	7	30	490
16:15	10	188	19	217	9	9	23	41	17	151	15	183	28	6	7	41	482
Total Volume	50	724	56	830	40	33	90	163	58	715	94	867	81	36	34	151	2011
% App. Total	6	87.2	6.7		24.5	20.2	55.2		6.7	82.5	10.8		53.6	23.8	22.5		
PHF	.781	.943	.737	.947	.833	.750	.865	.867	.806	.876	.758	.911	.723	.692	.708	.839	.922



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711043  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

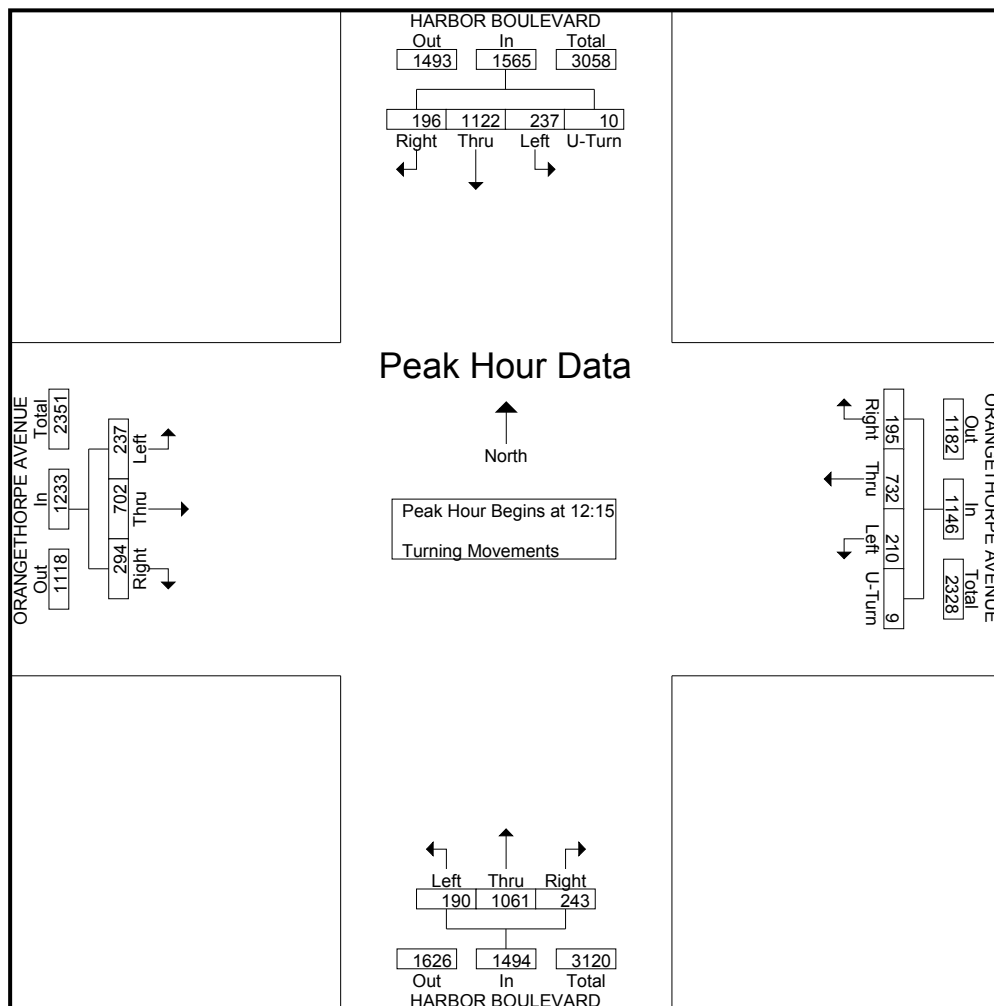
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound				ORANGETHORPE AVENUE Westbound				HARBOR BOULEVARD Northbound			ORANGETHORPE AVENUE Eastbound			Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	
12:00	48	255	56	2	51	178	48	4	57	259	47	55	178	57	1295
12:15	53	284	66	3	49	215	52	3	52	264	49	66	183	58	1397
12:30	47	286	55	3	51	174	54	2	67	261	41	73	153	59	1326
12:45	50	282	65	3	42	153	51	1	57	264	45	73	190	59	1335
Total	198	1107	242	11	193	720	205	10	233	1048	182	267	704	233	5353
13:00	46	270	51	1	53	190	53	3	67	272	55	82	176	61	1380
13:15	53	281	57	1	52	176	49	3	60	253	47	69	172	58	1331
13:30	28	300	59	4	51	204	51	1	63	234	39	59	170	58	1321
13:45	32	278	46	0	49	222	49	3	64	276	58	56	158	49	1340
Total	159	1129	213	6	205	792	202	10	254	1035	199	266	676	226	5372
*** BREAK ***															
15:30	35	282	45	4	46	173	48	2	57	261	59	61	182	52	1307
15:45	56	276	37	2	49	164	51	3	39	262	51	66	152	52	1260
Total	91	558	82	6	95	337	99	5	96	523	110	127	334	104	2567
16:00	30	278	52	2	31	225	42	9	35	268	59	60	169	54	1314
16:15	37	270	48	3	41	181	45	2	57	278	51	55	144	61	1273
16:30	49	282	40	3	43	169	51	2	60	265	53	66	152	58	1293
16:45	29	265	36	4	31	175	49	2	73	282	61	57	145	52	1261
Total	145	1095	176	12	146	750	187	15	225	1093	224	238	610	225	5141
17:00	47	276	53	1	38	178	48	3	52	263	45	62	158	47	1271
17:15	41	265	47	3	36	194	50	3	59	273	58	59	146	60	1294
Grand Total	681	4430	813	39	713	2971	791	46	919	4235	818	1019	2628	895	20998
Apprch %	11.4	74.3	13.6	0.7	15.8	65.7	17.5	1	15.4	70.9	13.7	22.4	57.9	19.7	
Total %	3.2	21.1	3.9	0.2	3.4	14.1	3.8	0.2	4.4	20.2	3.9	4.9	12.5	4.3	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711043  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

	HARBOR BOULEVARD Southbound					ORANGETHORPE AVENUE Westbound					HARBOR BOULEVARD Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 12:15																			
12:15	53	284	66	3	406	49	215	52	3	319	52	264	49	365	66	183	58	307	1397
12:30	47	286	55	3	391	51	174	54	2	281	67	261	41	369	73	153	59	285	1326
12:45	50	282	65	3	400	42	153	51	1	247	57	264	45	366	73	190	59	322	1335
13:00	46	270	51	1	368	53	190	53	3	299	67	272	55	394	82	176	61	319	1380
Total Volume	196	1122	237	10	1565	195	732	210	9	1146	243	1061	190	1494	294	702	237	1233	5438
% App. Total	12.5	71.7	15.1	0.6		17	63.9	18.3	0.8		16.3	71	12.7		23.8	56.9	19.2		
PHF	.925	.981	.898	.833	.964	.920	.851	.972	.750	.898	.907	.975	.864	.948	.896	.924	.971	.957	.973

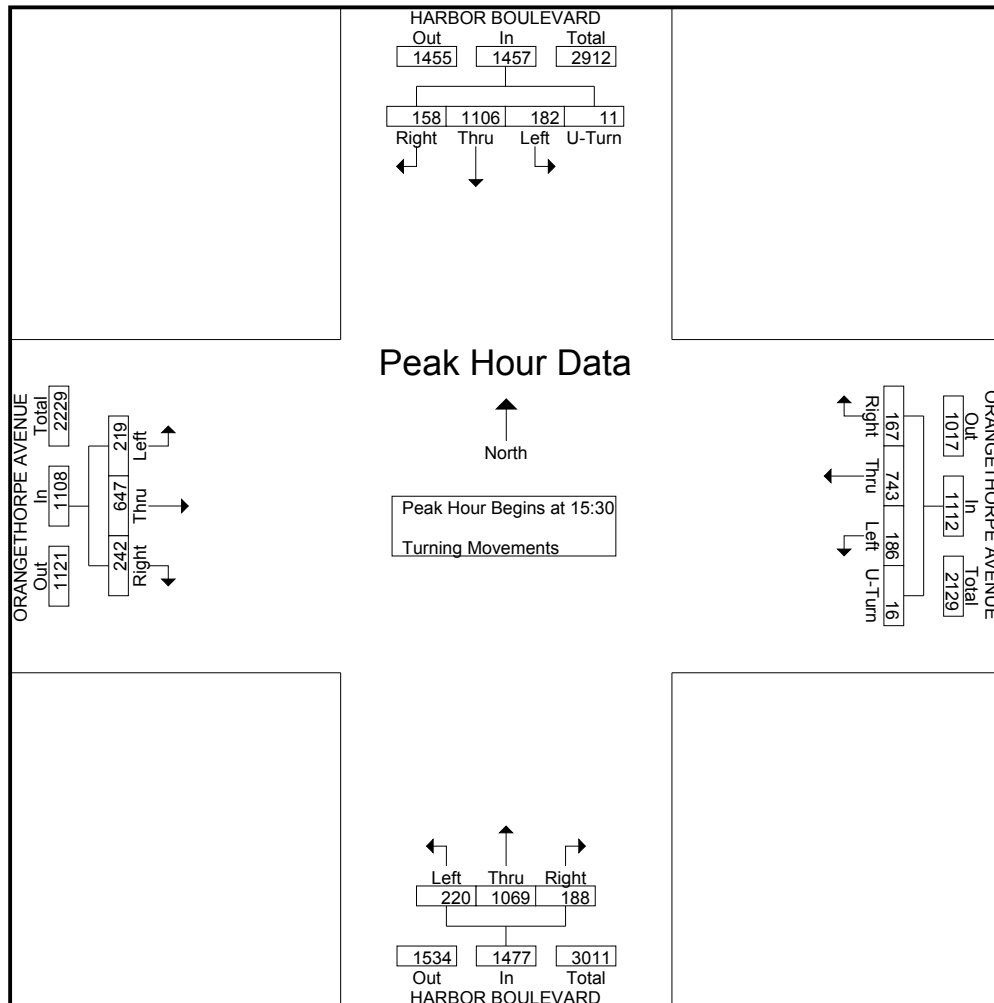




City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711043  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound					ORANGETHORPE AVENUE Westbound					HARBOR BOULEVARD Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 15:30																			
15:30	35	<b>282</b>	45	<b>4</b>	366	46	173	48	2	269	<b>57</b>	261	<b>59</b>	377	61	<b>182</b>	52	<b>295</b>	1307
15:45	<b>56</b>	276	37	2	<b>371</b>	<b>49</b>	164	<b>51</b>	3	267	39	262	51	352	<b>66</b>	152	52	270	1260
16:00	30	278	<b>52</b>	2	362	31	<b>225</b>	42	<b>9</b>	<b>307</b>	35	268	59	362	60	169	54	283	<b>1314</b>
16:15	37	270	48	3	358	41	181	45	2	269	57	<b>278</b>	<b>386</b>	55	144	<b>61</b>	260	1273	
Total Volume	158	1106	182	11	1457	167	743	186	16	1112	188	1069	220	1477	242	647	219	1108	5154
% App. Total	10.8	75.9	12.5	0.8		15	66.8	16.7	1.4		12.7	72.4	14.9		21.8	58.4	19.8		
PHF	.705	.980	.875	.688	.982	.852	.826	.912	.444	.906	.825	.961	.932	.957	.917	.889	.898	.939	.981



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711044  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

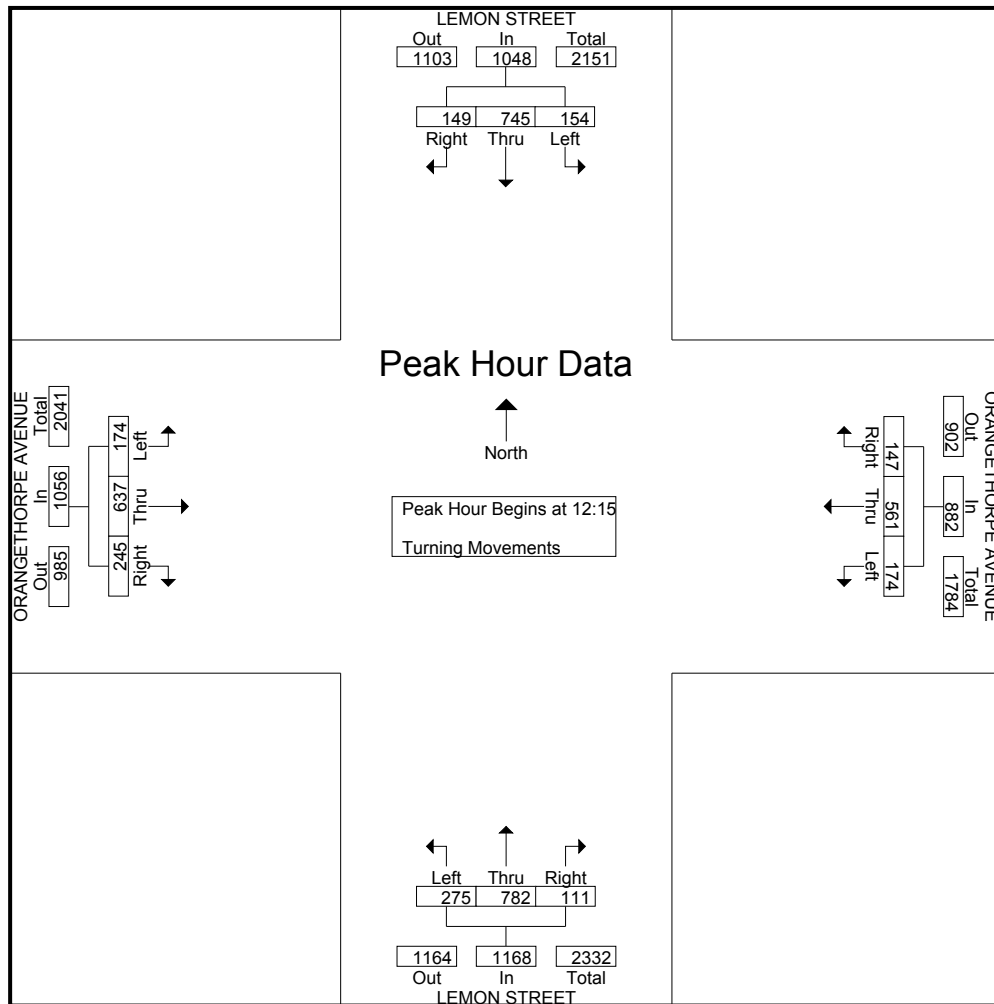
Groups Printed- Turning Movements

	LEMON STREET Southbound			ORANGETHORPE AVENUE Westbound			LEMON STREET Northbound			ORANGETHORPE AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	35	179	41	36	163	36	27	181	65	64	146	48	1021
12:15	44	189	28	30	173	47	34	207	69	71	170	48	1110
12:30	33	202	39	36	149	29	24	183	68	61	142	48	1014
12:45	33	148	40	49	115	54	28	198	79	56	159	43	1002
Total	145	718	148	151	600	166	113	769	281	252	617	187	4147
13:00	39	206	47	32	124	44	25	194	59	57	166	35	1028
13:15	21	179	50	38	133	35	33	169	77	53	181	29	998
13:30	43	182	37	31	146	47	25	203	70	50	159	49	1042
13:45	43	184	42	34	162	35	26	190	67	71	150	41	1045
Total	146	751	176	135	565	161	109	756	273	231	656	154	4113
*** BREAK ***													
15:30	31	176	42	24	120	31	24	203	70	48	161	34	964
15:45	34	196	35	28	116	23	17	203	70	62	124	37	945
Total	65	372	77	52	236	54	41	406	140	110	285	71	1909
16:00	44	181	37	31	114	34	24	198	66	61	133	46	969
16:15	34	187	49	31	116	29	18	134	68	45	128	41	880
16:30	36	168	32	40	100	28	20	155	56	69	142	45	891
16:45	35	163	43	45	123	29	18	128	58	59	148	46	895
Total	149	699	161	147	453	120	80	615	248	234	551	178	3635
17:00	27	196	41	38	120	29	17	153	77	62	130	46	936
17:15	28	183	33	45	114	25	14	140	55	45	153	44	879
Grand Total	560	2919	636	568	2088	555	374	2839	1074	934	2392	680	15619
Apprch %	13.6	70.9	15.5	17.7	65	17.3	8.7	66.2	25.1	23.3	59.7	17	
Total %	3.6	18.7	4.1	3.6	13.4	3.6	2.4	18.2	6.9	6	15.3	4.4	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711044  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

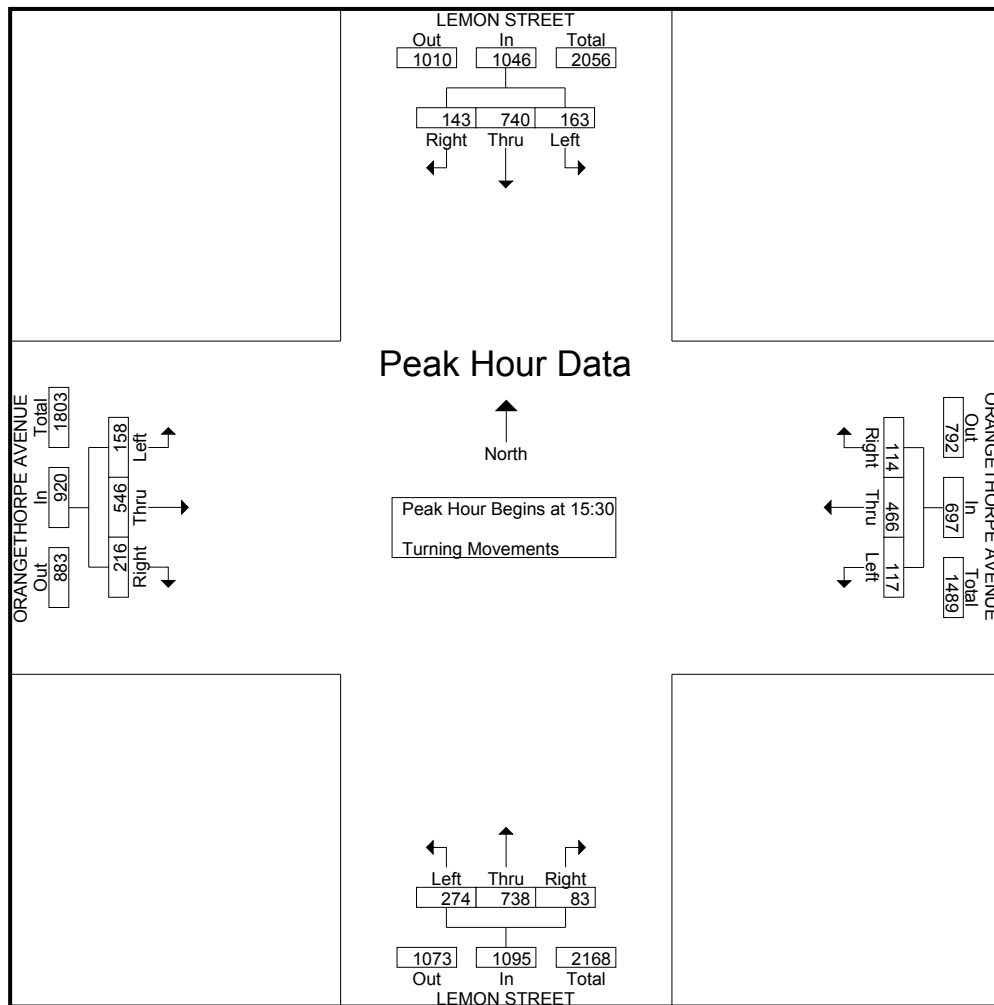
	LEMON STREET Southbound				ORANGETHORPE AVENUE Westbound				LEMON STREET Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	44	189	28	261	30	173	47	250	34	207	69	310	71	170	48	289	1110
12:30	33	202	39	274	36	149	29	214	24	183	68	275	61	142	48	251	1014
12:45	33	148	40	221	49	115	54	218	28	198	79	305	56	159	43	258	1002
13:00	39	206	47	292	32	124	44	200	25	194	59	278	57	166	35	258	1028
Total Volume	149	745	154	1048	147	561	174	882	111	782	275	1168	245	637	174	1056	4154
% App. Total	14.2	71.1	14.7		16.7	63.6	19.7		9.5	67	23.5		23.2	60.3	16.5		
PHF	.847	.904	.819	.897	.750	.811	.806	.882	.816	.944	.870	.942	.863	.937	.906	.913	.936



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1711044  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				ORANGETHORPE AVENUE Westbound				LEMON STREET Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	31	176	42	249	24	120	31	175	24	203	70	297	48	161	34	243	964
15:45	34	196	35	265	28	116	23	167	17	203	70	290	62	124	37	223	945
16:00	44	181	37	262	31	114	34	179	24	198	66	288	61	133	46	240	969
16:15	34	187	49	270	31	116	29	176	18	134	68	220	45	128	41	214	880
Total Volume	143	740	163	1046	114	466	117	697	83	738	274	1095	216	546	158	920	3758
% App. Total	13.7	70.7	15.6		16.4	66.9	16.8		7.6	67.4	25		23.5	59.3	17.2		
PHF	.813	.944	.832	.969	.919	.971	.860	.973	.865	.909	.979	.922	.871	.848	.859	.947	.970



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : h1711045  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

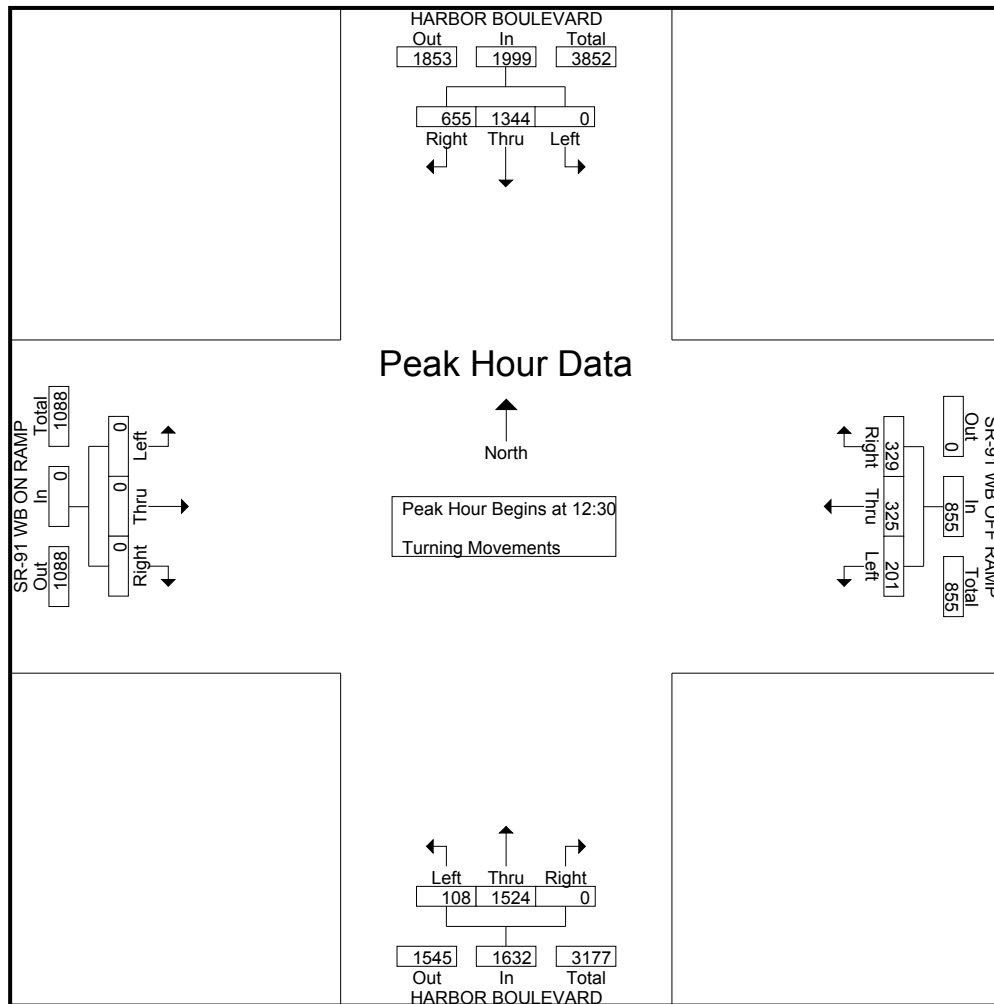
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			SR-91 WB OFF RAMP Westbound			HARBOR BOULEVARD Northbound			SR-91 WB ON RAMP Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	156	281	0	77	68	49	0	331	30	0	0	0	992
12:15	155	298	0	86	97	37	0	368	22	0	0	0	1063
12:30	163	324	0	86	82	55	0	381	25	0	0	0	1116
12:45	159	349	0	73	75	65	0	391	33	0	0	0	1145
Total	633	1252	0	322	322	206	0	1471	110	0	0	0	4316
13:00	169	331	0	88	93	48	0	381	29	0	0	0	1139
13:15	164	340	0	82	75	33	0	371	21	0	0	0	1086
13:30	177	336	0	71	72	55	0	374	27	0	0	0	1112
13:45	163	313	0	88	95	41	0	403	22	0	0	0	1125
Total	673	1320	0	329	335	177	0	1529	99	0	0	0	4462
*** BREAK ***													
15:30	180	310	0	69	97	41	0	375	21	0	0	0	1093
15:45	166	308	0	92	80	38	0	348	23	0	0	0	1055
Total	346	618	0	161	177	79	0	723	44	0	0	0	2148
16:00	154	318	0	90	66	41	0	347	20	0	0	0	1036
16:15	153	337	0	91	83	47	0	379	26	0	0	0	1116
16:30	145	327	0	120	84	54	0	344	26	0	0	0	1100
16:45	159	351	0	111	77	58	0	402	20	0	0	0	1178
Total	611	1333	0	412	310	200	0	1472	92	0	0	0	4430
17:00	144	336	0	95	83	38	0	342	30	0	0	0	1068
17:15	141	323	0	102	73	40	0	387	18	0	0	0	1084
Grand Total	2548	5182	0	1421	1300	740	0	5924	393	0	0	0	17508
Apprch %	33	67	0	41.1	37.6	21.4	0	93.8	6.2	0	0	0	
Total %	14.6	29.6	0	8.1	7.4	4.2	0	33.8	2.2	0	0	0	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : h1711045  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

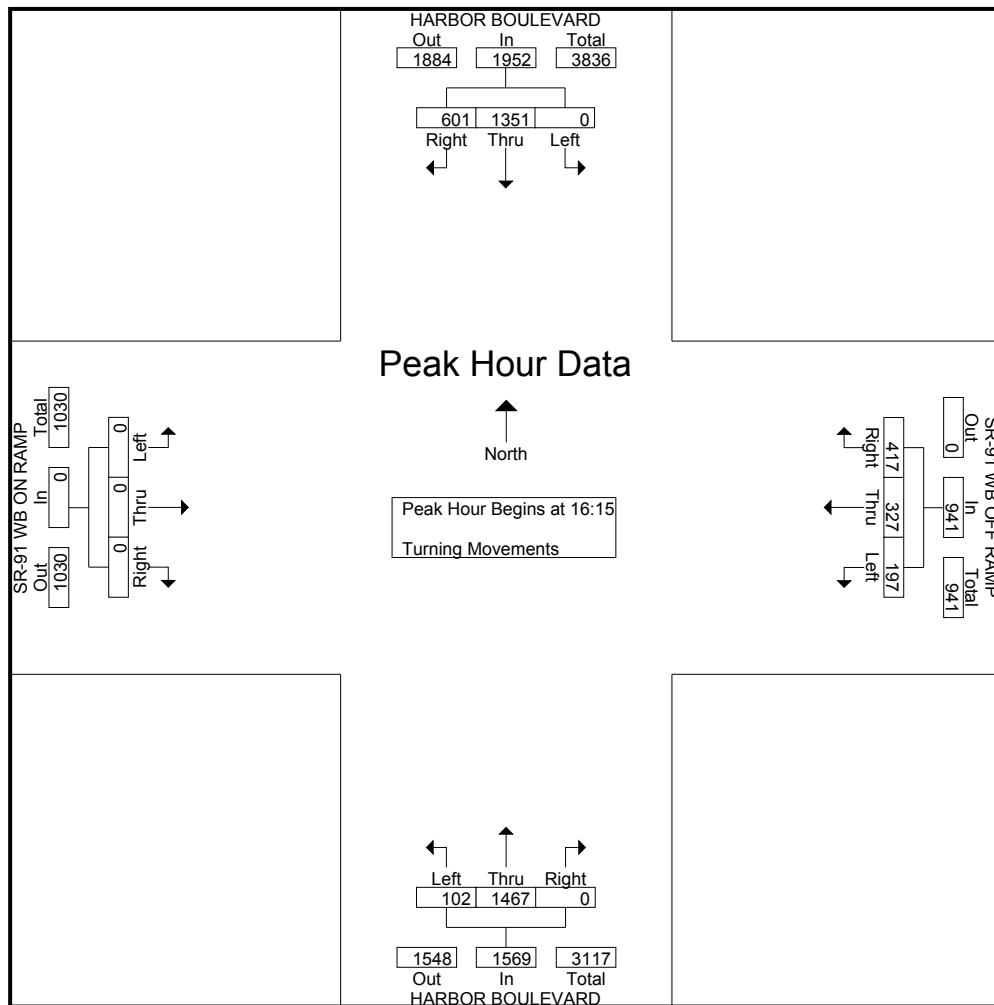
	HARBOR BOULEVARD Southbound				SR-91 WB OFF RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30																	
12:30	163	324	0	487	86	82	55	223	0	381	25	406	0	0	0	0	1116
12:45	159	<b>349</b>	0	<b>508</b>	73	75	<b>65</b>	213	0	<b>391</b>	<b>33</b>	<b>424</b>	0	0	0	0	<b>1145</b>
13:00	<b>169</b>	331	0	500	<b>88</b>	<b>93</b>	48	<b>229</b>	0	381	29	410	0	0	0	0	1139
13:15	164	340	0	504	82	75	33	190	0	371	21	392	0	0	0	0	1086
Total Volume	655	1344	0	1999	329	325	201	855	0	1524	108	1632	0	0	0	0	4486
% App. Total	32.8	67.2	0		38.5	38	23.5		0	93.4	6.6		0	0	0		
PHF	.969	.963	.000	.984	.935	.874	.773	.933	.000	.974	.818	.962	.000	.000	.000	.000	.979



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : h1711045  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				SR-91 WB OFF RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	153	337	0	490	91	83	47	221	0	379	26	405	0	0	0	0	1116
16:30	145	327	0	472	<b>120</b>	<b>84</b>	54	<b>258</b>	0	344	26	370	0	0	0	0	1100
16:45	<b>159</b>	<b>351</b>	0	<b>510</b>	111	77	<b>58</b>	246	0	<b>402</b>	20	<b>422</b>	0	0	0	0	<b>1178</b>
17:00	144	336	0	480	95	83	38	216	0	342	<b>30</b>	372	0	0	0	0	1068
Total Volume	601	1351	0	1952	417	327	197	941	0	1467	102	1569	0	0	0	0	4462
% App. Total	30.8	69.2	0		44.3	34.8	20.9		0	93.5	6.5		0	0	0		
PHF	.945	.962	.000	.957	.869	.973	.849	.912	.000	.912	.850	.930	.000	.000	.000	.000	.947



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1711046  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

Groups Printed- Turning Movements

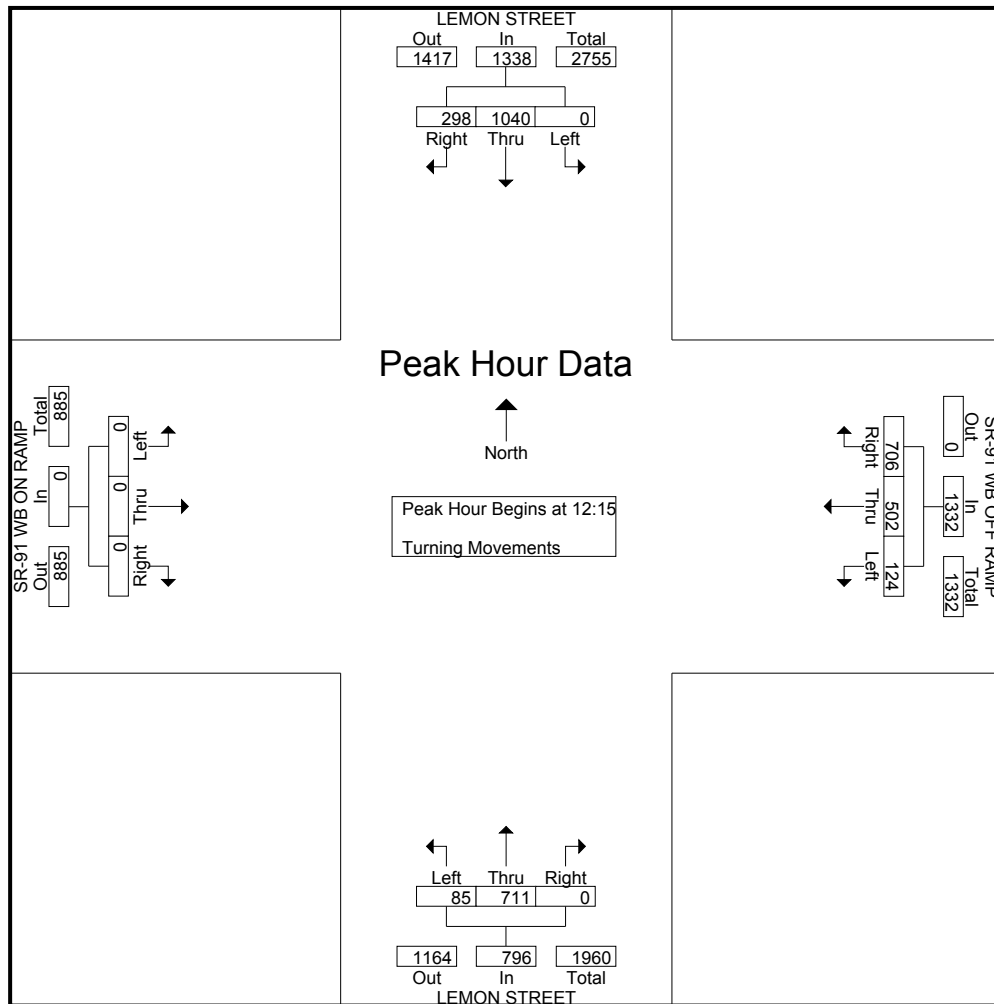
	LEMON STREET Southbound			SR-91 WB OFF RAMP Westbound			LEMON STREET Northbound			SR-91 WB ON RAMP Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	51	254	0	165	121	47	0	185	16	0	0	0	839
12:15	82	260	0	151	117	29	0	211	25	0	0	0	875
12:30	75	268	0	179	135	30	0	155	17	0	0	0	859
12:45	56	237	0	192	127	34	0	175	21	0	0	0	842
Total	264	1019	0	687	500	140	0	726	79	0	0	0	3415
13:00	85	275	0	184	123	31	0	170	22	0	0	0	890
13:15	62	269	0	186	103	41	0	156	18	0	0	0	835
13:30	68	278	0	162	128	43	0	159	12	0	0	0	850
13:45	84	264	0	160	117	41	0	168	19	0	0	0	853
Total	299	1086	0	692	471	156	0	653	71	0	0	0	3428
*** BREAK ***													
15:30	84	240	0	182	108	40	0	157	22	0	0	0	833
15:45	55	273	0	174	122	45	0	171	22	0	0	0	862
Total	139	513	0	356	230	85	0	328	44	0	0	0	1695
16:00	66	265	0	161	122	36	0	147	15	0	0	0	812
16:15	69	230	0	121	144	38	0	152	17	0	0	0	771
16:30	66	246	0	111	168	44	0	153	22	0	0	0	810
16:45	71	237	0	116	142	45	0	180	21	0	0	0	812
Total	272	978	0	509	576	163	0	632	75	0	0	0	3205
17:00	75	256	0	128	116	36	0	158	21	0	0	0	790
17:15	54	264	0	93	155	38	0	142	18	0	0	0	764
Grand Total	1103	4116	0	2465	2048	618	0	2639	308	0	0	0	13297
Apprch %	21.1	78.9	0	48	39.9	12	0	89.5	10.5	0	0	0	
Total %	8.3	31	0	18.5	15.4	4.6	0	19.8	2.3	0	0	0	



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1711046  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

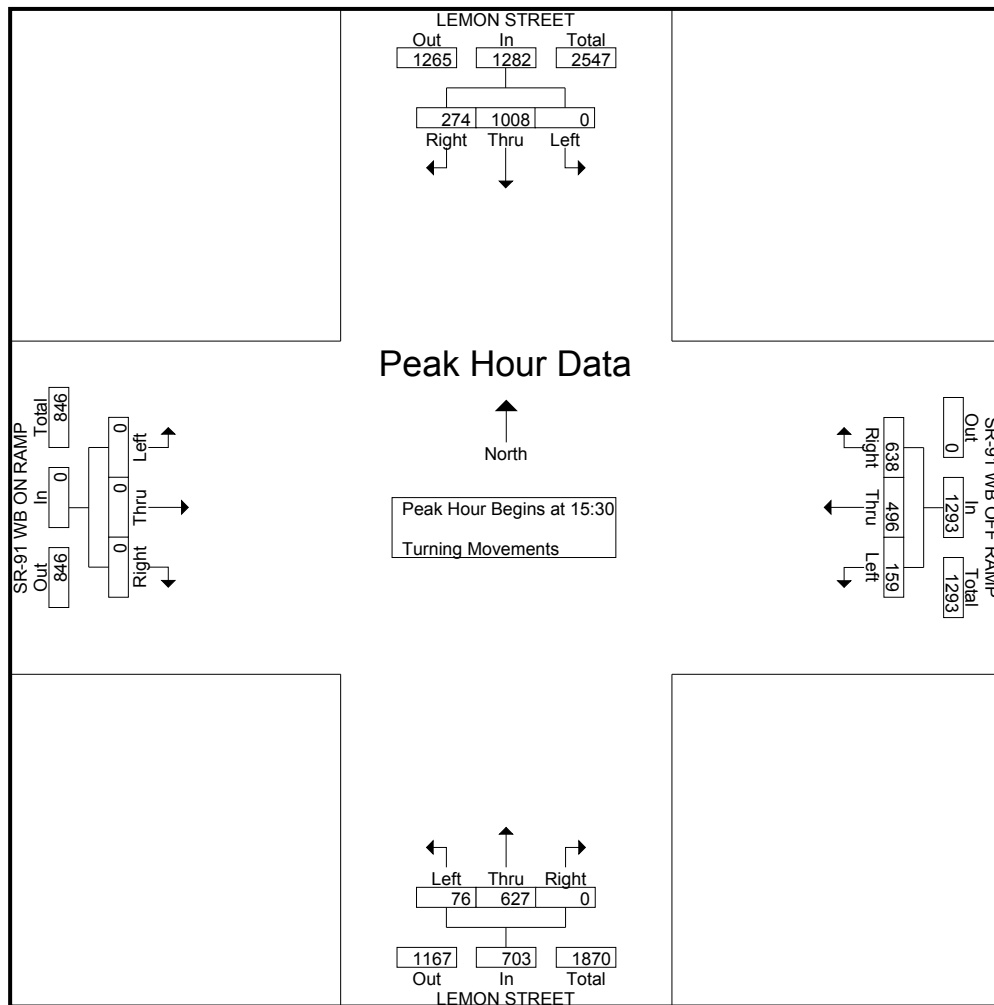
	LEMON STREET Southbound				SR-91 WB OFF RAMP Westbound				LEMON STREET Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	82	260	0	342	151	117	29	297	0	211	25	236	0	0	0	0	875
12:30	75	268	0	343	179	135	30	344	0	155	17	172	0	0	0	0	859
12:45	56	237	0	293	192	127	34	353	0	175	21	196	0	0	0	0	842
13:00	85	275	0	360	184	123	31	338	0	170	22	192	0	0	0	0	890
Total Volume	298	1040	0	1338	706	502	124	1332	0	711	85	796	0	0	0	0	3466
% App. Total	22.3	77.7	0		53	37.7	9.3		0	89.3	10.7		0	0	0		
PHF	.876	.945	.000	.929	.919	.930	.912	.943	.000	.842	.850	.843	.000	.000	.000	.000	.974



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1711046  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				SR-91 WB OFF RAMP Westbound				LEMON STREET Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	84	240	0	324	182	108	40	330	0	157	22	179	0	0	0	0	833
15:45	55	273	0	328	174	122	45	341	0	171	22	193	0	0	0	0	862
16:00	66	265	0	331	161	122	36	319	0	147	15	162	0	0	0	0	812
16:15	69	230	0	299	121	144	38	303	0	152	17	169	0	0	0	0	771
Total Volume	274	1008	0	1282	638	496	159	1293	0	627	76	703	0	0	0	0	3278
% App. Total	21.4	78.6	0		49.3	38.4	12.3		0	89.2	10.8		0	0	0		
PHF	.815	.923	.000	.968	.876	.861	.883	.948	.000	.917	.864	.911	.000	.000	.000	.000	.951



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1711047  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

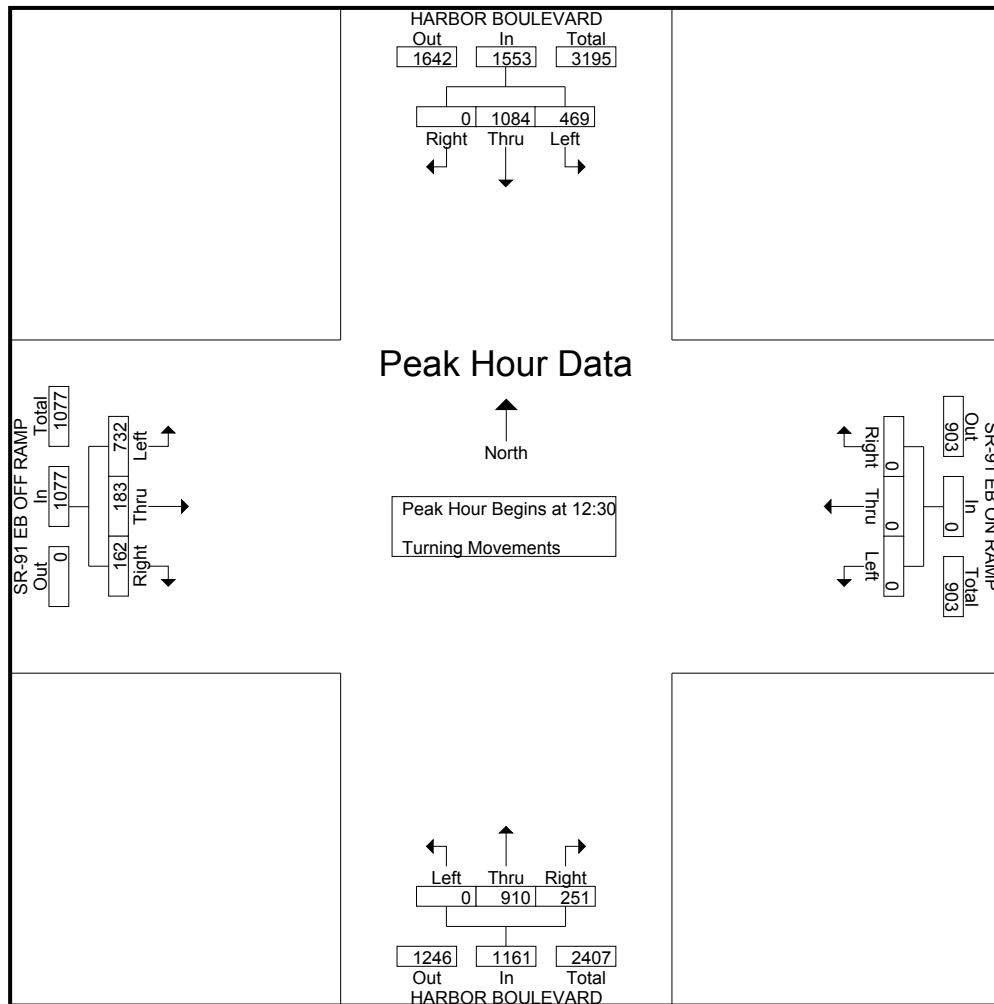
Groups Printed- Turning Movements

Start Time	HARBOR BOULEVARD Southbound			SR-91 EB ON RAMP Westbound			HARBOR BOULEVARD Northbound			SR-91 EB OFF RAMP Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	219	103	0	0	0	62	214	0	44	60	151	853
12:15	0	228	110	0	0	0	63	209	0	35	58	184	887
12:30	0	279	118	0	0	0	61	234	0	43	44	192	971
12:45	0	284	119	0	0	0	66	195	0	44	52	202	962
Total	0	1010	450	0	0	0	252	852	0	166	214	729	3673
13:00	0	265	106	0	0	0	70	244	0	39	40	175	939
13:15	0	256	126	0	0	0	54	237	0	36	47	163	919
13:30	0	254	120	0	0	0	56	211	0	40	54	191	926
13:45	0	261	110	0	0	0	64	252	0	27	40	159	913
Total	0	1036	462	0	0	0	244	944	0	142	181	688	3697
*** BREAK ***													
15:30	0	249	92	0	0	0	65	239	0	47	48	179	919
15:45	0	257	96	0	0	0	64	219	0	42	53	160	891
Total	0	506	188	0	0	0	129	458	0	89	101	339	1810
16:00	0	246	115	0	0	0	64	197	0	35	44	159	860
16:15	0	251	126	0	0	0	70	215	0	25	55	181	923
16:30	0	266	109	0	0	0	59	248	0	29	48	144	903
16:45	0	293	108	0	0	0	59	254	0	35	49	151	949
Total	0	1056	458	0	0	0	252	914	0	124	196	635	3635
17:00	0	254	110	0	0	0	57	226	0	45	58	145	895
17:15	0	257	99	0	0	0	71	241	0	32	46	176	922
Grand Total	0	4119	1767	0	0	0	1005	3635	0	598	796	2712	14632
Apprch %	0	70	30	0	0	0	21.7	78.3	0	14.6	19.4	66	
Total %	0	28.2	12.1	0	0	0	6.9	24.8	0	4.1	5.4	18.5	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1711047  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

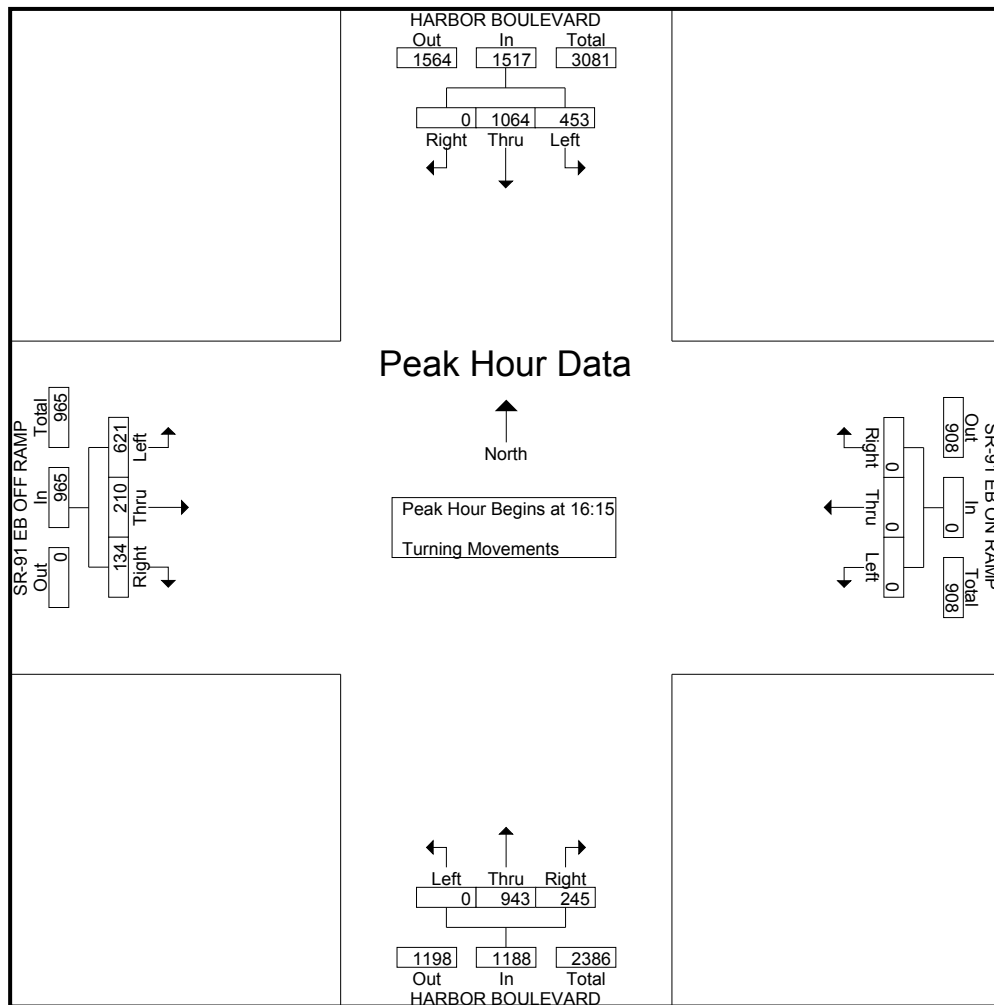
	HARBOR BOULEVARD Southbound				SR-91 EB ON RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30																	
12:30	0	279	118	397	0	0	0	0	61	234	0	295	43	44	192	279	<b>971</b>
12:45	0	<b>284</b>	119	<b>403</b>	0	0	0	0	66	195	0	261	<b>44</b>	<b>52</b>	<b>202</b>	<b>298</b>	962
13:00	0	265	106	371	0	0	0	0	<b>70</b>	<b>244</b>	0	<b>314</b>	39	40	175	254	939
13:15	0	256	<b>126</b>	382	0	0	0	0	54	237	0	291	36	47	163	246	919
Total Volume	0	1084	469	1553	0	0	0	0	251	910	0	1161	162	183	732	1077	3791
% App. Total	0	69.8	30.2		0	0	0		21.6	78.4	0		15	17	68		
PHF	.000	.954	.931	.963	.000	.000	.000	.000	.896	.932	.000	.924	.920	.880	.906	.904	.976



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1711047  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	HARBOR BOULEVARD Southbound				SR-91 EB ON RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	0	251	126	377	0	0	0	0	70	215	0	285	25	55	181	261	923
16:30	0	266	109	375	0	0	0	0	59	248	0	307	29	48	144	221	903
16:45	0	293	108	401	0	0	0	0	59	254	0	313	35	49	151	235	949
17:00	0	254	110	364	0	0	0	0	57	226	0	283	45	58	145	248	895
Total Volume	0	1064	453	1517	0	0	0	0	245	943	0	1188	134	210	621	965	3670
% App. Total	0	70.1	29.9		0	0	0		20.6	79.4	0		13.9	21.8	64.4		
PHF	.000	.908	.899	.946	.000	.000	.000	.000	.875	.928	.000	.949	.744	.905	.858	.924	.967



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1711048  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

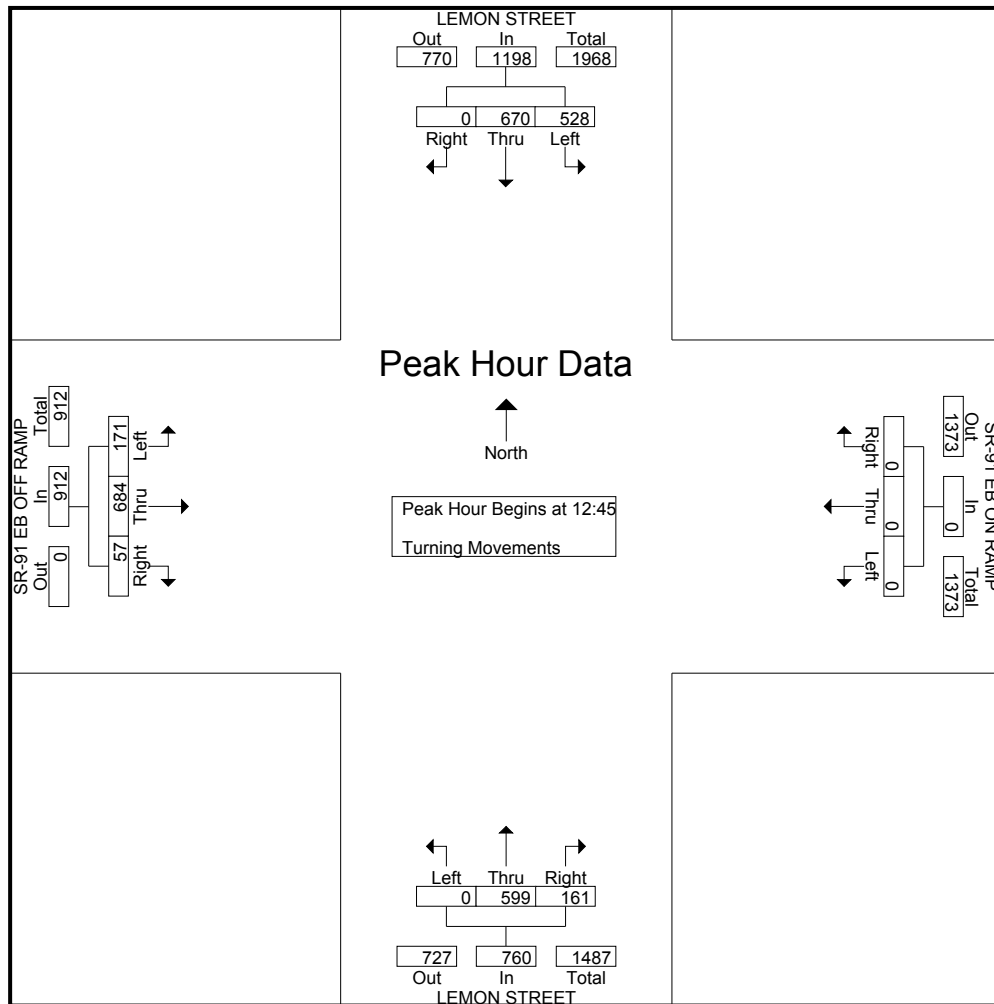
Groups Printed- Turning Movements

Start Time	LEMON STREET Southbound			SR-91 EB ON RAMP Westbound			LEMON STREET Northbound			SR-91 EB OFF RAMP Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	175	137	0	0	0	56	164	0	10	156	53	751
12:15	0	158	139	0	0	0	38	165	0	14	156	45	715
12:30	0	171	127	0	0	0	49	140	0	15	170	40	712
12:45	0	138	106	0	0	0	32	153	0	17	182	49	677
Total	0	642	509	0	0	0	175	622	0	56	664	187	2855
13:00	0	182	145	0	0	0	34	152	0	8	161	37	719
13:15	0	176	118	0	0	0	52	147	0	11	164	44	712
13:30	0	174	159	0	0	0	43	147	0	21	177	41	762
13:45	0	160	144	0	0	0	36	117	0	11	166	42	676
Total	0	692	566	0	0	0	165	563	0	51	668	164	2869
*** BREAK ***													
15:30	0	158	127	0	0	0	53	133	0	13	157	37	678
15:45	0	175	141	0	0	0	37	143	0	8	154	52	710
Total	0	333	268	0	0	0	90	276	0	21	311	89	1388
16:00	0	166	122	0	0	0	36	129	0	16	156	38	663
16:15	0	153	127	0	0	0	40	131	0	14	185	48	698
16:30	0	167	126	0	0	0	39	129	0	13	160	39	673
16:45	0	162	124	0	0	0	35	137	0	4	152	52	666
Total	0	648	499	0	0	0	150	526	0	47	653	177	2700
17:00	0	160	127	0	0	0	41	143	0	13	163	57	704
17:15	0	171	132	0	0	0	38	123	0	10	157	36	667
Grand Total	0	2646	2101	0	0	0	659	2253	0	198	2616	710	11183
Apprch %	0	55.7	44.3	0	0	0	22.6	77.4	0	5.6	74.2	20.1	
Total %	0	23.7	18.8	0	0	0	5.9	20.1	0	1.8	23.4	6.3	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1711048  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

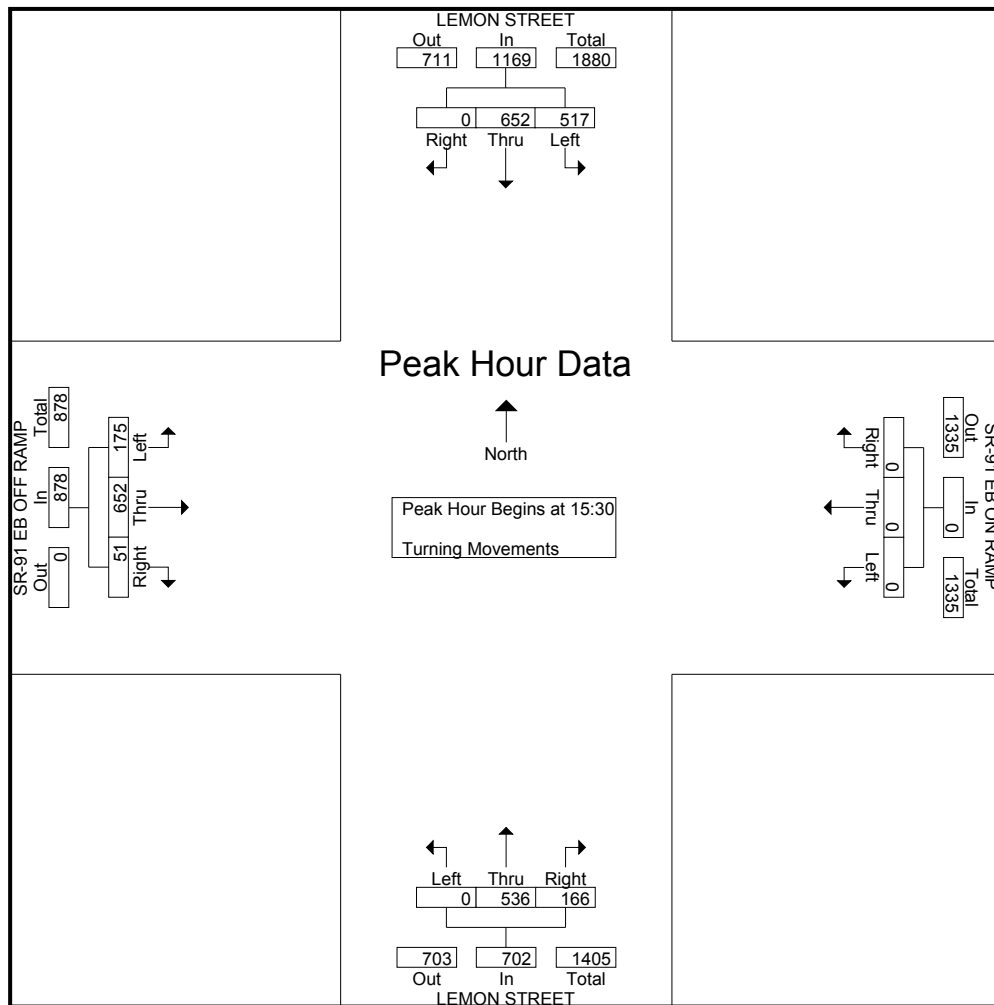
	LEMON STREET Southbound				SR-91 EB ON RAMP Westbound				LEMON STREET Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45																	
12:45	0	138	106	244	0	0	0	0	32	153	0	185	17	182	49	248	677
13:00	0	182	145	327	0	0	0	0	34	152	0	186	8	161	37	206	719
13:15	0	176	118	294	0	0	0	0	52	147	0	199	11	164	44	219	712
13:30	0	174	159	333	0	0	0	0	43	147	0	190	21	177	41	239	762
Total Volume	0	670	528	1198	0	0	0	0	161	599	0	760	57	684	171	912	2870
% App. Total	0	55.9	44.1		0	0	0		21.2	78.8	0		6.2	75	18.8		
PHF	.000	.920	.830	.899	.000	.000	.000	.000	.774	.979	.000	.955	.679	.940	.872	.919	.942



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1711048  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				SR-91 EB ON RAMP Westbound				LEMON STREET Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:30																	
15:30	0	158	127	285	0	0	0	0	53	133	0	186	13	157	37	207	678
15:45	0	175	141	316	0	0	0	0	37	143	0	180	8	154	52	214	710
16:00	0	166	122	288	0	0	0	0	36	129	0	165	16	156	38	210	663
16:15	0	153	127	280	0	0	0	0	40	131	0	171	14	185	48	247	698
Total Volume	0	652	517	1169	0	0	0	0	166	536	0	702	51	652	175	878	2749
% App. Total	0	55.8	44.2		0	0	0		23.6	76.4	0		5.8	74.3	19.9		
PHF	.000	.931	.917	.925	.000	.000	.000	.000	.783	.937	.000	.944	.797	.881	.841	.889	.968





City: FULLERTON  
N-S Direction: CENTENNIAL WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711049  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

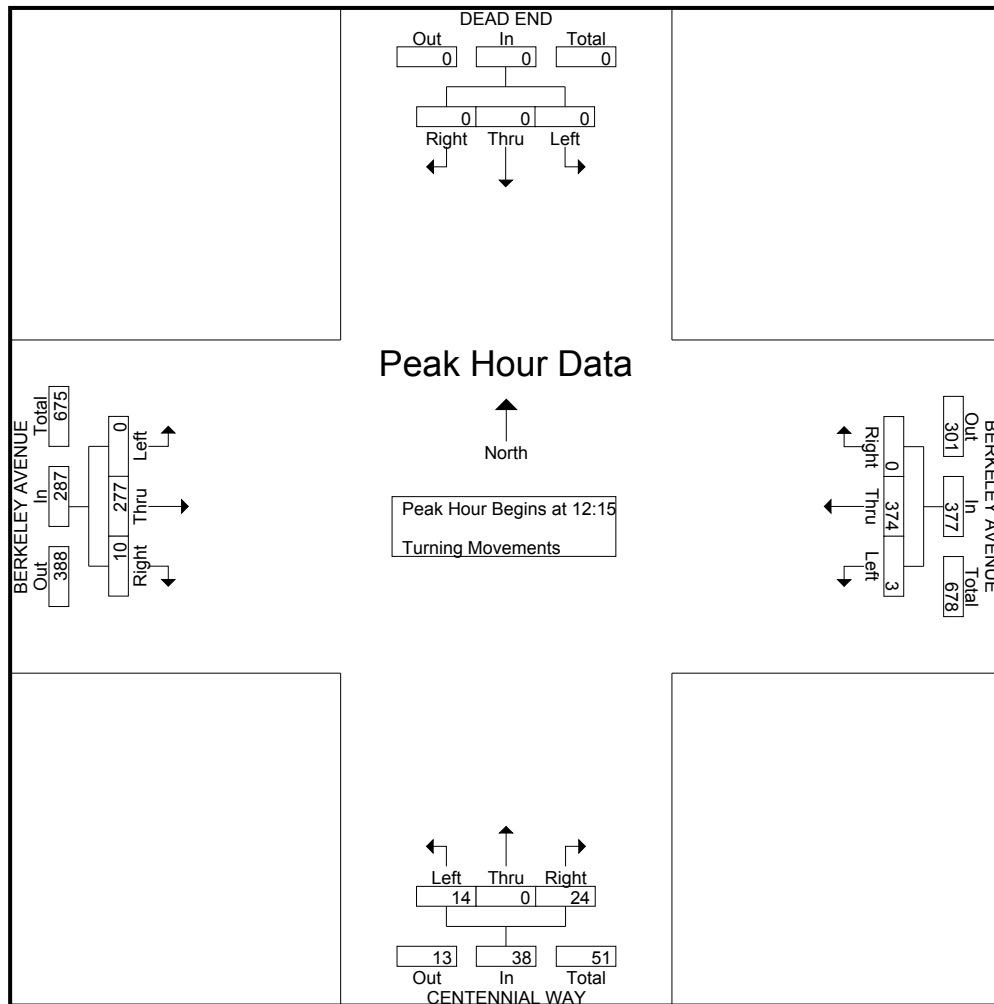
Groups Printed- Turning Movements

Start Time	DEAD END Southbound			BERKELEY AVENUE Westbound			CENTENNIAL WAY Northbound			BERKELEY AVENUE Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	0	0	0	79	1	10	0	4	2	54	0	150
12:15	0	0	0	0	102	1	7	0	3	3	65	0	181
12:30	0	0	0	0	77	0	2	0	0	0	73	0	152
12:45	0	0	0	0	123	1	6	0	4	2	79	0	215
Total	0	0	0	0	381	3	25	0	11	7	271	0	698
13:00	0	0	0	0	72	1	9	0	7	5	60	0	154
13:15	0	0	0	0	70	0	2	0	1	5	63	0	141
13:30	0	0	0	0	78	0	3	0	3	5	40	0	129
13:45	0	0	0	0	71	1	4	0	4	1	70	0	151
Total	0	0	0	0	291	2	18	0	15	16	233	0	575
*** BREAK ***													
15:30	0	0	0	0	65	0	2	0	2	0	50	0	119
15:45	0	0	0	0	57	2	0	0	0	0	58	0	117
Total	0	0	0	0	122	2	2	0	2	0	108	0	236
16:00	0	0	0	0	69	0	5	0	5	4	63	0	146
16:15	0	0	0	0	68	1	4	0	6	1	50	0	130
16:30	0	0	0	0	60	2	1	0	1	1	60	0	125
16:45	0	0	0	0	64	2	3	0	2	7	43	0	121
Total	0	0	0	0	261	5	13	0	14	13	216	0	522
17:00	0	0	0	0	57	1	14	0	8	4	50	0	134
17:15	0	0	0	0	62	0	5	0	1	2	64	0	134
Grand Total	0	0	0	0	1174	13	77	0	51	42	942	0	2299
Apprch %	0	0	0	0	98.9	1.1	60.2	0	39.8	4.3	95.7	0	
Total %	0	0	0	0	51.1	0.6	3.3	0	2.2	1.8	41	0	

City: FULLERTON  
N-S Direction: CENTENNIAL WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711049  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

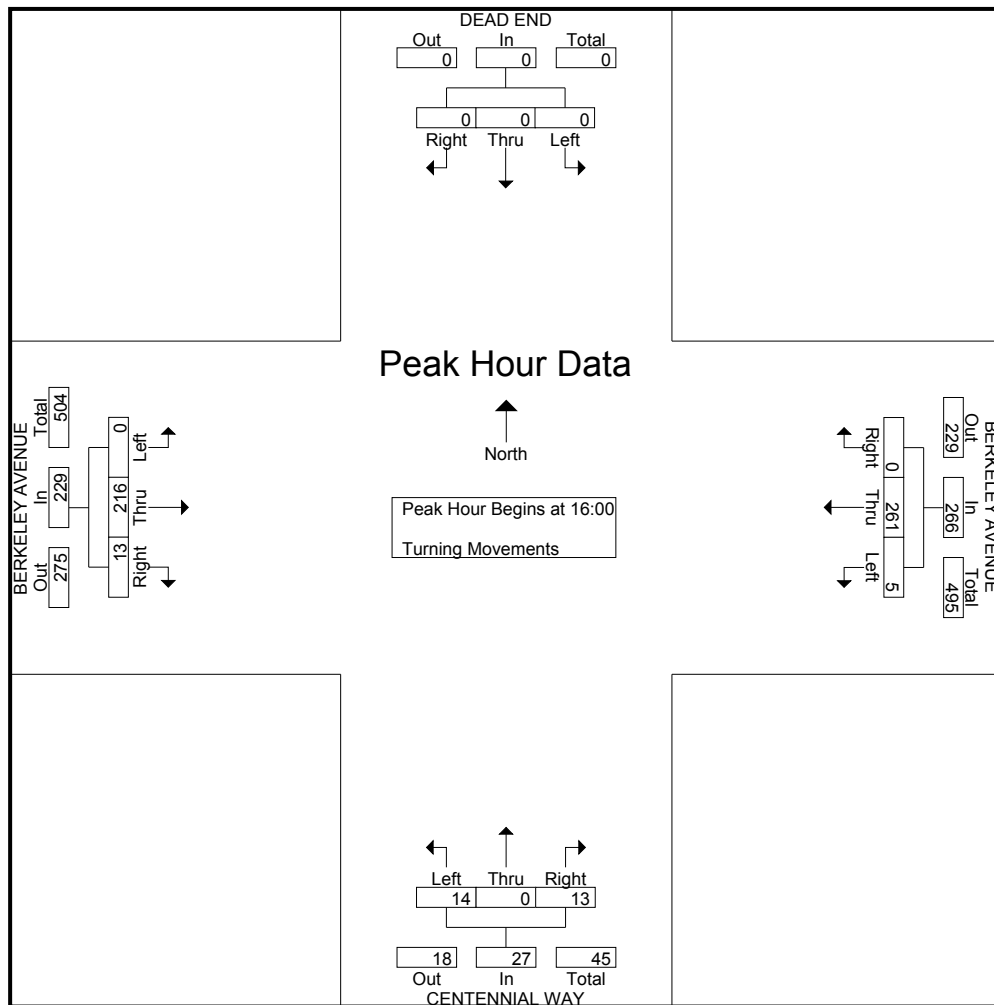
	DEAD END Southbound				BERKELEY AVENUE Westbound				CENTENNIAL WAY Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	0	0	0	0	0	102	1	103	7	0	3	10	3	65	0	68	181
12:30	0	0	0	0	0	77	0	77	2	0	0	2	0	73	0	73	152
12:45	0	0	0	0	0	123	1	124	6	0	4	10	2	79	0	81	215
13:00	0	0	0	0	0	72	1	73	9	0	7	16	5	60	0	65	154
Total Volume	0	0	0	0	0	374	3	377	24	0	14	38	10	277	0	287	702
% App. Total	0	0	0	0	0	99.2	0.8		63.2	0	36.8		3.5	96.5	0		
PHF	.000	.000	.000	.000	.000	.760	.750	.760	.667	.000	.500	.594	.500	.877	.000	.886	.816



City: FULLERTON  
N-S Direction: CENTENNIAL WAY  
E-W Direction: BERKELEY AVENUE

File Name : H1711049  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	DEAD END Southbound				BERKELEY AVENUE Westbound				CENTENNIAL WAY Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	69	0	69	5	0	5	10	4	63	0	67	146
16:15	0	0	0	0	0	68	1	69	4	0	6	10	1	50	0	51	130
16:30	0	0	0	0	0	60	2	62	1	0	1	2	1	60	0	61	125
16:45	0	0	0	0	0	64	2	66	3	0	2	5	7	43	0	50	121
Total Volume	0	0	0	0	0	261	5	266	13	0	14	27	13	216	0	229	522
% App. Total	0	0	0	0	0	98.1	1.9		48.1	0	51.9		5.7	94.3	0		
PHF	.000	.000	.000	.000	.000	.946	.625	.964	.650	.000	.583	.675	.464	.857	.000	.854	.894



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: FULLERTON COLLEGE DRIVE

File Name : H1711050  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

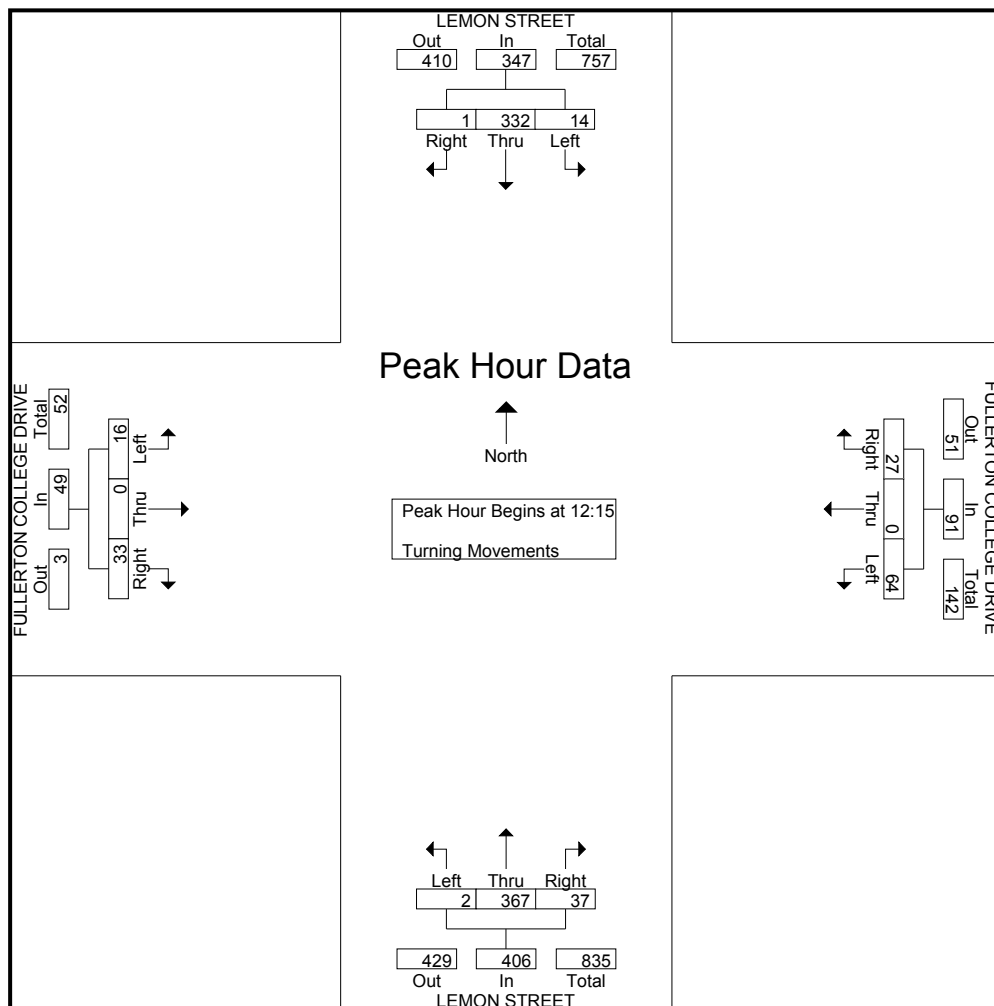
Groups Printed- Turning Movements

	LEMON STREET Southbound			FULLERTON COLLEGE DRIVE Westbound			LEMON STREET Northbound			FULLERTON COLLEGE DRIVE Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	70	2	7	0	24	10	83	0	3	0	6	205
12:15	0	99	6	10	0	28	16	107	0	19	0	4	289
12:30	0	77	4	5	0	11	8	93	0	7	0	3	208
12:45	0	71	2	6	0	8	5	71	0	3	0	4	170
Total	0	317	14	28	0	71	39	354	0	32	0	17	872
13:00	1	85	2	6	0	17	8	96	2	4	0	5	226
13:15	0	60	2	4	0	13	11	97	0	2	0	2	191
13:30	1	65	0	2	0	18	8	81	0	1	0	0	176
13:45	0	76	0	1	0	10	5	92	0	0	0	0	184
Total	2	286	4	13	0	58	32	366	2	7	0	7	777
*** BREAK ***													
15:30	0	88	0	2	0	11	6	74	0	0	0	1	182
15:45	0	59	3	1	0	11	2	87	0	0	0	1	164
Total	0	147	3	3	0	22	8	161	0	0	0	2	346
16:00	0	76	0	2	0	9	4	89	0	0	0	1	181
16:15	0	75	0	2	0	4	6	77	0	3	0	0	167
16:30	0	76	1	0	0	4	5	80	0	0	0	0	166
16:45	0	78	4	4	0	6	11	91	0	0	1	0	195
Total	0	305	5	8	0	23	26	337	0	3	1	1	709
17:00	0	86	0	0	0	6	9	76	0	1	0	1	179
17:15	0	73	5	4	0	7	7	72	0	0	1	0	169
Grand Total	2	1214	31	56	0	187	121	1366	2	43	2	28	3052
Apprch %	0.2	97.4	2.5	23	0	77	8.1	91.7	0.1	58.9	2.7	38.4	
Total %	0.1	39.8	1	1.8	0	6.1	4	44.8	0.1	1.4	0.1	0.9	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: FULLERTON COLLEGE DRIVE

File Name : H1711050  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

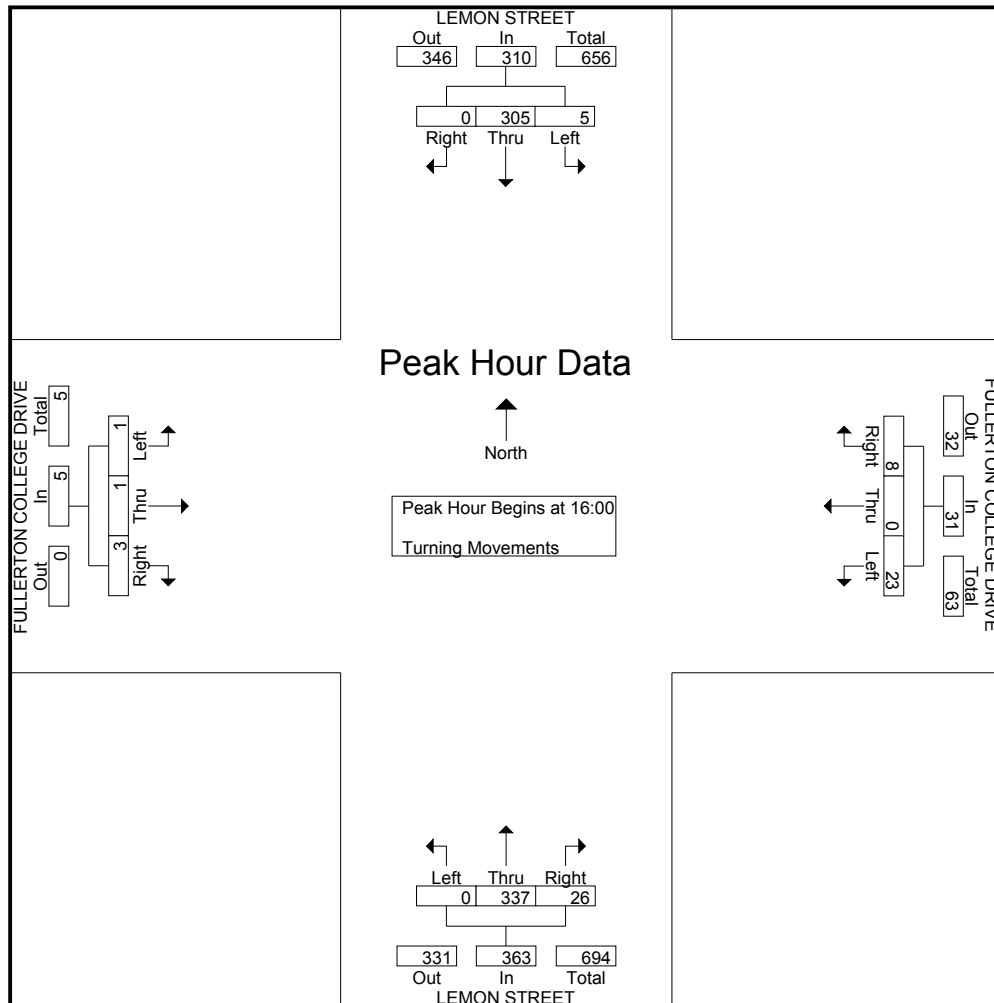
	LEMON STREET Southbound				FULLERTON COLLEGE DRIVE Westbound				LEMON STREET Northbound				FULLERTON COLLEGE DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	0	99	6	105	10	0	28	38	16	107	0	123	19	0	4	23	289
12:30	0	77	4	81	5	0	11	16	8	93	0	101	7	0	3	10	208
12:45	0	71	2	73	6	0	8	14	5	71	0	76	3	0	4	7	170
13:00	1	85	2	88	6	0	17	23	8	96	2	106	4	0	5	9	226
Total Volume	1	332	14	347	27	0	64	91	37	367	2	406	33	0	16	49	893
% App. Total	0.3	95.7	4		29.7	0	70.3		9.1	90.4	0.5		67.3	0	32.7		
PHF	.250	.838	.583	.826	.675	.000	.571	.599	.578	.857	.250	.825	.434	.000	.800	.533	.772



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: FULLERTON COLLEGE DRIVE

File Name : H1711050  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	LEMON STREET Southbound				FULLERTON COLLEGE DRIVE Westbound				LEMON STREET Northbound				FULLERTON COLLEGE DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	76	0	76	2	0	9	11	4	89	0	93	0	0	1	1	181
16:15	0	75	0	75	2	0	4	6	6	77	0	83	3	0	0	3	167
16:30	0	76	1	77	0	0	4	4	5	80	0	85	0	0	0	0	166
16:45	0	78	4	82	4	0	6	10	11	91	0	102	0	1	0	1	195
Total Volume	0	305	5	310	8	0	23	31	26	337	0	363	3	1	1	5	709
% App. Total	0	98.4	1.6		25.8	0	74.2		7.2	92.8	0		60	20	20		
PHF	.000	.978	.313	.945	.500	.000	.639	.705	.591	.926	.000	.890	.250	.250	.250	.417	.909



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #1

File Name : H1711051  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

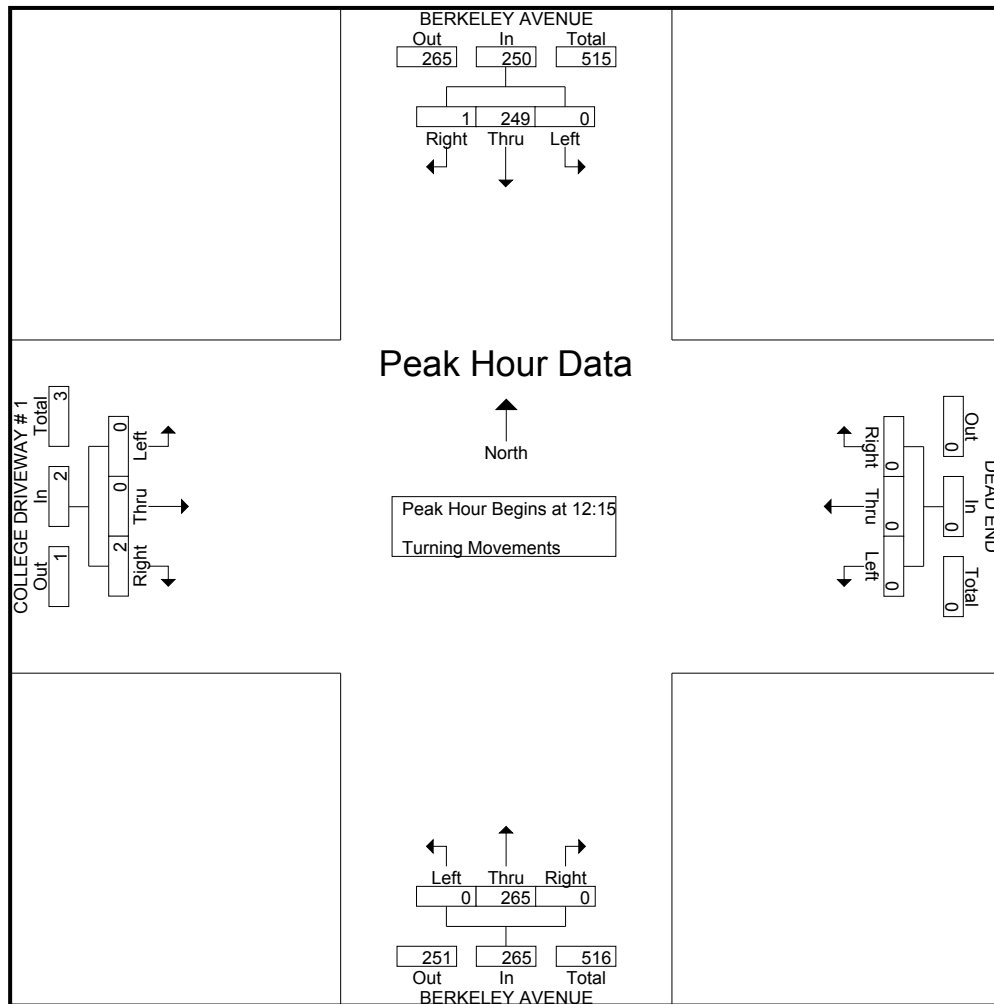
Groups Printed- Turning Movements

	BERKELEY AVENUE Southbound			DEAD END Westbound			BERKELEY AVENUE Northbound			COLLEGE DRIVEWAY # 1 Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	1	41	0	0	0	0	0	52	1	2	0	0	97
12:15	0	62	0	0	0	0	0	61	0	0	0	0	123
12:30	1	66	0	0	0	0	0	55	0	1	0	0	123
12:45	0	68	0	0	0	0	0	96	0	0	0	0	164
Total	2	237	0	0	0	0	0	264	1	3	0	0	507
13:00	0	53	0	0	0	0	0	53	0	1	0	0	107
13:15	0	44	0	0	0	0	0	50	4	1	0	0	99
13:30	0	33	0	0	0	0	0	58	1	3	0	1	96
13:45	0	54	0	0	0	0	0	54	1	1	0	1	111
Total	0	184	0	0	0	0	0	215	6	6	0	2	413
*** BREAK ***													
15:30	0	33	0	0	0	0	0	45	0	1	0	0	79
15:45	0	34	0	0	0	0	0	41	0	0	0	0	75
Total	0	67	0	0	0	0	0	86	0	1	0	0	154
16:00	0	59	0	0	0	0	0	40	0	1	0	1	101
16:15	0	41	0	0	0	0	0	42	1	4	0	1	89
16:30	0	52	0	0	0	0	0	44	0	0	0	0	96
16:45	1	24	0	0	0	0	0	43	0	1	0	0	69
Total	1	176	0	0	0	0	0	169	1	6	0	2	355
17:00	0	47	0	0	0	0	0	44	1	7	0	1	100
17:15	0	42	0	0	0	0	0	43	0	1	0	1	87
Grand Total	3	753	0	0	0	0	0	821	9	24	0	6	1616
Apprch %	0.4	99.6	0	0	0	0	0	98.9	1.1	80	0	20	
Total %	0.2	46.6	0	0	0	0	0	50.8	0.6	1.5	0	0.4	

City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #1

File Name : H1711051  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

	BERKELEY AVENUE Southbound				DEAD END Westbound				BERKELEY AVENUE Northbound				COLLEGE DRIVEWAY # 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	0	62	0	62	0	0	0	0	0	61	0	61	0	0	0	0	123
12:30	1	66	0	67	0	0	0	0	0	55	0	55	1	0	0	1	123
12:45	0	<b>68</b>	0	<b>68</b>	0	0	0	0	0	<b>96</b>	0	<b>96</b>	0	0	0	0	<b>164</b>
13:00	0	53	0	53	0	0	0	0	0	53	0	53	1	0	0	1	107
Total Volume	1	249	0	250	0	0	0	0	0	265	0	265	2	0	0	2	517
% App. Total	0.4	99.6	0		0	0	0		0	100	0		100	0	0		
PHF	.250	.915	.000	.919	.000	.000	.000	.000	.000	.690	.000	.690	.500	.000	.000	.500	.788

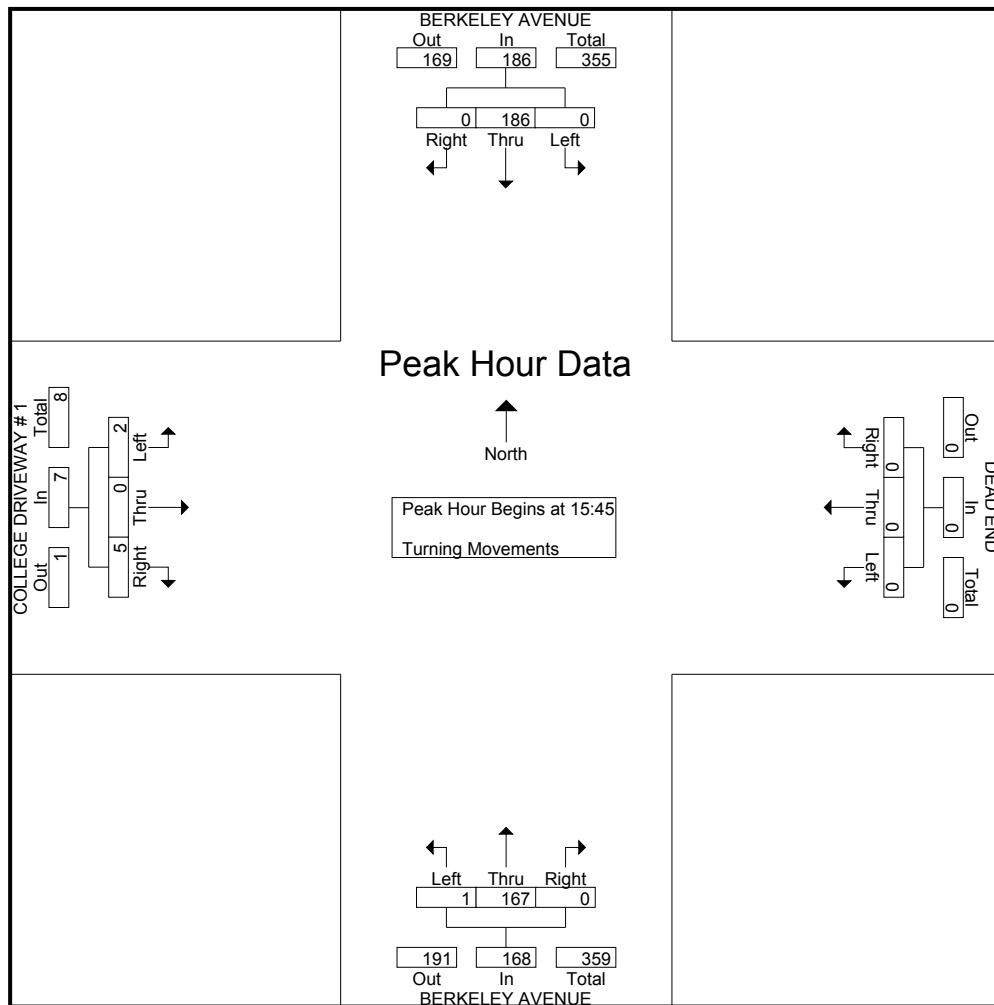




City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #1

File Name : H1711051  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	BERKELEY AVENUE Southbound				DEAD END Westbound				BERKELEY AVENUE Northbound				COLLEGE DRIVEWAY # 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:45																	
15:45	0	34	0	34	0	0	0	0	0	41	0	41	0	0	0	0	75
16:00	0	59	0	59	0	0	0	0	0	40	0	40	1	0	1	2	101
16:15	0	41	0	41	0	0	0	0	0	42	1	43	4	0	1	5	89
16:30	0	52	0	52	0	0	0	0	0	44	0	44	0	0	0	0	96
Total Volume	0	186	0	186	0	0	0	0	0	167	1	168	5	0	2	7	361
% App. Total	0	100	0		0	0	0		0	99.4	0.6		71.4	0	28.6		
PHF	.000	.788	.000	.788	.000	.000	.000	.000	.000	.949	.250	.955	.313	.000	.500	.350	.894



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #2

File Name : H1711052  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

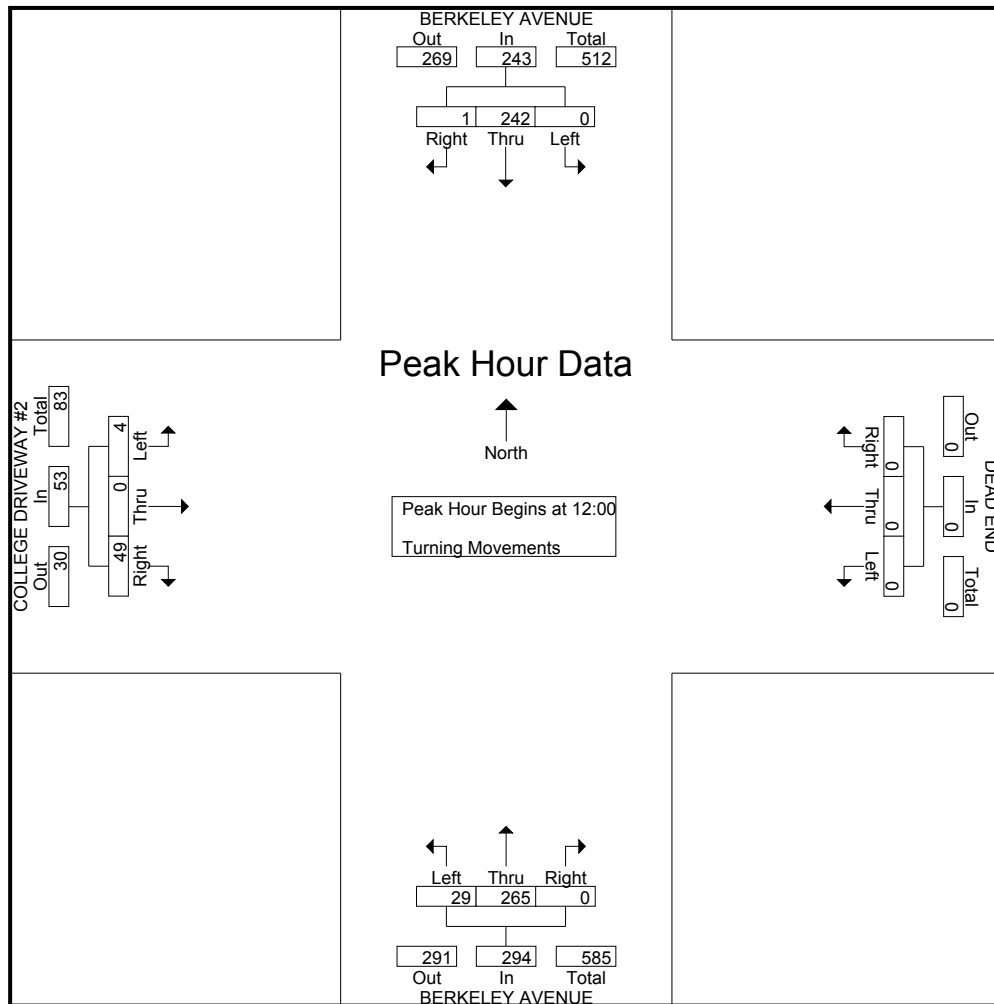
Groups Printed- Turning Movements

	BERKELEY AVENUE Southbound			DEAD END Westbound			BERKELEY AVENUE Northbound			COLLEGE DRIVEWAY #2 Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
12:00	0	44	0	0	0	0	0	51	7	25	0	2	129
12:15	1	67	0	0	0	0	0	61	6	9	0	1	145
12:30	0	61	0	0	0	0	0	55	9	6	0	1	132
12:45	0	70	0	0	0	0	0	98	7	9	0	0	184
Total	1	242	0	0	0	0	0	265	29	49	0	4	590
13:00	1	51	0	0	0	0	0	50	6	9	0	0	117
13:15	1	46	0	0	0	0	0	60	5	9	0	1	122
13:30	0	33	0	0	0	0	0	56	3	6	0	1	99
13:45	2	59	0	0	0	0	0	63	7	8	0	1	140
Total	4	189	0	0	0	0	0	229	21	32	0	3	478
*** BREAK ***													
15:30	1	36	0	0	0	0	0	47	0	5	0	0	89
15:45	0	39	0	0	0	0	0	40	2	5	0	1	87
Total	1	75	0	0	0	0	0	87	2	10	0	1	176
16:00	0	60	0	0	0	0	0	41	7	7	0	0	115
16:15	0	53	0	0	0	0	0	45	8	10	0	0	116
16:30	0	54	0	0	0	0	0	40	12	9	0	0	115
16:45	0	22	0	0	0	0	0	41	12	7	0	0	82
Total	0	189	0	0	0	0	0	167	39	33	0	0	428
17:00	0	54	0	0	0	0	0	43	8	18	0	0	123
17:15	0	44	0	0	0	0	0	45	6	4	0	0	99
Grand Total	6	793	0	0	0	0	0	836	105	146	0	8	1894
Apprch %	0.8	99.2	0	0	0	0	0	88.8	11.2	94.8	0	5.2	
Total %	0.3	41.9	0	0	0	0	0	44.1	5.5	7.7	0	0.4	

City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #2

File Name : H1711052  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

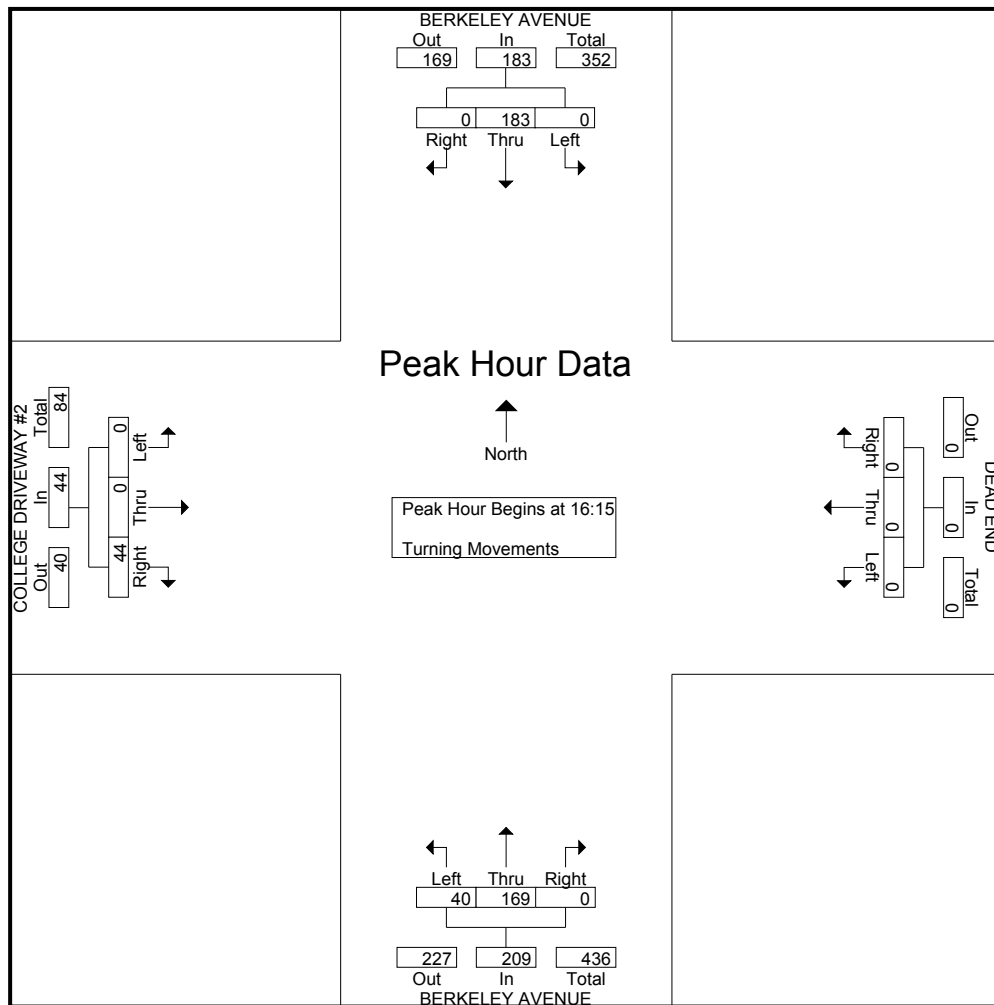
	BERKELEY AVENUE Southbound				DEAD END Westbound				BERKELEY AVENUE Northbound				COLLEGE DRIVEWAY #2 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	0	44	0	44	0	0	0	0	0	51	7	58	25	0	2	27	129
12:15	1	67	0	68	0	0	0	0	0	61	6	67	9	0	1	10	145
12:30	0	61	0	61	0	0	0	0	0	55	9	64	6	0	1	7	132
12:45	0	70	0	70	0	0	0	0	0	98	7	105	9	0	0	9	184
Total Volume	1	242	0	243	0	0	0	0	0	265	29	294	49	0	4	53	590
% App. Total	0.4	99.6	0		0	0	0		0	90.1	9.9		92.5	0	7.5		
PHF	.250	.864	.000	.868	.000	.000	.000	.000	.000	.676	.806	.700	.490	.000	.500	.491	.802



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: COLLEGE DRIVEWAY #2

File Name : H1711052  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	BERKELEY AVENUE Southbound				DEAD END Westbound				BERKELEY AVENUE Northbound				COLLEGE DRIVEWAY #2 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	0	53	0	53	0	0	0	0	0	45	8	53	10	0	0	10	116
16:30	0	54	0	54	0	0	0	0	0	40	12	52	9	0	0	9	115
16:45	0	22	0	22	0	0	0	0	0	41	12	53	7	0	0	7	82
17:00	0	54	0	54	0	0	0	0	0	43	8	51	18	0	0	18	123
Total Volume	0	183	0	183	0	0	0	0	0	169	40	209	44	0	0	44	436
% App. Total	0	100	0		0	0	0		0	80.9	19.1		100	0	0		
PHF	.000	.847	.000	.847	.000	.000	.000	.000	.000	.939	.833	.986	.611	.000	.000	.611	.886



City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: BROOKDALE PLACE

File Name : H1711053  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 1

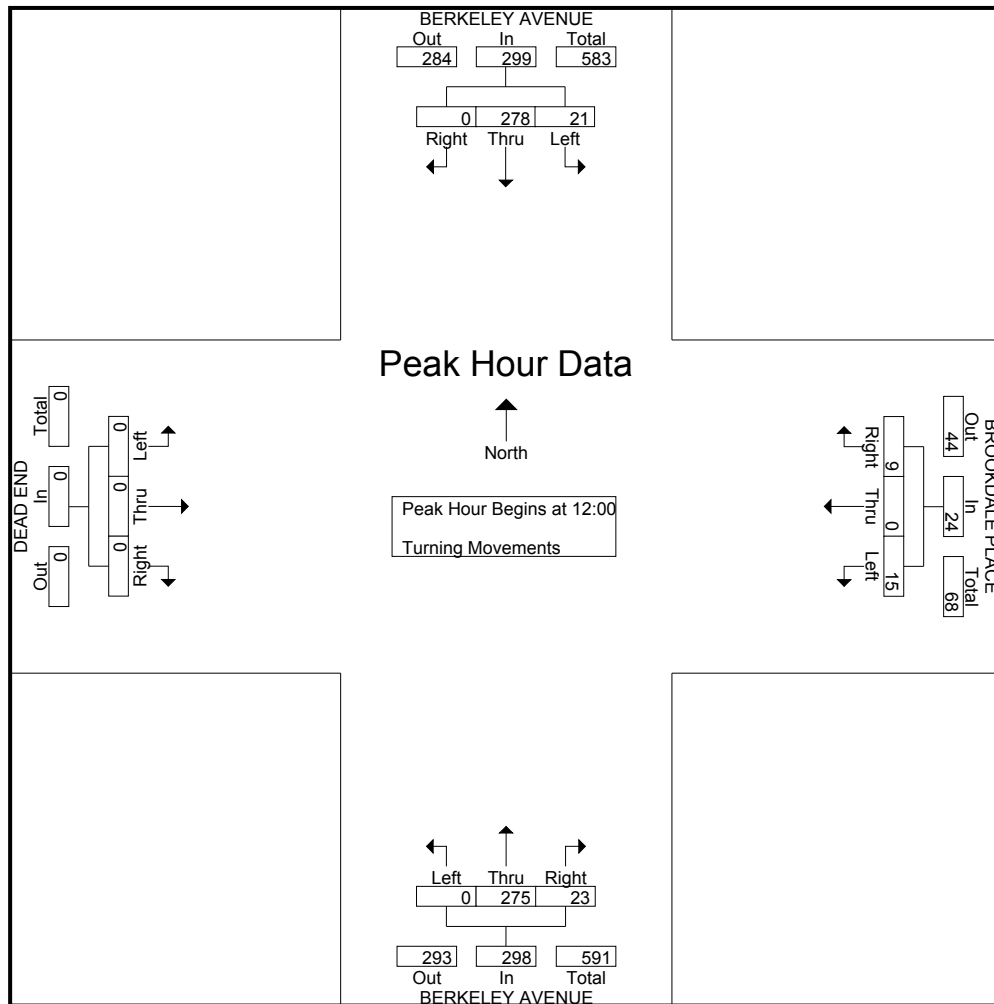
Groups Printed- Turning Movements

	BERKELEY AVENUE Southbound			BROOKDALE PLACE Westbound			BERKELEY AVENUE Northbound			DEAD END Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
12:00	0	71	3	0	0	3	3	56	0	0	0	0	136
12:15	0	71	6	1	0	3	4	63	0	0	0	0	148
12:30	0	66	5	4	0	1	7	57	0	0	0	0	140
12:45	0	70	7	4	0	8	9	99	0	0	0	0	197
Total	0	278	21	9	0	15	23	275	0	0	0	0	621
13:00	0	58	2	6	0	3	8	51	0	0	0	0	128
13:15	0	51	5	5	0	0	8	60	0	0	0	0	129
13:30	0	40	1	9	0	3	6	52	0	0	0	0	111
13:45	0	59	10	8	0	1	5	64	0	0	0	0	147
Total	0	208	18	28	0	7	27	227	0	0	0	0	515
*** BREAK ***													
15:30	0	34	6	4	0	6	4	43	0	0	0	0	97
15:45	0	41	2	5	0	2	5	37	0	0	0	0	92
Total	0	75	8	9	0	8	9	80	0	0	0	0	189
16:00	0	66	7	2	0	3	2	44	0	0	0	0	124
16:15	0	63	6	2	0	1	4	48	0	0	0	0	124
16:30	0	57	5	6	0	2	0	46	0	0	0	0	116
16:45	0	29	1	3	0	0	4	49	0	0	0	0	86
Total	0	215	19	13	0	6	10	187	0	0	0	0	450
17:00	0	66	7	2	0	1	5	49	0	0	0	0	130
17:15	0	44	4	5	0	9	6	44	0	0	0	0	112
Grand Total	0	886	77	66	0	46	80	862	0	0	0	0	2017
Apprch %	0	92	8	58.9	0	41.1	8.5	91.5	0	0	0	0	
Total %	0	43.9	3.8	3.3	0	2.3	4	42.7	0	0	0	0	

City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: BROOKDALE PLACE

File Name : H1711053  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 2

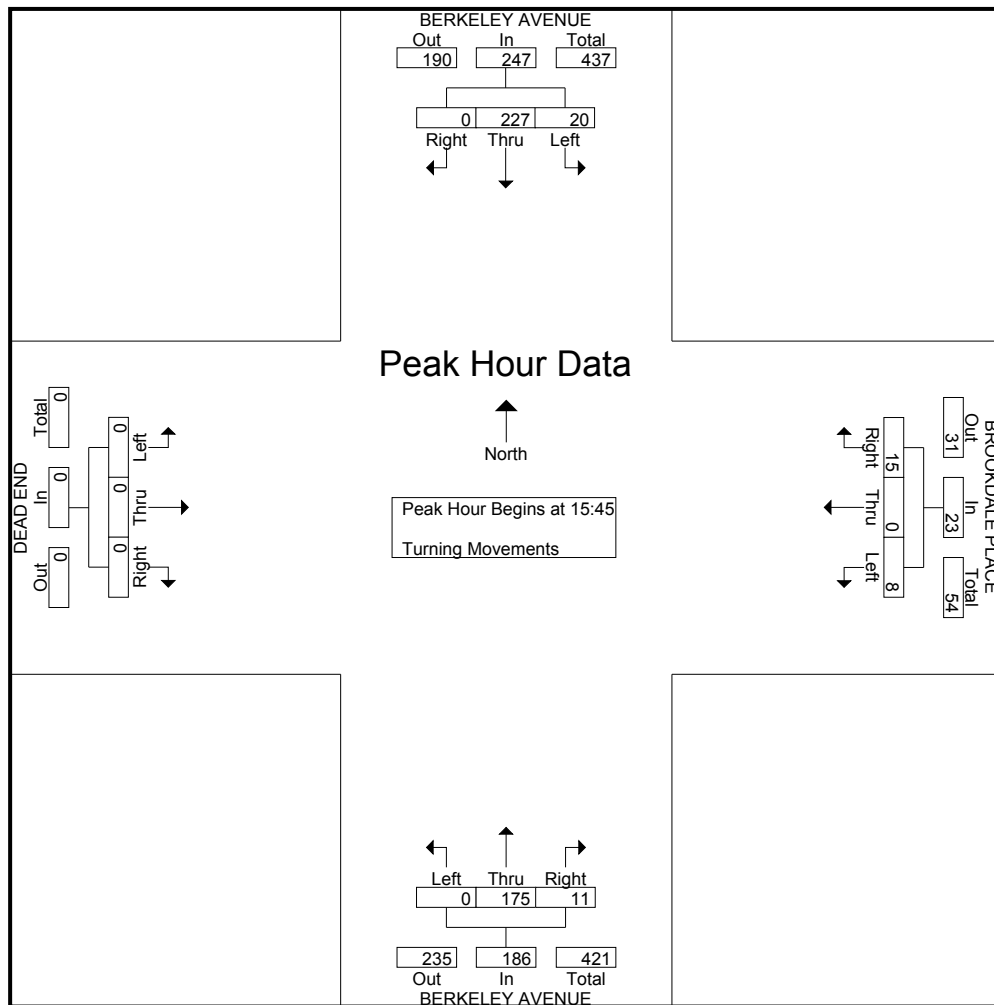
	BERKELEY AVENUE Southbound				BROOKDALE PLACE Westbound				BERKELEY AVENUE Northbound				DEAD END Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00																	
12:00	0	71	3	74	0	0	3	3	3	56	0	59	0	0	0	0	136
12:15	0	71	6	77	1	0	3	4	4	63	0	67	0	0	0	0	148
12:30	0	66	5	71	4	0	1	5	7	57	0	64	0	0	0	0	140
12:45	0	70	7	77	4	0	8	12	9	99	0	108	0	0	0	0	197
Total Volume	0	278	21	299	9	0	15	24	23	275	0	298	0	0	0	0	621
% App. Total	0	93	7		37.5	0	62.5		7.7	92.3	0		0	0	0		
PHF	.000	.979	.750	.971	.563	.000	.469	.500	.639	.694	.000	.690	.000	.000	.000	.000	.788

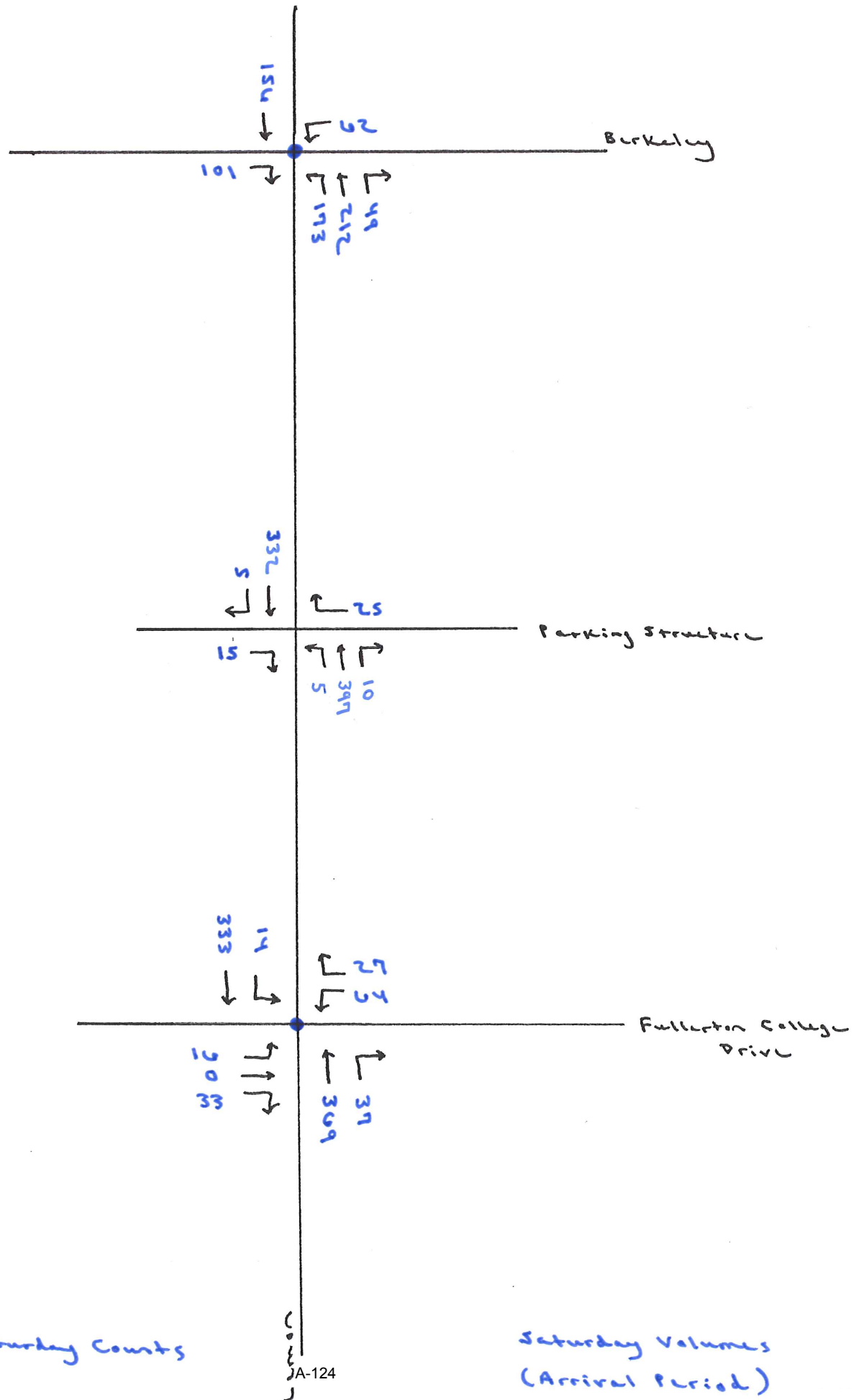


City: FULLERTON  
N-S Direction: BERKELEY AVENUE  
E-W Direction: BROOKDALE PLACE

File Name : H1711053  
Site Code : 00000000  
Start Date : 11/4/2017  
Page No : 3

	BERKELEY AVENUE Southbound				BROOKDALE PLACE Westbound				BERKELEY AVENUE Northbound				DEAD END Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 15:30 to 17:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:45																	
15:45	0	41	2	43	5	0	2	7	5	37	0	42	0	0	0	0	92
16:00	0	66	7	73	2	0	3	5	2	44	0	46	0	0	0	0	124
16:15	0	63	6	69	2	0	1	3	4	48	0	52	0	0	0	0	124
16:30	0	57	5	62	6	0	2	8	0	46	0	46	0	0	0	0	116
Total Volume	0	227	20	247	15	0	8	23	11	175	0	186	0	0	0	0	456
% App. Total	0	91.9	8.1		65.2	0	34.8		5.9	94.1	0		0	0	0		
PHF	.000	.860	.714	.846	.625	.000	.667	.719	.550	.911	.000	.894	.000	.000	.000	.000	.919

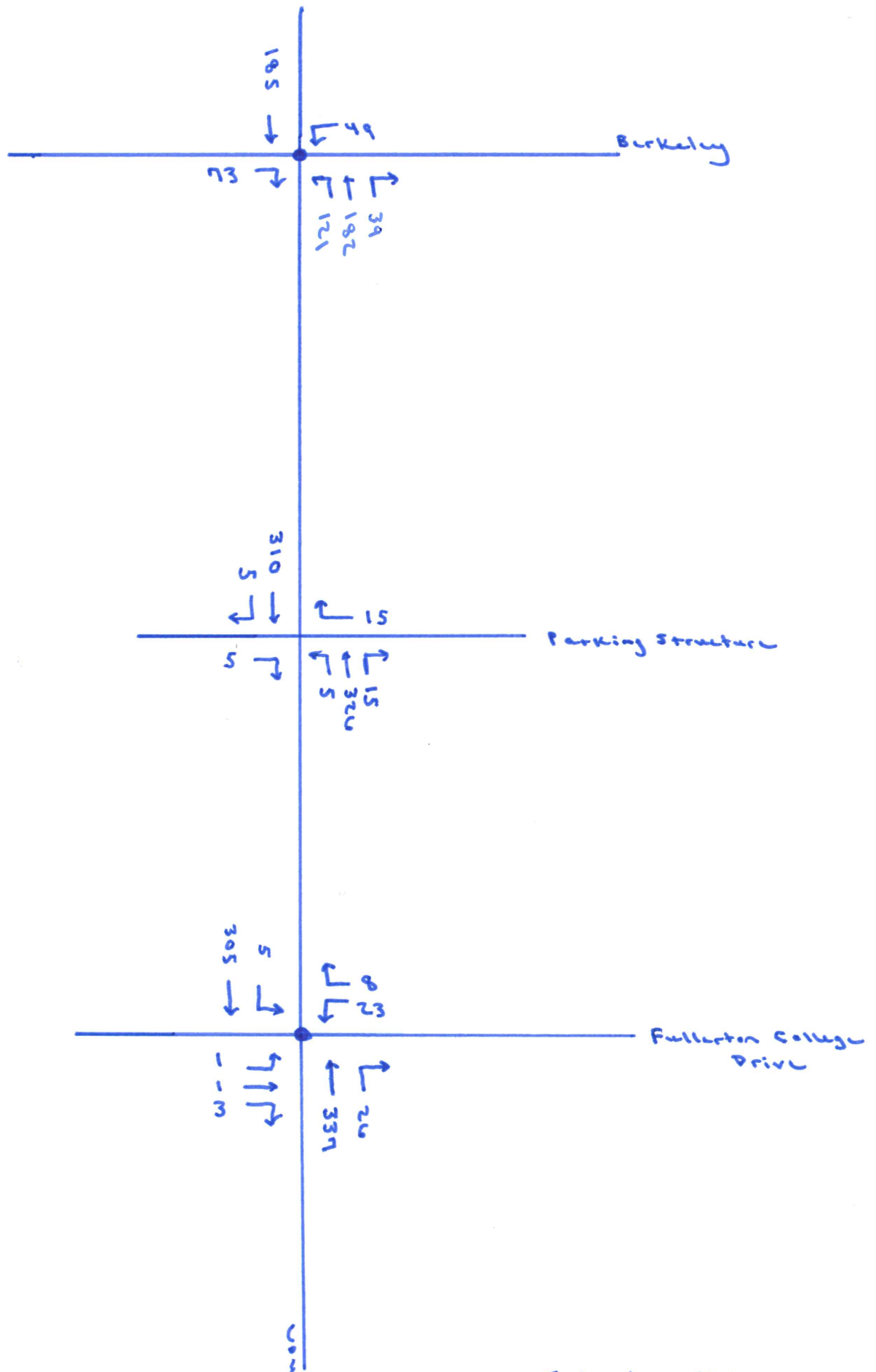




● = Based on Saturday Counts

Saturday Volumes  
(Arrival Period)





● = Based on Saturday Counts

Saturday Volumes  
(Departure Period)

*APPENDIX A-III*

**DAILY (24-HOUR) TRAFFIC COUNTS**

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : N. BERKELEY AVENUE

Segment : E/O LEMON STREET

Client : LL&G

Site: FULLERTON

Date: 10/06/17

Interval	EB				WB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	7	28	103	365	9	21	87	360	16	49	190	725		
12:15	8		98		6		100		14		198			
12:30	6		89		4		96		10		185			
12:45	7		75		2		77		9		152			
01:00	6	12	62	273	5	14	72	331	11	26	134	604		
01:15	1		59		3		88		4		147			
01:30	3		72		5		79		8		151			
01:45	2		80		1		92		3		172			
02:00	3	9	76	363	5	12	97	431	8	21	173	794		
02:15	3		82		3		89		6		171			
02:30	2		78		2		101		4		179			
02:45	1		127		2		144		3		271			
03:00	0	3	122	416	0	9	124	543	0	12	246	959		
03:15	1		103		4		159		5		262			
03:30	1		96		3		116		4		212			
03:45	1		95		2		144		3		239			
04:00	4	23	90	393	3	21	118	503	7	44	208	896		
04:15	1		105		6		103		7		208			
04:30	8		98		1		140		9		238			
04:45	10		100		11		142		21		242			
05:00	7	50	108	360	10	58	138	533	17	108	246	893		
05:15	8		88		9		145		17		233			
05:30	19		82		20		134		39		216			
05:45	16		82		19		116		35		198			
06:00	22	258	59	267	14	220	112	414	36	478	171	681		
06:15	38		78		43		118		81		196			
06:30	113		78		77		102		190		180			
06:45	85		52		86		82		171		134			
07:00	64	512	51	199	92	414	84	247	156	926	135	446		
07:15	100		54		78		66		178		120			
07:30	156		46		120		50		276		96			
07:45	192		48		124		47		316		95			
08:00	109	484	36	156	142	412	38	157	251	896	74	313		
08:15	109		47		94		48		203		95			
08:30	122		33		102		34		224		67			
08:45	144		40		74		37		218		77			
09:00	78	274	38	208	70	306	33	141	148	580	71	349		
09:15	64		32		81		34		145		66			
09:30	64		77		71		36		135		113			
09:45	68		61		84		38		152		99			
10:00	62	243	26	99	86	289	23	120	148	532	49	219		
10:15	56		25		58		33		114		58			
10:30	61		20		73		26		134		46			
10:45	64		28		72		38		136		66			
11:00	78	300	18	60	87	320	20	51	165	620	38	111		
11:15	60		18		76		18		136		36			
11:30	80		12		81		9		161		21			
11:45	82		12		76		4		158		16			
Totals	2,196		3,159		2,096		3,831		4,292		6,990			
Split%	51.2		45.2		48.8		54.8							
Day Totals		5,355				5,927				11,282				
Day Splits		47.5				52.5								
Peak Hour	07:30		02:45		07:30		04:30		07:30		02:45			
Volume	566		448		480		565		1,046		991			
Factor	0.74		0.88		0.85		0.97		0.83		0.91			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : E/O LEMON STREET  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	EB				WB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	8	29	70	245	9	25	77	288	17	54	147	533		
12:15	5		63		3		78		8		141			
12:30	8		54		9		64		17		118			
12:45	8		58		4		69		12		127			
01:00	10	25	62	252	3	18	85	301	13	43	147	553		
01:15	6		66		4		64		10		130			
01:30	6		53		8		76		14		129			
01:45	3		71		3		76		6		147			
02:00	11	17	58	234	8	18	70	253	19	35	128	487		
02:15	1		74		3		56		4		130			
02:30	2		48		3		56		5		104			
02:45	3		54		4		71		7		125			
03:00	4	10	61	216	4	5	64	212	8	15	125	428		
03:15	3		63		1		50		4		113			
03:30	3		51		0		50		3		101			
03:45	0		41		0		48		0		89			
04:00	2	6	39	177	3	11	44	212	5	17	83	389		
04:15	0		45		1		53		1		98			
04:30	3		48		5		64		8		112			
04:45	1		45		2		51		3		96			
05:00	2	16	40	200	7	34	56	223	9	50	96	423		
05:15	3		45		8		56		11		101			
05:30	9		61		7		52		16		113			
05:45	2		54		12		59		14		113			
06:00	9	59	36	167	17	71	60	186	26	130	96	353		
06:15	14		49		8		48		22		97			
06:30	14		46		16		44		30		90			
06:45	22		36		30		34		52		70			
07:00	13	130	40	131	30	180	50	145	43	310	90	276		
07:15	26		36		36		35		62		71			
07:30	35		26		48		32		83		58			
07:45	56		29		66		28		122		57			
08:00	38	241	31	123	46	239	33	100	84	480	64	223		
08:15	48		36		49		30		97		66			
08:30	70		27		64		25		134		52			
08:45	85		29		80		12		165		41			
09:00	74	269	27	103	54	247	25	87	128	516	52	190		
09:15	68		26		59		26		127		52			
09:30	59		23		60		16		119		39			
09:45	68		27		74		20		142		47			
10:00	42	230	29	86	82	336	34	99	124	566	63	185		
10:15	66		27		84		28		150		55			
10:30	60		18		74		19		134		37			
10:45	62		12		96		18		158		30			
11:00	58	247	14	52	69	305	19	66	127	552	33	118		
11:15	50		17		63		8		113		25			
11:30	72		13		83		18		155		31			
11:45	67		8		90		21		157		29			
Totals	1,279		1,986		1,489		2,172		2,768		4,158			
Split%	46.2		47.8		53.8		52.2							
Day Totals		3.265				3.661				6.926				
Day Splits		47.1				52.9								
Peak Hour	08:30		01:30		10:00		01:00		10:15		01:00			
Volume	297		256		336		301		569		553			
Factor	0.87		0.86		0.88		0.89		0.90		0.94			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : E/O LEMON STREET  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	EB				WB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	13	44	47	178	15	41	56	214	28	85	103	392		
12:15	9		42		11		46		20		88			
12:30	15		46		9		52		24		98			
12:45	7		43		6		60		13		103			
01:00	4	22	41	184	4	26	50	220	8	48	91	404		
01:15	6		53		7		52		13		105			
01:30	8		59		9		54		17		113			
01:45	4		31		6		64		10		95			
02:00	4	15	36	190	3	15	62	225	7	30	98	415		
02:15	5		40		5		50		10		90			
02:30	2		48		3		55		5		103			
02:45	4		66		4		58		8		124			
03:00	2	8	41	193	2	8	58	198	4	16	99	391		
03:15	2		48		1		50		3		98			
03:30	2		50		3		44		5		94			
03:45	2		54		2		46		4		100			
04:00	3	5	46	188	2	10	48	216	5	15	94	404		
04:15	1		35		2		57		3		92			
04:30	0		49		4		48		4		97			
04:45	1		58		2		63		3		121			
05:00	1	15	45	185	3	21	54	232	4	36	99	417		
05:15	5		44		5		63		10		107			
05:30	5		54		9		63		14		117			
05:45	4		42		4		52		8		94			
06:00	1	18	48	163	12	39	50	199	13	57	98	362		
06:15	2		39		6		45		8		84			
06:30	5		39		10		48		15		87			
06:45	10		37		11		56		21		93			
07:00	9	60	39	127	14	77	42	146	23	137	81	273		
07:15	15		29		20		48		35		77			
07:30	17		26		14		34		31		60			
07:45	19		33		29		22		48		55			
08:00	18	100	43	110	19	138	17	94	37	238	60	204		
08:15	18		26		31		30		49		56			
08:30	27		13		47		26		74		39			
08:45	37		28		41		21		78		49			
09:00	33	128	21	86	35	168	21	75	68	296	42	161		
09:15	29		22		48		24		77		46			
09:30	28		18		43		15		71		33			
09:45	38		25		42		15		80		40			
10:00	33	162	20	53	52	194	14	48	85	356	34	101		
10:15	40		18		47		11		87		29			
10:30	31		11		49		16		80		27			
10:45	58		4		46		7		104		11			
11:00	36	173	10	30	36	192	9	24	72	365	19	54		
11:15	47		9		53		6		100		15			
11:30	51		7		44		6		95		13			
11:45	39		4		59		3		98		7			
Totals	750		1,687		929		1,891		1,679		3,578			
Split%	44.7		47.1		55.3		52.9							
Day Totals		2,437				2,820				5,257				
Day Splits		46.4				53.6								
Peak Hour	10:45		02:45		10:00		04:45		10:45		04:45			
Volume	192		205		194		243		371		444			
Factor	0.83		0.78		0.93		0.96		0.89		0.92			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : E/O LEMON STREET  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	EB				WB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	6	23	104	400	7	22	104	378	13	45	208	778		
12:15	12		84		6		66		18		150			
12:30	2		106		7		84		9		190			
12:45	3		106		2		124		5		230			
01:00	4	15	110	424	6	15	132	520	10	30	242	944		
01:15	5		114		2		96		7		210			
01:30	4		89		3		142		7		231			
01:45	2		111		4		150		6		261			
02:00	2	7	77	419	3	10	138	605	5	17	215	1,024		
02:15	2		108		2		126		4		234			
02:30	2		103		3		169		5		272			
02:45	1		131		2		172		3		303			
03:00	2	6	124	452	0	6	174	746	2	12	298	1,198		
03:15	1		108		0		232		1		340			
03:30	2		118		3		162		5		280			
03:45	1		102		3		178		4		280			
04:00	2	17	102	483	8	22	176	715	10	39	278	1,198		
04:15	3		136		2		178		5		314			
04:30	4		121		5		190		9		311			
04:45	8		124		7		171		15		295			
05:00	7	56	117	448	7	64	152	685	14	120	269	1,133		
05:15	10		128		11		157		21		285			
05:30	13		100		19		178		32		278			
05:45	26		103		27		198		53		301			
06:00	26	368	100	432	18	150	166	596	44	518	266	1,028		
06:15	48		108		30		174		78		282			
06:30	106		122		42		144		148		266			
06:45	188		102		60		112		248		214			
07:00	158	684	69	237	52	321	79	292	210	1,005	148	529		
07:15	156		56		80		71		236		127			
07:30	168		68		102		80		270		148			
07:45	202		44		87		62		289		106			
08:00	156	504	38	151	81	321	73	230	237	825	111	381		
08:15	130		40		77		58		207		98			
08:30	107		31		95		56		202		87			
08:45	111		42		68		43		179		85			
09:00	110	436	54	162	111	364	48	198	221	800	102	360		
09:15	112		41		90		56		202		97			
09:30	102		31		71		42		173		73			
09:45	112		36		92		52		204		88			
10:00	104	314	24	69	82	304	31	72	186	618	55	141		
10:15	72		14		76		19		148		33			
10:30	72		20		72		10		144		30			
10:45	66		11		74		12		140		23			
11:00	98	452	15	42	76	422	10	32	174	874	25	74		
11:15	107		8		82		9		189		17			
11:30	150		6		158		5		308		11			
11:45	97		13		106		8		203		21			
Totals	2,882		3,719		2,021		5,069		4,903		8,788			
Split%	58.8		42.3		41.2		57.7							
Day Totals		6,601				7,090				13,691				
Day Splits		48.2				51.8								
Peak Hour	07:00		04:15		11:00		03:15		07:15		02:45			
Volume	684		498		422		748		1,032		1,221			
Factor	0.85		0.92		0.67		0.81		0.89		0.90			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : E/O LEMON STREET  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	EB				WB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	8	21	109	450	9	18	195	492	17	39	304	942		
12:15	4		108		4		97		8		205			
12:30	8		117		2		86		10		203			
12:45	1		116		3		114		4		230			
01:00	2	9	109	433	1	6	122	451	3	15	231	884		
01:15	1		111		2		127		3		238			
01:30	4		100		2		84		6		184			
01:45	2		113		1		118		3		231			
02:00	3	6	97	468	0	8	106	512	3	14	203	980		
02:15	1		98		1		96		2		194			
02:30	0		117		2		136		2		253			
02:45	2		156		5		174		7		330			
03:00	0	6	152	509	3	11	158	574	3	17	310	1,083		
03:15	2		126		1		175		3		301			
03:30	3		116		4		108		7		224			
03:45	1		115		3		133		4		248			
04:00	3	20	122	510	4	27	126	557	7	47	248	1,067		
04:15	3		136		6		146		9		282			
04:30	5		127		4		157		9		284			
04:45	9		125		13		128		22		253			
05:00	4	59	146	508	11	67	150	588	15	126	296	1,096		
05:15	10		122		10		156		20		278			
05:30	18		130		23		150		41		280			
05:45	27		110		23		132		50		242			
06:00	25	427	122	528	29	250	130	464	54	677	252	992		
06:15	69		108		42		111		111		219			
06:30	149		162		67		119		216		281			
06:45	184		136		112		104		296		240			
07:00	167	728	79	265	104	448	76	268	271	1,176	155	533		
07:15	146		62		98		74		244		136			
07:30	186		71		112		67		298		138			
07:45	229		53		134		51		363		104			
08:00	206	726	48	182	127	461	62	251	333	1,187	110	433		
08:15	188		43		114		49		302		92			
08:30	168		47		114		76		282		123			
08:45	164		44		106		64		270		108			
09:00	119	482	41	149	103	370	72	228	222	852	113	377		
09:15	134		38		95		48		229		86			
09:30	107		27		90		54		197		81			
09:45	122		43		82		54		204		97			
10:00	127	387	30	91	114	349	37	77	241	736	67	168		
10:15	92		24		86		19		178		43			
10:30	88		17		67		12		155		29			
10:45	80		20		82		9		162		29			
11:00	108	537	14	33	88	420	3	17	196	957	17	50		
11:15	132		7		78		5		210		12			
11:30	159		4		139		5		298		9			
11:45	138		8		115		4		253		12			
Totals	3,408		4,126		2,435		4,479		5,843		8,605			
Split%	58.3		47.9		41.7		52.1							
Day Totals		7,534				6,914				14,448				
Day Splits		52.1				47.9								
Peak Hour	07:30		02:30		07:45		02:30		07:30		02:30			
Volume	809		551		489		643		1,296		1,194			
Factor	0.88		0.88		0.91		0.92		0.89		0.90			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : HORNET WAY  
Segment : N/O BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/06/17

Interval	SB				NB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	4	7	33	144	3	13	36	138	7	20	69	282		
12:15	2		39		6		34		8		73			
12:30	1		34		1		44		2		78			
12:45	0		38		3		24		3		62			
01:00	4	7	42	136	0	4	19	111	4	11	61	247		
01:15	1		30		2		22		3		52			
01:30	2		32		2		33		4		65			
01:45	0		32		0		37		0		69			
02:00	1	5	48	214	3	6	28	140	4	11	76	354		
02:15	2		38		2		43		4		81			
02:30	1		41		0		32		1		73			
02:45	1		87		1		37		2		124			
03:00	0	2	60	259	0	1	44	185	0	3	104	444		
03:15	0		85		1		62		1		147			
03:30	1		56		0		40		1		96			
03:45	1		58		0		39		1		97			
04:00	0	5	54	186	0	1	35	143	0	6	89	329		
04:15	2		32		0		38		2		70			
04:30	1		44		0		32		1		76			
04:45	2		56		1		38		3		94			
05:00	4	23	50	196	0	3	50	131	4	26	100	327		
05:15	2		52		2		27		4		79			
05:30	9		48		1		24		10		72			
05:45	8		46		0		30		8		76			
06:00	6	136	50	166	7	118	24	114	13	254	74	280		
06:15	18		42		12		29		30		71			
06:30	50		38		52		36		102		74			
06:45	62		36		47		25		109		61			
07:00	54	244	32	85	10	171	16	80	64	415	48	165		
07:15	33		24		36		29		69		53			
07:30	77		17		68		20		145		37			
07:45	80		12		57		15		137		27			
08:00	88	212	13	65	20	92	14	67	108	304	27	132		
08:15	46		18		28		22		74		40			
08:30	28		17		24		16		52		33			
08:45	50		17		20		15		70		32			
09:00	41	151	11	62	22	82	20	110	63	233	31	172		
09:15	43		17		16		16		59		33			
09:30	32		14		19		36		51		50			
09:45	35		20		25		38		60		58			
10:00	49	142	8	58	26	98	13	47	75	240	21	105		
10:15	29		15		28		14		57		29			
10:30	28		18		20		8		48		26			
10:45	36		17		24		12		60		29			
11:00	40	149	10	24	26	98	6	23	66	247	16	47		
11:15	32		6		30		6		62		12			
11:30	48		5		24		1		72		6			
11:45	29		3		18		10		47		13			
Totals	1.083		1.595		687		1.289		1.770		2.884			
Split%	61.2		55.3		38.8		44.7							
Day Totals		2.678				1.976				4.654				
Day Splits		57.5				42.5								
Peak Hour	07:30		02:45		07:15		03:00		07:30		02:45			
Volume	291		288		181		185		464		471			
Factor	0.83		0.83		0.67		0.75		0.80		0.80			



# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : HORNET WAY  
Segment : N/O BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	SB				NB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	6	19	47	152	8	21	26	108	14	40	73	260		
12:15	0		38		2		39		2		77			
12:30	8		37		6		27		14		64			
12:45	5		30		5		16		10		46			
01:00	3	9	34	142	6	14	24	122	9	23	58	264		
01:15	3		34		2		30		5		64			
01:30	1		34		3		24		4		58			
01:45	2		40		3		44		5		84			
02:00	2	5	34	119	5	10	36	104	7	15	70	223		
02:15	0		26		2		22		2		48			
02:30	1		28		1		22		2		50			
02:45	2		31		2		24		4		55			
03:00	0	0	29	92	1	5	20	88	1	5	49	180		
03:15	0		19		2		20		2		39			
03:30	0		18		1		24		1		42			
03:45	0		26		1		24		1		50			
04:00	2	5	30	119	0	1	20	87	2	6	50	206		
04:15	0		34		0		16		0		50			
04:30	1		28		1		32		2		60			
04:45	2		27		0		19		2		46			
05:00	2	16	29	105	0	4	22	90	2	20	51	195		
05:15	4		22		0		28		4		50			
05:30	5		22		2		20		7		42			
05:45	5		32		2		20		7		52			
06:00	9	31	28	78	2	22	19	71	11	53	47	149		
06:15	3		20		3		20		6		40			
06:30	3		15		7		13		10		28			
06:45	16		15		10		19		26		34			
07:00	17	101	17	49	4	34	14	52	21	135	31	101		
07:15	30		11		6		12		36		23			
07:30	30		14		10		10		40		24			
07:45	24		7		14		16		38		23			
08:00	16	114	6	40	8	55	8	57	24	169	14	97		
08:15	20		20		12		16		32		36			
08:30	33		9		18		16		51		25			
08:45	45		5		17		17		62		22			
09:00	37	140	19	36	19	87	15	47	56	227	34	83		
09:15	30		8		16		8		46		16			
09:30	35		4		24		8		59		12			
09:45	38		5		28		16		66		21			
10:00	43	166	12	39	30	100	12	36	73	266	24	75		
10:15	50		12		22		12		72		24			
10:30	35		8		24		6		59		14			
10:45	38		7		24		6		62		13			
11:00	26	145	13	33	20	105	13	31	46	250	26	64		
11:15	34		5		22		9		56		14			
11:30	40		7		29		8		69		15			
11:45	45		8		34		1		79		9			
Totals	751		1,004		458		893		1,209		1,897			
Split%	62.1		52.9		37.9		47.1							
Day Totals		1,755				1,351				3,106				
Day Splits		56.5				43.5								
Peak Hour	09:30		12:00		11:00		01:15		09:30		01:15			
Volume	166		152		105		134		270		276			
Factor	0.83		0.81		0.77		0.76		0.92		0.82			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : HORNET WAY  
Segment : N/O BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	SB				NB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	5	19	26	107	8	24	16	74	13	43	42	181		
12:15	4		30		3		23		7		53			
12:30	6		30		6		20		12		50			
12:45	4		21		7		15		11		36			
01:00	0	12	20	95	2	16	15	80	2	28	35	175		
01:15	5		31		4		22		9		53			
01:30	4		22		8		30		12		52			
01:45	3		22		2		13		5		35			
02:00	1	6	36	119	2	9	16	75	3	15	52	194		
02:15	1		28		5		16		6		44			
02:30	1		26		1		13		2		39			
02:45	3		29		1		30		4		59			
03:00	2	6	22	88	0	3	30	98	2	9	52	186		
03:15	0		27		0		24		0		51			
03:30	0		19		1		22		1		41			
03:45	4		20		2		22		6		42			
04:00	0	0	25	115	2	3	23	86	2	3	48	201		
04:15	0		30		0		10		0		40			
04:30	0		24		0		17		0		41			
04:45	0		36		1		36		1		72			
05:00	0	5	30	110	0	4	20	86	0	9	50	196		
05:15	2		31		2		22		4		53			
05:30	3		29		0		24		3		53			
05:45	0		20		2		20		2		40			
06:00	7	14	36	104	0	5	14	59	7	19	50	163		
06:15	2		20		2		22		4		42			
06:30	3		22		1		8		4		30			
06:45	2		26		2		15		4		41			
07:00	1	29	14	55	2	16	26	67	3	45	40	122		
07:15	8		24		8		20		16		44			
07:30	8		12		2		8		10		20			
07:45	12		5		4		13		16		18			
08:00	4	73	15	51	10	35	24	57	14	108	39	108		
08:15	19		14		6		11		25		25			
08:30	30		10		7		8		37		18			
08:45	20		12		12		14		32		26			
09:00	17	99	10	28	11	46	10	45	28	145	20	73		
09:15	28		4		8		14		36		18			
09:30	36		7		17		10		53		17			
09:45	18		7		10		11		28		18			
10:00	26	108	4	16	14	67	6	22	40	175	10	38		
10:15	36		6		18		10		54		16			
10:30	23		4		13		4		36		8			
10:45	23		2		22		2		45		4			
11:00	16	101	3	16	16	72	3	16	32	173	6	32		
11:15	30		5		14		6		44		11			
11:30	21		6		19		4		40		10			
11:45	34		2		23		3		57		5			
Totals	472		904		300		765		772		1.669			
Split%	61.1		54.2		38.9		45.8							
Day Totals		1,376				1,065				2,441				
Day Splits		56.4				43.6								
Peak Hour	09:30		04:45		11:00		02:45		09:30		04:45			
Volume	116		126		72		106		175		228			
Factor	0.81		0.88		0.78		0.88		0.81		0.79			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : HORNET WAY  
Segment : N/O BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	SB				NB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	2	7	62	210	2	9	41	147	4	16	103	357		
12:15	2		38		3		26		5		64			
12:30	3		56		4		38		7		94			
12:45	0		54		0		42		0		96			
01:00	4	6	65	212	2	17	42	164	6	23	107	376		
01:15	1		53		10		38		11		91			
01:30	1		44		4		36		5		80			
01:45	0		50		1		48		1		98			
02:00	2	5	54	266	1	3	42	195	3	8	96	461		
02:15	2		66		1		41		3		107			
02:30	0		68		1		54		1		122			
02:45	1		78		0		58		1		136			
03:00	0	0	91	272	0	1	56	192	0	1	147	464		
03:15	0		83		1		41		1		124			
03:30	0		46		0		43		0		89			
03:45	0		52		0		52		0		104			
04:00	1	12	64	283	1	3	47	204	2	15	111	487		
04:15	2		77		1		64		3		141			
04:30	7		70		1		46		8		116			
04:45	2		72		0		47		2		119			
05:00	0	21	60	281	0	2	42	185	0	23	102	466		
05:15	8		65		0		54		8		119			
05:30	4		58		0		46		4		104			
05:45	9		98		2		43		11		141			
06:00	12	108	56	222	5	37	40	181	17	145	96	403		
06:15	18		73		6		49		24		122			
06:30	34		52		8		50		42		102			
06:45	44		41		18		42		62		83			
07:00	46	253	34	100	10	119	25	109	56	372	59	209		
07:15	52		15		33		20		85		35			
07:30	70		30		42		36		112		66			
07:45	85		21		34		28		119		49			
08:00	64	191	22	67	25	120	23	75	89	311	45	142		
08:15	50		12		33		14		83		26			
08:30	38		17		30		17		68		34			
08:45	39		16		32		21		71		37			
09:00	53	181	14	49	48	153	22	77	101	334	36	126		
09:15	46		9		47		18		93		27			
09:30	38		12		28		17		66		29			
09:45	44		14		30		20		74		34			
10:00	54	180	10	23	30	124	12	36	84	304	22	59		
10:15	44		5		28		7		72		12			
10:30	40		5		40		12		80		17			
10:45	42		3		26		5		68		8			
11:00	45	260	3	11	38	175	2	9	83	435	5	20		
11:15	54		3		36		2		90		5			
11:30	101		3		60		1		161		4			
11:45	60		2		41		4		101		6			
Totals	1,224		1,996		763		1,574		1,987		3,570			
Split%	61.6		55.9		38.4		44.1							
Day Totals		3,220				2,337				5,557				
Day Splits		57.9				42.1								
Peak Hour	07:15		02:30		11:00		02:15		11:00		02:30			
Volume	271		320		175		209		435		529			
Factor	0.80		0.88		0.73		0.90		0.68		0.90			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : HORNET WAY  
Segment : N/O BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	SB				NB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	4	8	48	198	4	8	23	145	8	16	71	343		
12:15	1		54		2		52		3		106			
12:30	2		51		2		40		4		91			
12:45	1		45		0		30		1		75			
01:00	0	3	68	202	1	5	25	169	1	8	93	371		
01:15	1		46		0		48		1		94			
01:30	2		30		4		40		6		70			
01:45	0		58		0		56		0		114			
02:00	0	2	50	277	1	4	52	203	1	6	102	480		
02:15	0		50		1		42		1		92			
02:30	0		82		0		47		0		129			
02:45	2		95		2		62		4		157			
03:00	1	1	69	295	0	1	66	219	1	2	135	514		
03:15	0		100		0		64		0		164			
03:30	0		63		1		46		1		109			
03:45	0		63		0		43		0		106			
04:00	0	10	47	242	1	1	40	193	1	11	87	435		
04:15	4		67		0		46		4		113			
04:30	3		66		0		58		3		124			
04:45	3		62		0		49		3		111			
05:00	5	31	78	285	0	10	47	188	5	41	125	473		
05:15	12		80		3		53		15		133			
05:30	7		58		3		52		10		110			
05:45	7		69		4		36		11		105			
06:00	9	170	73	238	3	111	48	204	12	281	121	442		
06:15	20		46		17		42		37		88			
06:30	53		69		46		66		99		135			
06:45	88		50		45		48		133		98			
07:00	88	345	38	94	18	161	41	118	106	506	79	212		
07:15	60		16		32		25		92		41			
07:30	88		24		61		26		149		50			
07:45	109		16		50		26		159		42			
08:00	111	313	22	79	44	188	19	83	155	501	41	162		
08:15	70		14		42		20		112		34			
08:30	64		24		54		22		118		46			
08:45	68		19		48		22		116		41			
09:00	50	198	16	51	31	127	18	96	81	325	34	147		
09:15	53		11		38		23		91		34			
09:30	58		12		30		36		88		48			
09:45	37		12		28		19		65		31			
10:00	58	168	9	16	51	128	14	37	109	296	23	53		
10:15	44		5		31		11		75		16			
10:30	30		2		22		8		52		10			
10:45	36		0		24		4		60		4			
11:00	46	219	0	4	32	170	0	11	78	389	0	15		
11:15	43		2		42		4		85		6			
11:30	62		0		50		3		112		3			
11:45	68		2		46		4		114		6			
Totals	1,468		1,981		914		1,666		2,382		3,647			
Split%	61.6		54.3		38.4		45.7							
Day Totals		3,449				2,580				6,029				
Day Splits		57.2				42.8								
Peak Hour	07:30		02:30		07:30		02:30		07:30		02:30			
Volume	378		346		197		239		575		585			
Factor	0.85		0.87		0.81		0.91		0.90		0.89			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : E. BROOKDALE PLACE  
Segment : E/O N. BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/06/17

Interval	EB				WB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	1	3	12	38	0	0	9	45	1	3	21	83		
12:15	0		10		0		18		0		28			
12:30	1		6		0		14		1		20			
12:45	1		10		0		4		1		14			
01:00	3	6	18	44	0	4	10	43	3	10	28	87		
01:15	2		8		0		10		2		18			
01:30	0		8		3		6		3		14			
01:45	1		10		1		17		2		27			
02:00	0	0	8	49	1	2	14	40	1	2	22	89		
02:15	0		13		1		12		1		25			
02:30	0		10		0		8		0		18			
02:45	0		18		0		6		0		24			
03:00	0	2	16	70	0	5	11	36	0	7	27	106		
03:15	2		24		5		10		7		34			
03:30	0		16		0		6		0		22			
03:45	0		14		0		9		0		23			
04:00	0	0	11	66	1	4	10	40	1	4	21	106		
04:15	0		16		1		10		1		26			
04:30	0		20		0		6		0		26			
04:45	0		19		2		14		2		33			
05:00	0	2	16	89	0	11	12	49	0	13	28	138		
05:15	0		25		4		10		4		35			
05:30	1		21		2		19		3		40			
05:45	1		27		5		8		6		35			
06:00	0	17	10	55	3	28	7	41	3	45	17	96		
06:15	2		12		7		10		9		22			
06:30	6		15		12		10		18		25			
06:45	9		18		6		14		15		32			
07:00	4	60	7	48	6	47	10	24	10	107	17	72		
07:15	8		10		7		10		15		20			
07:30	18		16		22		3		40		19			
07:45	30		15		12		1		42		16			
08:00	8	46	3	36	22	58	5	19	30	104	8	55		
08:15	14		12		10		4		24		16			
08:30	10		6		14		4		24		10			
08:45	14		15		12		6		26		21			
09:00	10	35	16	44	12	32	7	29	22	67	23	73		
09:15	10		7		8		5		18		12			
09:30	9		13		8		8		17		21			
09:45	6		8		4		9		10		17			
10:00	6	31	10	30	12	42	4	16	18	73	14	46		
10:15	4		4		12		2		16		6			
10:30	10		9		10		2		20		11			
10:45	11		7		8		8		19		15			
11:00	7	33	4	22	7	21	4	12	14	54	8	34		
11:15	6		10		6		4		12		14			
11:30	14		6		6		2		20		8			
11:45	6		2		2		2		8		4			
Totals	235		591		254		394		489		985			
Split%	48.1		60.0		51.9		40.0							
Day Totals		826				648			1,474					
Day Splits		56.0				44.0								
Peak Hour	07:30		05:00		07:30		04:45		07:30		05:00			
Volume	70		89		66		55		136		138			
Factor	0.58		0.82		0.75		0.72		0.81		0.86			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : E. BROOKDALE PLACE  
Segment : E/O N. BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	EB				WB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	3	4	5	33	1	3	4	41	4	7	9	74		
12:15	0		10		0		14		0		24			
12:30	0		12		0		12		0		24			
12:45	1		6		2		11		3		17			
01:00	0	2	11	52	0	2	6	28	0	4	17	80		
01:15	0		12		0		6		0		18			
01:30	2		15		1		8		3		23			
01:45	0		14		1		8		1		22			
02:00	0	9	6	39	3	7	4	26	3	16	10	65		
02:15	6		11		1		8		7		19			
02:30	1		14		1		6		2		20			
02:45	2		8		2		8		4		16			
03:00	0	3	14	47	2	2	4	17	2	5	18	64		
03:15	1		16		0		4		1		20			
03:30	0		8		0		8		0		16			
03:45	2		9		0		1		2		10			
04:00	0	0	6	29	1	2	2	22	1	2	8	51		
04:15	0		14		1		4		1		18			
04:30	0		1		0		10		0		11			
04:45	0		8		0		6		0		14			
05:00	0	0	6	30	0	2	2	38	0	2	8	68		
05:15	0		10		0		16		0		26			
05:30	0		2		1		12		1		14			
05:45	0		12		1		8		1		20			
06:00	0	5	8	42	1	10	14	32	1	15	22	74		
06:15	3		14		1		8		4		22			
06:30	1		4		2		8		3		12			
06:45	1		16		6		2		7		18			
07:00	0	16	9	33	3	37	7	19	3	53	16	52		
07:15	2		10		8		6		10		16			
07:30	4		8		9		4		13		12			
07:45	10		6		17		2		27		8			
08:00	10	30	12	32	12	48	1	18	22	78	13	50		
08:15	8		4		13		6		21		10			
08:30	8		10		9		9		17		19			
08:45	4		6		14		2		18		8			
09:00	12	34	6	32	6	37	4	12	18	71	10	44		
09:15	10		8		12		2		22		10			
09:30	10		4		10		4		20		8			
09:45	2		14		9		2		11		16			
10:00	9	32	4	23	11	47	8	14	20	79	12	37		
10:15	12		8		8		0		20		8			
10:30	5		5		8		4		13		9			
10:45	6		6		20		2		26		8			
11:00	7	44	4	15	12	32	0	8	19	76	4	23		
11:15	11		5		4		1		15		6			
11:30	10		2		10		3		20		5			
11:45	16		4		6		4		22		8			
Totals	179		407		229		275		408		682			
Split%	43.9		59.7		56.1		40.3							
Day Totals		586				504			1,090					
Day Splits		53.8				46.2								
Peak Hour	11:00		01:00		07:30		05:15		07:45		12:15			
Volume	44		52		51		50		87		82			
Factor	0.69		0.87		0.75		0.78		0.81		0.85			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : E. BROOKDALE PLACE  
Segment : E/O N. BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	EB				WB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	3	11	18	56	0	2	4	34	3	13	22	90		
12:15	4		14		0		4		4		18			
12:30	4		16		2		12		6		28			
12:45	0		8		0		14		0		22			
01:00	2	5	11	31	2	4	3	27	4	9	14	58		
01:15	1		6		1		4		2		10			
01:30	2		6		1		12		3		18			
01:45	0		8		0		8		0		16			
02:00	2	6	4	42	0	4	8	38	2	10	12	80		
02:15	2		8		2		10		4		18			
02:30	2		16		1		8		3		24			
02:45	0		14		1		12		1		26			
03:00	1	4	11	46	0	1	8	24	1	5	19	70		
03:15	1		5		0		9		1		14			
03:30	1		14		0		4		1		18			
03:45	1		16		1		3		2		19			
04:00	0	0	9	51	1	3	4	27	1	3	13	78		
04:15	0		13		0		2		0		15			
04:30	0		10		2		12		2		22			
04:45	0		19		0		9		0		28			
05:00	0	0	12	39	0	0	5	30	0	0	17	69		
05:15	0		7		0		9		0		16			
05:30	0		8		0		8		0		16			
05:45	0		12		0		8		0		20			
06:00	0	2	14	46	2	7	8	29	2	9	22	75		
06:15	0		9		3		7		3		16			
06:30	1		15		2		8		3		23			
06:45	1		8		0		6		1		14			
07:00	1	7	10	37	3	12	12	33	4	19	22	70		
07:15	2		13		1		6		3		19			
07:30	2		4		4		7		6		11			
07:45	2		10		4		8		6		18			
08:00	4	26	7	19	10	40	1	12	14	66	8	31		
08:15	5		4		10		4		15		8			
08:30	8		4		12		4		20		8			
08:45	9		4		8		3		17		7			
09:00	10	22	9	19	0	23	1	6	10	45	10	25		
09:15	2		1		6		2		8		3			
09:30	7		1		4		0		11		1			
09:45	3		8		13		3		16		11			
10:00	6	37	7	13	14	36	1	7	20	73	8	20		
10:15	11		1		9		1		20		2			
10:30	6		3		8		4		14		7			
10:45	14		2		5		1		19		3			
11:00	6	38	1	4	12	40	4	7	18	78	5	11		
11:15	13		0		8		1		21		1			
11:30	13		3		8		1		21		4			
11:45	6		0		12		1		18		1			
Totals	158		403		172		274		330		677			
Split%	47.9		59.5		52.1		40.5							
Day Totals		561				446			1,007					
Day Splits		55.7				44.3								
Peak Hour	10:45		12:00		09:45		01:30		10:45		12:00			
Volume	46		56		44		38		79		90			
Factor	0.82		0.78		0.79		0.79		0.94		0.80			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : E. BROOKDALE PLACE  
Segment : E/O N. BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	EB				WB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	4	10	7	51	2	3	22	56	6	13	29	107		
12:15	2		20		1		8		3		28			
12:30	4		8		0		10		4		18			
12:45	0		16		0		16		0		32			
01:00	2	6	11	40	4	6	17	66	6	12	28	106		
01:15	4		14		0		27		4		41			
01:30	0		10		2		10		2		20			
01:45	0		5		0		12		0		17			
02:00	1	1	14	49	1	1	12	53	2	2	26	102		
02:15	0		8		0		15		0		23			
02:30	0		13		0		14		0		27			
02:45	0		14		0		12		0		26			
03:00	0	1	21	57	0	0	14	59	0	1	35	116		
03:15	0		14		0		18		0		32			
03:30	0		10		0		8		0		18			
03:45	1		12		0		19		1		31			
04:00	0	0	8	67	0	2	15	43	0	2	23	110		
04:15	0		20		1		12		1		32			
04:30	0		16		1		10		1		26			
04:45	0		23		0		6		0		29			
05:00	1	2	19	62	4	13	12	48	5	15	31	110		
05:15	1		17		3		8		4		25			
05:30	0		14		3		18		3		32			
05:45	0		12		3		10		3		22			
06:00	1	21	10	71	4	30	10	42	5	51	20	113		
06:15	1		24		3		13		4		37			
06:30	7		24		15		7		22		31			
06:45	12		13		8		12		20		25			
07:00	6	19	10	29	10	44	6	31	16	63	16	60		
07:15	3		8		12		8		15		16			
07:30	4		5		8		5		12		10			
07:45	6		6		14		12		20		18			
08:00	17	84	10	32	10	40	6	20	27	124	16	52		
08:15	21		8		8		6		29		14			
08:30	20		4		8		4		28		8			
08:45	26		10		14		4		40		14			
09:00	26	101	4	26	18	69	0	17	44	170	4	43		
09:15	21		10		18		8		39		18			
09:30	28		6		18		3		46		9			
09:45	26		6		15		6		41		12			
10:00	11	38	4	14	16	48	2	6	27	86	6	20		
10:15	14		2		12		0		26		2			
10:30	6		5		14		2		20		7			
10:45	7		3		6		2		13		5			
11:00	12	61	3	11	11	71	3	6	23	132	6	17		
11:15	21		6		13		0		34		6			
11:30	18		1		28		1		46		2			
11:45	10		1		19		2		29		3			
Totals	344		509		327		447		671		956			
Split%	51.3		53.2		48.7		46.8							
Day Totals		853				774				1,627				
Day Splits		52.4				47.6								
Peak Hour	08:45		04:15		11:00		12:30		09:00		12:45			
Volume	101		78		71		70		170		121			
Factor	0.90		0.85		0.63		0.65		0.92		0.74			



# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : E. BROOKDALE PLACE  
Segment : E/O N. BERKELEY AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	EB				WB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	0	4	10	49	0	2	10	40	0	6	20	89		
12:15	4		16		0		8		4		24			
12:30	0		14		1		9		1		23			
12:45	0		9		1		13		1		22			
01:00	0	1	14	62	0	0	10	54	0	1	24	116		
01:15	0		16		0		18		0		34			
01:30	0		14		0		12		0		26			
01:45	1		18		0		14		1		32			
02:00	1	1	15	59	0	0	10	50	1	1	25	109		
02:15	0		12		0		14		0		26			
02:30	0		13		0		12		0		25			
02:45	0		19		0		14		0		33			
03:00	0	1	21	55	0	0	16	48	0	1	37	103		
03:15	0		14		0		11		0		25			
03:30	0		8		0		12		0		20			
03:45	1		12		0		9		1		21			
04:00	0	1	16	64	0	3	10	42	0	4	26	106		
04:15	0		10		0		12		0		22			
04:30	0		14		0		10		0		24			
04:45	1		24		3		10		4		34			
05:00	0	5	26	76	1	13	14	59	1	18	40	135		
05:15	0		13		4		16		4		29			
05:30	0		19		4		11		4		30			
05:45	5		18		4		18		9		36			
06:00	0	15	20	71	8	34	12	56	8	49	32	127		
06:15	2		26		4		16		6		42			
06:30	4		11		10		14		14		25			
06:45	9		14		12		14		21		28			
07:00	3	48	9	37	14	60	10	34	17	108	19	71		
07:15	8		11		12		8		20		19			
07:30	12		12		16		6		28		18			
07:45	25		5		18		10		43		15			
08:00	20	61	10	35	20	56	8	21	40	117	18	56		
08:15	13		12		13		4		26		16			
08:30	12		8		14		6		26		14			
08:45	16		5		9		3		25		8			
09:00	18	71	6	29	10	42	4	20	28	113	10	49		
09:15	18		12		10		6		28		18			
09:30	16		6		13		4		29		10			
09:45	19		5		9		6		28		11			
10:00	8	40	12	19	13	42	4	7	21	82	16	26		
10:15	17		2		17		0		34		2			
10:30	6		3		4		1		10		4			
10:45	9		2		8		2		17		4			
11:00	7	61	4	9	17	66	2	6	24	127	6	15		
11:15	12		0		9		1		21		1			
11:30	20		2		16		2		36		4			
11:45	22		3		24		1		46		4			
Totals	309		565		318		437		627		1,002			
Split%	49.3		56.4		50.7		43.6							
Day Totals		874				755			1,629					
Day Splits		53.7				46.3								
Peak Hour	09:00		05:30		07:30		05:45		07:30		05:30			
Volume	71		83		67		60		137		140			
Factor	0.93		0.80		0.84		0.83		0.80		0.83			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : LEMON STREET  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/06/17

Interval	NB				SB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	15	56	182	621	22	47	178	593	37	103	360	1,214		
12:15	12		170		7		177		19		347			
12:30	11		135		11		121		22		256			
12:45	18		134		7		117		25		251			
01:00	7	31	132	584	6	24	146	571	13	55	278	1,155		
01:15	10		128		5		143		15		271			
01:30	8		158		4		110		12		268			
01:45	6		166		9		172		15		338			
02:00	3	13	152	644	3	17	139	590	6	30	291	1,234		
02:15	4		136		3		146		7		282			
02:30	1		160		4		123		5		283			
02:45	5		196		7		182		12		378			
03:00	4	25	177	765	2	5	155	615	6	30	332	1,380		
03:15	6		204		2		139		8		343			
03:30	9		192		0		173		9		365			
03:45	6		192		1		148		7		340			
04:00	9	39	183	879	0	31	162	737	9	70	345	1,616		
04:15	4		206		5		180		9		386			
04:30	13		248		16		198		29		446			
04:45	13		242		10		197		23		439			
05:00	11	113	258	1,006	5	84	168	638	16	197	426	1,644		
05:15	20		268		14		164		34		432			
05:30	40		218		24		168		64		386			
05:45	42		262		41		138		83		400			
06:00	26	324	218	945	32	311	112	486	58	635	330	1,431		
06:15	52		254		62		114		114		368			
06:30	148		241		116		128		264		369			
06:45	98		232		101		132		199		364			
07:00	116	771	197	634	100	631	118	374	216	1,402	315	1,008		
07:15	136		197		157		100		293		297			
07:30	259		138		172		78		431		216			
07:45	260		102		202		78		462		180			
08:00	180	813	100	366	198	637	82	289	378	1,450	182	655		
08:15	194		100		146		70		340		170			
08:30	203		78		160		67		363		145			
08:45	236		88		133		70		369		158			
09:00	108	447	68	402	84	334	50	502	192	781	118	904		
09:15	106		88		80		84		186		172			
09:30	100		114		74		135		174		249			
09:45	133		132		96		233		229		365			
10:00	116	476	84	301	129	483	88	252	245	959	172	553		
10:15	112		72		106		62		218		134			
10:30	120		78		108		44		228		122			
10:45	128		67		140		58		268		125			
11:00	137	531	63	163	106	537	38	103	243	1,068	101	266		
11:15	122		47		147		28		269		75			
11:30	142		29		136		22		278		51			
11:45	130		24		148		15		278		39			
Totals	3,639		7,310		3,141		5,750		6,780		13,060			
Split%	53.7		56.0		46.3		44.0							
Day Totals		10,949				8,891				19,840				
Day Splits		55.2				44.8								
Peak Hour	07:30		04:30		07:15		04:15		07:30		04:30			
Volume	893		1,016		729		743		1,611		1,743			
Factor	0.86		0.95		0.90		0.94		0.87		0.98			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : LEMON STREET  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	NB				SB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	22	90	112	437	24	68	93	430	46	158	205	867		
12:15	34		116		18		128		52		244			
12:30	16		104		14		88		30		192			
12:45	18		105		12		121		30		226			
01:00	13	66	116	436	12	38	111	387	25	104	227	823		
01:15	16		100		10		118		26		218			
01:30	19		112		6		74		25		186			
01:45	18		108		10		84		28		192			
02:00	22	46	90	386	23	41	84	360	45	87	174	746		
02:15	9		102		8		107		17		209			
02:30	11		88		6		81		17		169			
02:45	4		106		4		88		8		194			
03:00	5	26	88	353	5	25	102	372	10	51	190	725		
03:15	6		89		8		102		14		191			
03:30	7		96		9		98		16		194			
03:45	8		80		3		70		11		150			
04:00	3	22	88	386	3	16	74	298	6	38	162	684		
04:15	2		98		3		67		5		165			
04:30	3		98		6		80		9		178			
04:45	14		102		4		77		18		179			
05:00	10	60	82	341	2	35	76	291	12	95	158	632		
05:15	8		85		12		67		20		152			
05:30	16		92		4		76		20		168			
05:45	26		82		17		72		43		154			
06:00	14	91	95	373	13	72	72	270	27	163	167	643		
06:15	19		94		19		60		38		154			
06:30	18		98		24		73		42		171			
06:45	40		86		16		65		56		151			
07:00	36	350	100	271	34	191	58	191	70	541	158	462		
07:15	59		71		27		52		86		123			
07:30	100		54		46		45		146		99			
07:45	155		46		84		36		239		82			
08:00	91	444	52	200	78	313	40	167	169	757	92	367		
08:15	77		56		69		42		146		98			
08:30	116		48		70		48		186		96			
08:45	160		44		96		37		256		81			
09:00	108	374	54	214	87	342	32	161	195	716	86	375		
09:15	83		51		86		50		169		101			
09:30	80		60		83		41		163		101			
09:45	103		49		86		38		189		87			
10:00	92	386	56	200	92	349	31	153	184	735	87	353		
10:15	90		38		96		30		186		68			
10:30	88		51		77		28		165		79			
10:45	116		55		84		64		200		119			
11:00	96	412	58	185	114	374	21	109	210	786	79	294		
11:15	102		54		84		38		186		92			
11:30	102		30		98		26		200		56			
11:45	112		43		78		24		190		67			
Totals	2,367		3,782		1,864		3,189		4,231		6,971			
Split%	55.9		54.3		44.1		45.7							
Day Totals		6,149				5,053				11,202				
Day Splits		54.9				45.1								
Peak Hour	08:30		12:15		10:45		12:15		08:30		12:15			
Volume	467		441		380		448		806		889			
Factor	0.73		0.95		0.83		0.88		0.79		0.91			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : LEMON STREET  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	NB				SB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	20	136	64	280	10	58	56	212	30	194	120	492		
12:15	44		80		15		52		59		132			
12:30	48		64		21		52		69		116			
12:45	24		72		12		52		36		124			
01:00	29	79	73	347	6	33	67	267	35	112	140	614		
01:15	16		92		11		56		27		148			
01:30	18		90		4		80		22		170			
01:45	16		92		12		64		28		156			
02:00	9	30	72	316	1	16	78	291	10	46	150	607		
02:15	8		74		4		68		12		142			
02:30	5		84		7		71		12		155			
02:45	8		86		4		74		12		160			
03:00	4	22	90	321	4	22	58	234	8	44	148	555		
03:15	7		65		4		64		11		129			
03:30	5		95		10		56		15		151			
03:45	6		71		4		56		10		127			
04:00	6	17	84	316	3	14	48	228	9	31	132	544		
04:15	4		68		6		47		10		115			
04:30	4		79		4		71		8		150			
04:45	3		85		1		62		4		147			
05:00	4	32	84	297	4	30	70	235	8	62	154	532		
05:15	9		75		4		54		13		129			
05:30	11		54		8		53		19		107			
05:45	8		84		14		58		22		142			
06:00	10	56	48	232	7	42	62	237	17	98	110	469		
06:15	9		67		11		62		20		129			
06:30	19		53		14		55		33		108			
06:45	18		64		10		58		28		122			
07:00	19	104	52	220	12	74	54	162	31	178	106	382		
07:15	17		60		18		42		35		102			
07:30	34		44		24		34		58		78			
07:45	34		64		20		32		54		96			
08:00	22	133	56	206	38	170	52	134	60	303	108	340		
08:15	30		54		35		28		65		82			
08:30	37		60		53		30		90		90			
08:45	44		36		44		24		88		60			
09:00	53	230	40	161	42	232	24	84	95	462	64	245		
09:15	56		43		52		22		108		65			
09:30	61		52		52		22		113		74			
09:45	60		26		86		16		146		42			
10:00	60	223	30	114	52	222	20	56	112	445	50	170		
10:15	49		29		52		8		101		37			
10:30	54		19		58		16		112		35			
10:45	60		36		60		12		120		48			
11:00	74	321	16	61	55	278	8	30	129	599	24	91		
11:15	80		20		84		14		164		34			
11:30	86		12		73		4		159		16			
11:45	81		13		66		4		147		17			
Totals	1,383		2,871		1,191		2,170		2,574		5,041			
Split%	53.7		57.0		46.3		43.0							
Day Totals		4,254				3,361				7,615				
Day Splits		55.9				44.1								
Peak Hour	11:00		01:00		11:00		02:00		11:00		01:15			
Volume	321		347		278		291		599		624			
Factor	0.93		0.94		0.83		0.93		0.91		0.92			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : LEMON STREET  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	NB				SB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	14	55	149	680	9	31	112	542	23	86	261	1,222		
12:15	18		168		10		126		28		294			
12:30	15		171		8		128		23		299			
12:45	8		192		4		176		12		368			
01:00	11	28	201	805	4	18	158	657	15	46	359	1,462		
01:15	7		220		6		206		13		426			
01:30	6		178		2		148		8		326			
01:45	4		206		6		145		10		351			
02:00	4	16	162	694	4	7	161	873	8	23	323	1,567		
02:15	6		138		2		137		8		275			
02:30	2		170		1		193		3		363			
02:45	4		224		0		382		4		606			
03:00	4	26	242	898	4	11	361	854	8	37	603	1,752		
03:15	7		230		3		158		10		388			
03:30	12		224		2		157		14		381			
03:45	3		202		2		178		5		380			
04:00	6	44	234	988	2	49	235	866	8	93	469	1,854		
04:15	4		263		10		203		14		466			
04:30	18		225		20		216		38		441			
04:45	16		266		17		212		33		478			
05:00	18	151	236	1,041	11	101	197	800	29	252	433	1,841		
05:15	34		272		26		219		60		491			
05:30	46		276		28		199		74		475			
05:45	53		257		36		185		89		442			
06:00	54	672	266	1,130	48	364	150	698	102	1,036	416	1,828		
06:15	117		302		60		142		177		444			
06:30	219		310		124		218		343		528			
06:45	282		252		132		188		414		440			
07:00	216	1,066	182	534	132	687	150	440	348	1,753	332	974		
07:15	224		122		171		112		395		234			
07:30	293		120		180		94		473		214			
07:45	333		110		204		84		537		194			
08:00	310	870	60	266	192	703	96	422	502	1,573	156	688		
08:15	224		65		174		68		398		133			
08:30	160		67		162		114		322		181			
08:45	176		74		175		144		351		218			
09:00	157	641	106	327	148	569	126	491	305	1,210	232	818		
09:15	164		74		126		131		290		205			
09:30	154		75		152		146		306		221			
09:45	166		72		143		88		309		160			
10:00	174	570	55	150	209	596	71	208	383	1,166	126	358		
10:15	125		44		148		36		273		80			
10:30	151		36		132		87		283		123			
10:45	120		15		107		14		227		29			
11:00	146	690	30	77	96	556	24	60	242	1,246	54	137		
11:15	162		16		117		12		279		28			
11:30	199		14		181		12		380		26			
11:45	183		17		162		12		345		29			
Totals	4,829		7,590		3,692		6,911		8,521		14,501			
Split%	56.7		52.3		43.3		47.7							
Day Totals		12,419				10,603				23,022				
Day Splits		53.9				46.1								
Peak Hour	07:15		05:45		07:30		02:30		07:30		02:45			
Volume	1,160		1,135		750		1,094		1,910		1,978			
Factor	0.87		0.92		0.92		0.72		0.89		0.82			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : LEMON STREET  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	NB				SB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	14	47	172	748	10	27	154	578	24	74	326	1,326		
12:15	10		184		5		154		15		338			
12:30	18		201		1		136		19		337			
12:45	5		191		11		134		16		325			
01:00	8	28	194	762	8	21	160	730	16	49	354	1,492		
01:15	10		202		3		208		13		410			
01:30	2		178		8		156		10		334			
01:45	8		188		2		206		10		394			
02:00	2	11	170	788	6	15	190	712	8	26	360	1,500		
02:15	3		172		3		116		6		288			
02:30	4		200		4		160		8		360			
02:45	2		246		2		246		4		492			
03:00	4	32	260	970	6	19	218	724	10	51	478	1,694		
03:15	8		266		1		182		9		448			
03:30	12		230		8		146		20		376			
03:45	8		214		4		178		12		392			
04:00	5	50	226	1,037	4	40	216	878	9	90	442	1,915		
04:15	10		239		10		230		20		469			
04:30	16		290		14		216		30		506			
04:45	19		282		12		216		31		498			
05:00	20	171	265	1,203	8	106	216	802	28	277	481	2,005		
05:15	38		286		22		191		60		477			
05:30	53		302		38		210		91		512			
05:45	60		350		38		185		98		535			
06:00	72	645	276	1,186	50	418	192	730	122	1,063	468	1,916		
06:15	101		272		80		162		181		434			
06:30	208		328		160		180		368		508			
06:45	264		310		128		196		392		506			
07:00	227	1,056	175	555	114	726	124	452	341	1,782	299	1,007		
07:15	230		146		180		126		410		272			
07:30	275		136		224		108		499		244			
07:45	324		98		208		94		532		192			
08:00	288	971	84	365	170	640	102	435	458	1,611	186	800		
08:15	218		75		180		90		398		165			
08:30	250		94		153		122		403		216			
08:45	215		112		137		121		352		233			
09:00	186	734	77	322	137	610	144	550	323	1,344	221	872		
09:15	198		96		157		128		355		224			
09:30	184		73		158		170		342		243			
09:45	166		76		158		108		324		184			
10:00	181	593	69	189	180	529	84	191	361	1,122	153	380		
10:15	150		39		131		26		281		65			
10:30	146		45		120		58		266		103			
10:45	116		36		98		23		214		59			
11:00	176	731	21	55	118	710	16	39	294	1,441	37	94		
11:15	173		16		138		8		311		24			
11:30	196		10		202		7		398		17			
11:45	186		8		252		8		438		16			
Totals	5,069		8,180		3,861		6,821		8,930		15,001			
Split%	56.8		54.5		43.2		45.5							
Day Totals		13,249				10,682				23,931				
Day Splits		55.4				44.6								
Peak Hour	07:15		05:45		07:15		04:00		07:15		05:00			
Volume	1,117		1,226		782		878		1,899		2,005			
Factor	0.86		0.88		0.87		0.95		0.89		0.94			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : CHAPMAN AVENUE  
Segment : LEMON ST TO BERKELEY AVE  
Client : LL&G

Site: FULLERTON  
Date: 10/06/17

Interval	WB				EB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	30	112	248	920	27	109	180	719	57	221	428	1,639		
12:15	33		227		29		194		62		421			
12:30	31		215		30		171		61		386			
12:45	18		230		23		174		41		404			
01:00	9	63	238	883	16	91	174	720	25	154	412	1,603		
01:15	11		231		27		165		38		396			
01:30	22		210		25		177		47		387			
01:45	21		204		23		204		44		408			
02:00	12	45	196	916	32	82	194	781	44	127	390	1,697		
02:15	11		222		21		176		32		398			
02:30	18		234		13		205		31		439			
02:45	4		264		16		206		20		470			
03:00	9	36	252	1,170	8	32	252	926	17	68	504	2,096		
03:15	6		304		6		232		12		536			
03:30	12		292		9		252		21		544			
03:45	9		322		9		190		18		512			
04:00	11	53	300	1,212	6	66	184	876	17	119	484	2,088		
04:15	16		299		7		236		23		535			
04:30	12		321		32		228		44		549			
04:45	14		292		21		228		35		520			
05:00	29	148	372	1,307	20	159	229	875	49	307	601	2,182		
05:15	25		323		33		217		58		540			
05:30	46		288		43		215		89		503			
05:45	48		324		63		214		111		538			
06:00	62	494	316	1,103	66	511	188	734	128	1,005	504	1,837		
06:15	75		288		99		192		174		480			
06:30	152		251		186		194		338		445			
06:45	205		248		160		160		365		408			
07:00	161	760	202	710	130	772	156	597	291	1,532	358	1,307		
07:15	161		178		188		162		349		340			
07:30	196		166		207		138		403		304			
07:45	242		164		247		141		489		305			
08:00	264	871	137	500	146	733	150	520	410	1,604	287	1,020		
08:15	179		119		177		118		356		237			
08:30	212		128		204		126		416		254			
08:45	216		116		206		126		422		242			
09:00	174	659	122	518	169	610	112	512	343	1,269	234	1,030		
09:15	160		126		131		136		291		262			
09:30	142		146		146		124		288		270			
09:45	183		124		164		140		347		264			
10:00	188	700	104	451	144	624	120	409	332	1,324	224	860		
10:15	162		117		157		102		319		219			
10:30	146		118		166		100		312		218			
10:45	204		112		157		87		361		199			
11:00	198	865	114	372	168	668	84	324	366	1,533	198	696		
11:15	232		92		148		79		380		171			
11:30	215		96		156		98		371		194			
11:45	220		70		196		63		416		133			
Totals	4,806		10,062		4,457		7,993		9,263		18,055			
Split%	51.9		55.7		48.1		44.3							
Day Totals		14,868				12,450				27,318				
Day Splits		54.4				45.6								
Peak Hour	07:45		04:30		07:15		02:45		07:45		04:30			
Volume	897		1,308		788		942		1,671		2,210			
Factor	0.85		0.88		0.80		0.93		0.85		0.92			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : CHAPMAN AVENUE  
Segment : LEMON ST TO BERKELEY AVE  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	WB				EB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	58	181	218	904	46	188	188	764	104	369	406	1,668		
12:15	52		218		54		204		106		422			
12:30	40		224		44		186		84		410			
12:45	31		244		44		186		75		430			
01:00	38	138	208	838	36	165	211	757	74	303	419	1,595		
01:15	28		214		38		192		66		406			
01:30	32		192		38		182		70		374			
01:45	40		224		53		172		93		396			
02:00	29	102	210	791	36	135	203	727	65	237	413	1,518		
02:15	28		204		44		188		72		392			
02:30	22		196		38		168		60		364			
02:45	23		181		17		168		40		349			
03:00	19	58	181	723	18	66	175	671	37	124	356	1,394		
03:15	17		193		18		171		35		364			
03:30	6		158		17		162		23		320			
03:45	16		191		13		163		29		354			
04:00	9	40	158	661	6	52	149	635	15	92	307	1,296		
04:15	9		176		12		171		21		347			
04:30	8		160		14		125		22		285			
04:45	14		167		20		190		34		357			
05:00	10	57	137	627	13	68	166	584	23	125	303	1,211		
05:15	12		142		14		128		26		270			
05:30	17		176		18		136		35		312			
05:45	18		172		23		154		41		326			
06:00	26	140	170	671	22	187	124	520	48	327	294	1,191		
06:15	25		185		40		106		65		291			
06:30	38		172		47		149		85		321			
06:45	51		144		78		141		129		285			
07:00	55	363	130	522	80	337	132	502	135	700	262	1,024		
07:15	66		144		70		113		136		257			
07:30	102		126		72		119		174		245			
07:45	140		122		115		138		255		260			
08:00	95	520	96	417	112	538	122	398	207	1,058	218	815		
08:15	109		113		132		85		241		198			
08:30	136		110		118		95		254		205			
08:45	180		98		176		96		356		194			
09:00	138	626	114	422	152	573	118	397	290	1,199	232	819		
09:15	164		106		147		105		311		211			
09:30	156		98		140		92		296		190			
09:45	168		104		134		82		302		186			
10:00	216	731	114	443	136	607	90	330	352	1,338	204	773		
10:15	177		122		136		88		313		210			
10:30	170		108		181		70		351		178			
10:45	168		99		154		82		322		181			
11:00	182	792	104	316	162	748	84	268	344	1,540	188	584		
11:15	198		72		194		70		392		142			
11:30	190		74		214		52		404		126			
11:45	222		66		178		62		400		128			
Totals	3,748		7,335		3,664		6,553		7,412		13,888			
Split%	50.6		52.8		49.4		47.2							
Day Totals		11,083				10,217				21,300				
Day Splits		52.0				48.0								
Peak Hour	11:00		12:00		11:00		12:15		11:00		12:15			
Volume	792		904		748		787		1,540		1,681			
Factor	0.89		0.93		0.87		0.93		0.95		0.98			



# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : CHAPMAN AVENUE  
Segment : LEMON ST TO BERKELEY AVE  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	WB				EB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	59	170	162	649	54	156	142	612	113	326	304	1,261		
12:15	45		159		42		152		87		311			
12:30	32		160		30		158		62		318			
12:45	34		168		30		160		64		328			
01:00	39	127	178	712	37	160	131	564	76	287	309	1,276		
01:15	37		178		37		136		74		314			
01:30	28		188		38		147		66		335			
01:45	23		168		48		150		71		318			
02:00	32	93	177	643	50	124	134	570	82	217	311	1,213		
02:15	25		160		33		170		58		330			
02:30	20		158		17		132		37		290			
02:45	16		148		24		134		40		282			
03:00	10	36	180	603	18	52	138	525	28	88	318	1,128		
03:15	16		138		12		132		28		270			
03:30	2		148		14		119		16		267			
03:45	8		137		8		136		16		273			
04:00	6	31	128	577	11	36	128	534	17	67	256	1,111		
04:15	10		132		7		131		17		263			
04:30	7		158		8		146		15		304			
04:45	8		159		10		129		18		288			
05:00	10	35	142	556	12	39	128	473	22	74	270	1,029		
05:15	8		142		6		120		14		262			
05:30	7		126		10		107		17		233			
05:45	10		146		11		118		21		264			
06:00	9	60	162	574	12	63	116	528	21	123	278	1,102		
06:15	8		138		14		150		22		288			
06:30	17		140		17		132		34		272			
06:45	26		134		20		130		46		264			
07:00	26	127	119	505	30	159	125	388	56	286	244	893		
07:15	31		130		41		104		72		234			
07:30	26		124		40		87		66		211			
07:45	44		132		48		72		92		204			
08:00	58	265	106	386	44	256	106	355	102	521	212	741		
08:15	53		100		54		89		107		189			
08:30	60		82		61		92		121		174			
08:45	94		98		97		68		191		166			
09:00	88	424	92	288	84	381	88	284	172	805	180	572		
09:15	106		74		83		66		189		140			
09:30	100		58		98		82		198		140			
09:45	130		64		116		48		246		112			
10:00	122	543	66	217	131	521	64	202	253	1,064	130	419		
10:15	147		58		124		45		271		103			
10:30	136		50		127		45		263		95			
10:45	138		43		139		48		277		91			
11:00	131	581	36	142	134	565	34	123	265	1,146	70	265		
11:15	156		42		138		34		294		76			
11:30	148		36		138		29		286		65			
11:45	146		28		155		26		301		54			
Totals	2,492		5,852		2,512		5,158		5,004		11,010			
Split%	49.8		53.2		50.2		46.8							
Day Totals		8,344				7,670				16,014				
Day Splits		52.1				47.9								
Peak Hour	11:00		12:45		11:00		12:00		11:00		01:30			
Volume	581		712		565		612		1,146		1,294			
Factor	0.93		0.95		0.91		0.96		0.95		0.97			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L

Tustin, CA. 92780

Location : CHAPMAN AVENUE  
Segment : LEMON ST TO BERKELEY AVE  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	WB				EB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	35	101	241	925	24	78	164	744	59	179	405	1,669		
12:15	30		205		22		196		52		401			
12:30	16		240		23		174		39		414			
12:45	20		239		9		210		29		449			
01:00	11	37	309	1,134	14	55	157	777	25	92	466	1,911		
01:15	10		293		21		204		31		497			
01:30	7		272		8		188		15		460			
01:45	9		260		12		228		21		488			
02:00	16	43	288	1,257	12	30	212	810	28	73	500	2,067		
02:15	10		290		7		193		17		483			
02:30	12		341		3		195		15		536			
02:45	5		338		8		210		13		548			
03:00	7	34	332	1,261	5	33	280	948	12	67	612	2,209		
03:15	8		274		7		245		15		519			
03:30	8		302		9		228		17		530			
03:45	11		353		12		195		23		548			
04:00	6	56	388	1,483	12	79	220	906	18	135	608	2,389		
04:15	14		405		13		214		27		619			
04:30	18		368		22		230		40		598			
04:45	18		322		32		242		50		564			
05:00	26	160	337	1,381	28	161	204	848	54	321	541	2,229		
05:15	34		328		35		204		69		532			
05:30	44		389		46		221		90		610			
05:45	56		327		52		219		108		546			
06:00	52	370	306	1,247	76	614	194	900	128	984	500	2,147		
06:15	68		311		100		216		168		527			
06:30	98		336		232		258		330		594			
06:45	152		294		206		232		358		526			
07:00	156	714	281	824	175	858	172	604	331	1,572	453	1,428		
07:15	166		208		215		152		381		360			
07:30	170		187		228		134		398		321			
07:45	222		148		240		146		462		294			
08:00	164	676	138	516	232	802	130	503	396	1,478	268	1,019		
08:15	189		128		192		126		381		254			
08:30	166		128		194		126		360		254			
08:45	157		122		184		121		341		243			
09:00	192	786	128	484	170	712	130	441	362	1,498	258	925		
09:15	192		129		168		100		360		229			
09:30	202		100		182		119		384		219			
09:45	200		127		192		92		392		219			
10:00	220	708	124	290	180	651	84	239	400	1,359	208	529		
10:15	164		68		142		56		306		124			
10:30	158		51		161		52		319		103			
10:45	166		47		168		47		334		94			
11:00	211	1,045	44	144	172	726	53	149	383	1,771	97	293		
11:15	222		43		150		32		372		75			
11:30	322		27		200		32		522		59			
11:45	290		30		204		32		494		62			
Totals	4,730		10,946		4,799		7,869		9,529		18,815			
Split%	49.6		58.2		50.4		41.8							
Day Totals		15,676				12,668				28,344				
Day Splits		55.3				44.7								
Peak Hour	11:00		03:45		07:15		02:45		11:00		04:00			
Volume	1,045		1,514		915		963		1,771		2,389			
Factor	0.81		0.93		0.95		0.86		0.85		0.96			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : CHAPMAN AVENUE  
Segment : LEMON ST TO BERKELEY AVE  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	WB				EB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	17	59	207	922	38	93	176	749	55	152	383	1,671		
12:15	13		237		24		202		37		439			
12:30	15		262		17		166		32		428			
12:45	14		216		14		205		28		421			
01:00	14	39	283	1,033	17	49	199	779	31	88	482	1,812		
01:15	8		252		9		182		17		434			
01:30	10		246		12		202		22		448			
01:45	7		252		11		196		18		448			
02:00	3	25	269	1,126	8	42	216	806	11	67	485	1,932		
02:15	3		230		13		202		16		432			
02:30	11		288		10		184		21		472			
02:45	8		339		11		204		19		543			
03:00	2	27	298	1,179	3	25	262	936	5	52	560	2,115		
03:15	4		337		6		242		10		579			
03:30	10		236		13		210		23		446			
03:45	11		308		3		222		14		530			
04:00	8	56	320	1,249	12	79	232	872	20	135	552	2,121		
04:15	15		323		12		216		27		539			
04:30	13		314		24		218		37		532			
04:45	20		292		31		206		51		498			
05:00	27	163	310	1,293	23	150	248	958	50	313	558	2,251		
05:15	30		345		32		233		62		578			
05:30	44		338		33		247		77		585			
05:45	62		300		62		230		124		530			
06:00	77	583	301	1,200	71	583	238	939	148	1,166	539	2,139		
06:15	88		308		98		240		186		548			
06:30	184		292		217		244		401		536			
06:45	234		299		197		217		431		516			
07:00	230	877	266	826	174	899	184	638	404	1,776	450	1,464		
07:15	182		218		206		158		388		376			
07:30	218		180		232		144		450		324			
07:45	247		162		287		152		534		314			
08:00	266	885	154	597	220	824	140	564	486	1,709	294	1,161		
08:15	224		157		224		144		448		301			
08:30	204		134		189		132		393		266			
08:45	191		152		191		148		382		300			
09:00	189	809	148	605	164	723	156	549	353	1,532	304	1,154		
09:15	216		161		182		146		398		307			
09:30	196		160		201		146		397		306			
09:45	208		136		176		101		384		237			
10:00	280	827	120	313	194	657	98	290	474	1,484	218	603		
10:15	168		86		163		70		331		156			
10:30	205		60		166		76		371		136			
10:45	174		47		134		46		308		93			
11:00	206	965	48	160	164	710	49	155	370	1,675	97	315		
11:15	242		40		166		42		408		82			
11:30	301		35		200		32		501		67			
11:45	216		37		180		32		396		69			
Totals	5,315		10,503		4,834		8,235		10,149		18,738			
Split%	52.4		56.1		47.6		43.9							
Day Totals		15,818				13,069				28,887				
Day Splits		54.8				45.2								
Peak Hour	11:00		05:00		07:30		05:00		07:30		05:00			
Volume	965		1,293		963		958		1,918		2,251			
Factor	0.80		0.94		0.84		0.97		0.90		0.96			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/06/17

Interval	SB				NB				Combined				Day:	Friday
Begin	AM		PM		AM		PM		AM		PM			
12:00	3	22	138	398	6	18	67	261	9	40	205	659		
12:15	6		106		4		64		10		170			
12:30	9		98		6		68		15		166			
12:45	4		56		2		62		6		118			
01:00	7	16	71	271	5	15	66	224	12	31	137	495		
01:15	3		72		4		46		7		118			
01:30	3		64		4		52		7		116			
01:45	3		64		2		60		5		124			
02:00	2	11	64	300	6	12	60	269	8	23	124	569		
02:15	5		68		4		63		9		131			
02:30	2		76		1		62		3		138			
02:45	2		92		1		84		3		176			
03:00	0	6	117	349	0	8	71	364	0	14	188	713		
03:15	1		66		4		111		5		177			
03:30	3		80		2		92		5		172			
03:45	2		86		2		90		4		176			
04:00	4	25	96	359	3	17	84	350	7	42	180	709		
04:15	3		81		4		82		7		163			
04:30	9		100		2		102		11		202			
04:45	9		82		8		82		17		164			
05:00	9	43	140	348	7	53	82	375	16	96	222	723		
05:15	8		74		5		104		13		178			
05:30	14		68		21		102		35		170			
05:45	12		66		20		87		32		153			
06:00	12	141	43	219	10	133	79	279	22	274	122	498		
06:15	24		70		32		74		56		144			
06:30	59		55		43		68		102		123			
06:45	46		51		48		58		94		109			
07:00	56	303	48	146	61	347	44	167	117	650	92	313		
07:15	47		40		76		48		123		88			
07:30	84		26		86		46		170		72			
07:45	116		32		124		29		240		61			
08:00	104	323	27	124	118	398	22	94	222	721	49	218		
08:15	55		34		82		28		137		62			
08:30	86		28		111		22		197		50			
08:45	78		35		87		22		165		57			
09:00	56	212	20	113	66	252	34	102	122	464	54	215		
09:15	62		18		61		17		123		35			
09:30	46		38		65		24		111		62			
09:45	48		37		60		27		108		64			
10:00	53	207	17	65	46	184	13	67	99	391	30	132		
10:15	48		14		43		19		91		33			
10:30	63		18		53		18		116		36			
10:45	43		16		42		17		85		33			
11:00	57	305	13	48	58	220	18	47	115	525	31	95		
11:15	72		14		44		14		116		28			
11:30	88		12		53		10		141		22			
11:45	88		9		65		5		153		14			
Totals	1,614		2,740		1,657		2,599		3,271		5,339			
Split%	49.3		51.3		50.7		48.7							
Day Totals		4,354				4,256				8,610				
Day Splits		50.6				49.4								
Peak Hour	07:45		04:15		07:45		03:15		07:45		04:30			
Volume	361		403		435		377		796		766			
Factor	0.78		0.72		0.88		0.85		0.83		0.86			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/07/17

Interval	SB				NB				Combined				Day:	Saturday
Begin	AM		PM		AM		PM		AM		PM			
12:00	8	24	76	277	8	18	50	199	16	42	126	476		
12:15	4		63		4		52		8		115			
12:30	6		68		2		41		8		109			
12:45	6		70		4		56		10		126			
01:00	7	21	94	293	2	15	58	231	9	36	152	524		
01:15	4		81		1		58		5		139			
01:30	7		45		8		67		15		112			
01:45	3		73		4		48		7		121			
02:00	9	15	55	201	6	21	46	179	15	36	101	380		
02:15	2		60		7		40		9		100			
02:30	2		36		2		48		4		84			
02:45	2		50		6		45		8		95			
03:00	3	7	43	191	4	9	52	161	7	16	95	352		
03:15	2		50		2		42		4		92			
03:30	2		66		0		33		2		99			
03:45	0		32		3		34		3		66			
04:00	2	6	32	163	3	9	24	125	5	15	56	288		
04:15	1		49		0		28		1		77			
04:30	2		42		4		39		6		81			
04:45	1		40		2		34		3		74			
05:00	2	15	28	165	4	20	32	144	6	35	60	309		
05:15	4		47		4		46		8		93			
05:30	6		56		4		24		10		80			
05:45	3		34		8		42		11		76			
06:00	8	45	29	119	6	57	36	127	14	102	65	246		
06:15	7		34		6		34		13		68			
06:30	8		36		15		28		23		64			
06:45	22		20		30		29		52		49			
07:00	8	104	32	96	21	181	28	104	29	285	60	200		
07:15	26		28		24		28		50		56			
07:30	30		19		49		20		79		39			
07:45	40		17		87		28		127		45			
08:00	36	179	24	85	56	247	19	67	92	426	43	152		
08:15	42		28		38		22		80		50			
08:30	44		19		72		15		116		34			
08:45	57		14		81		11		138		25			
09:00	53	246	22	70	70	220	19	75	123	466	41	145		
09:15	55		16		48		16		103		32			
09:30	56		16		46		16		102		32			
09:45	82		16		56		24		138		40			
10:00	54	284	20	59	61	221	24	79	115	505	44	138		
10:15	65		19		56		24		121		43			
10:30	86		15		52		15		138		30			
10:45	79		5		52		16		131		21			
11:00	64	270	11	42	47	207	12	49	111	477	23	91		
11:15	78		10		40		7		118		17			
11:30	76		9		56		12		132		21			
11:45	52		12		64		18		116		30			
Totals	1,216		1,761		1,225		1,540		2,441		3,301			
Split%	49.8		53.3		50.2		46.7							
Day Totals		2,977				2,765				5,742				
Day Splits		51.8				48.2								
Peak Hour	10:30		12:30		08:30		12:45		09:45		12:45			
Volume	307		313		271		239		512		529			
Factor	0.89		0.83		0.84		0.89		0.93		0.87			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/08/17

Interval	SB				NB				Combined				Day:	Sunday
Begin	AM		PM		AM		PM		AM		PM			
12:00	7	23	32	144	11	30	50	163	18	53	82	307		
12:15	3		36		8		40		11		76			
12:30	11		38		7		33		18		71			
12:45	2		38		4		40		6		78			
01:00	3	12	44	168	3	21	40	147	6	33	84	315		
01:15	1		50		5		32		6		82			
01:30	4		46		7		34		11		80			
01:45	4		28		6		41		10		69			
02:00	0	11	38	149	3	14	37	138	3	25	75	287		
02:15	5		30		7		32		12		62			
02:30	3		36		3		34		6		70			
02:45	3		45		1		35		4		80			
03:00	3	8	34	131	3	8	38	113	6	16	72	244		
03:15	3		39		1		23		4		62			
03:30	1		28		4		22		5		50			
03:45	1		30		0		30		1		60			
04:00	2	4	30	123	2	9	32	123	4	13	62	246		
04:15	1		23		2		30		3		53			
04:30	1		40		3		28		4		68			
04:45	0		30		2		33		2		63			
05:00	1	11	27	112	4	16	35	152	5	27	62	264		
05:15	3		29		2		33		5		62			
05:30	5		24		6		44		11		68			
05:45	2		32		4		40		6		72			
06:00	8	26	35	118	5	24	29	122	13	50	64	240		
06:15	3		25		5		30		8		55			
06:30	7		32		4		30		11		62			
06:45	8		26		10		33		18		59			
07:00	10	54	22	94	14	60	29	107	24	114	51	201		
07:15	7		24		15		34		22		58			
07:30	14		24		12		25		26		49			
07:45	23		24		19		19		42		43			
08:00	13	75	27	72	10	60	16	70	23	135	43	142		
08:15	16		17		12		23		28		40			
08:30	22		12		16		17		38		29			
08:45	24		16		22		14		46		30			
09:00	18	103	12	51	20	101	16	61	38	204	28	112		
09:15	31		14		34		21		65		35			
09:30	28		8		21		12		49		20			
09:45	26		17		26		12		52		29			
10:00	24	115	14	35	29	124	11	38	53	239	25	73		
10:15	27		10		22		8		49		18			
10:30	26		8		33		12		59		20			
10:45	38		3		40		7		78		10			
11:00	39	146	8	21	32	132	5	18	71	278	13	39		
11:15	32		4		36		4		68		8			
11:30	37		6		30		5		67		11			
11:45	38		3		34		4		72		7			
Totals	588		1,218		599		1,252		1,187		2,470			
Split%	49.5		49.3		50.5		50.7							
Day Totals		1,806				1,851				3,657				
Day Splits		49.4				50.6								
Peak Hour	10:45		12:45		10:30		12:00		10:45		12:45			
Volume	146		178		141		163		284		324			
Factor	0.94		0.89		0.88		0.81		0.91		0.96			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/09/17

Interval	SB				NB				Combined				Day:	Monday
Begin	AM		PM		AM		PM		AM		PM			
12:00	5	15	114	454	7	20	88	322	12	35	202	776		
12:15	7		92		3		72		10		164			
12:30	0		118		8		68		8		186			
12:45	3		130		2		94		5		224			
01:00	3	12	142	524	6	16	114	441	9	28	256	965		
01:15	4		162		3		89		7		251			
01:30	3		92		4		140		7		232			
01:45	2		128		3		98		5		226			
02:00	1	5	125	543	0	5	88	430	1	10	213	973		
02:15	1		118		1		100		2		218			
02:30	2		142		3		110		5		252			
02:45	1		158		1		132		2		290			
03:00	1	4	124	400	0	10	130	611	1	14	254	1,011		
03:15	1		90		2		192		3		282			
03:30	1		100		5		140		6		240			
03:45	1		86		3		149		4		235			
04:00	2	16	110	487	5	11	130	547	7	27	240	1,034		
04:15	2		114		0		143		2		257			
04:30	6		149		0		140		6		289			
04:45	6		114		6		134		12		248			
05:00	10	47	114	448	8	68	116	526	18	115	230	974		
05:15	14		140		6		132		20		272			
05:30	7		98		26		142		33		240			
05:45	16		96		28		136		44		232			
06:00	13	141	80	424	22	312	132	564	35	453	212	988		
06:15	19		120		40		162		59		282			
06:30	38		142		89		140		127		282			
06:45	71		82		161		130		232		212			
07:00	66	300	72	246	118	470	58	206	184	770	130	452		
07:15	69		71		108		62		177		133			
07:30	72		55		120		38		192		93			
07:45	93		48		124		48		217		96			
08:00	88	365	54	251	126	407	46	122	214	772	100	373		
08:15	131		65		98		28		229		93			
08:30	80		64		89		26		169		90			
08:45	66		68		94		22		160		90			
09:00	91	419	62	264	112	398	17	98	203	817	79	362		
09:15	104		66		96		24		200		90			
09:30	96		68		80		23		176		91			
09:45	128		68		110		34		238		102			
10:00	166	384	41	87	88	284	16	52	254	668	57	139		
10:15	75		21		70		18		145		39			
10:30	83		16		65		10		148		26			
10:45	60		9		61		8		121		17			
11:00	79	549	15	39	62	371	11	22	141	920	26	61		
11:15	110		5		112		4		222		9			
11:30	216		6		111		3		327		9			
11:45	144		13		86		4		230		17			
Totals	2,257		4,167		2,372		3,941		4,629		8,108			
Split%	48.8		51.4		51.2		48.6							
Day Totals		6,424				6,313				12,737				
Day Splits		50.4				49.6								
Peak Hour	11:00		12:30		06:45		03:00		11:00		02:30			
Volume	549		552		507		611		920		1,078			
Factor	0.64		0.85		0.79		0.80		0.70		0.93			

# Transportation Studies, Inc.

2640 Walnut Avenue, Suite L  
Tustin, CA. 92780

Location : N. BERKELEY AVENUE  
Segment : N/O CHAPMAN AVENUE  
Client : LL&G

Site: FULLERTON  
Date: 10/10/17

Interval	SB				NB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	5	17	117	449	7	15	202	480	12	32	319	929		
12:15	3		102		3		92		6		194			
12:30	8		122		4		98		12		220			
12:45	1		108		1		88		2		196			
01:00	2	14	163	569	1	5	100	375	3	19	263	944		
01:15	3		150		0		86		3		236			
01:30	7		108		2		84		9		192			
01:45	2		148		2		105		4		253			
02:00	2	3	123	533	0	6	72	359	2	9	195	892		
02:15	0		104		1		81		1		185			
02:30	0		99		2		102		2		201			
02:45	1		207		3		104		4		311			
03:00	0	4	166	529	2	10	105	413	2	14	271	942		
03:15	1		128		1		124		2		252			
03:30	3		105		4		82		7		187			
03:45	0		130		3		102		3		232			
04:00	3	16	116	528	5	17	106	444	8	33	222	972		
04:15	1		134		3		104		4		238			
04:30	6		150		2		120		8		270			
04:45	6		128		7		114		13		242			
05:00	9	48	170	568	10	77	107	439	19	125	277	1,007		
05:15	7		167		8		106		15		273			
05:30	18		107		20		118		38		225			
05:45	14		124		39		108		53		232			
06:00	26	177	132	588	35	319	110	469	61	496	242	1,057		
06:15	22		164		54		99		76		263			
06:30	61		166		79		138		140		304			
06:45	68		126		151		122		219		248			
07:00	81	370	87	333	122	491	62	214	203	861	149	547		
07:15	80		86		100		65		180		151			
07:30	95		88		123		47		218		135			
07:45	114		72		146		40		260		112			
08:00	124	491	64	279	142	514	34	137	266	1,005	98	416		
08:15	121		52		150		30		271		82			
08:30	134		81		128		42		262		123			
08:45	112		82		94		31		206		113			
09:00	88	401	102	354	103	372	26	102	191	773	128	456		
09:15	106		72		85		29		191		101			
09:30	95		97		78		25		173		122			
09:45	112		83		106		22		218		105			
10:00	136	399	52	111	98	322	25	59	234	721	77	170		
10:15	113		25		80		12		193		37			
10:30	86		20		77		12		163		32			
10:45	64		14		67		10		131		24			
11:00	90	557	16	35	80	364	6	23	170	921	22	58		
11:15	118		12		94		8		212		20			
11:30	197		0		114		4		311		4			
11:45	152		7		76		5		228		12			
Totals	2,497		4,876		2,512		3,514		5,009		8,390			
Split%	49.9		58.1		50.1		41.9							
Day Totals		7,373				6,026				13,399				
Day Splits		55.0				45.0								
Peak Hour	11:00		04:30		07:45		12:00		07:45		04:30			
Volume	557		615		566		480		1,059		1,062			
Factor	0.71		0.90		0.94		0.59		0.98		0.96			



## APPENDIX B

### EXISTING TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

*APPENDIX B-1*





**EXISTING WEEKDAY PM PEAK HOUR  
TRAFFIC CONDITIONS**

### Intersection Level Of Service Report

#### Intersection 1: Harbor Boulevard at Bastanchury Road

Control Type:	Signalized	Delay (sec / veh):	57.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	296	1280	212	333	976	391	281	1255	171	191	1119	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	296	1280	212	333	976	391	281	1255	171	191	1119	330
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	320	53	83	244	98	70	314	43	48	280	83
Total Analysis Volume [veh/h]	296	1280	212	333	976	391	281	1255	171	191	1119	330
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	42	0	11	38	0	15	45	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	46	46	7	42	42	11	33	33	8	30	30
g / C, Green / Cycle	0.10	0.42	0.42	0.06	0.38	0.38	0.10	0.30	0.30	0.07	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.12	0.10	0.25	0.24	0.16	0.25	0.26	0.05	0.20	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	354	2376	750	228	1447	686	182	1139	539	256	1548	489
d1, Uniform Delay [s]	48.63	24.16	21.24	51.51	28.07	27.68	49.53	36.09	36.63	50.07	36.37	35.80
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.14	0.11	0.25	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.23	0.88	0.94	212.44	2.27	4.22	251.92	1.73	9.76	4.30	0.65	1.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.54	0.28	1.46	0.65	0.62	1.54	0.84	0.87	0.75	0.72	0.67
d, Delay for Lane Group [s/veh]	53.86	25.04	22.18	263.96	30.34	31.91	301.45	37.81	46.39	54.37	37.03	37.53
Lane Group LOS	D	C	C	F	C	C	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.24	8.40	3.78	9.87	10.46	9.76	17.73	12.08	13.31	2.73	9.09	8.07
50th-Percentile Queue Length [ft/ln]	105.95	209.97	94.49	246.65	261.61	244.09	443.27	301.95	332.81	68.18	227.35	201.81
95th-Percentile Queue Length [veh/ln]	7.61	13.15	6.80	16.64	15.77	14.89	28.36	17.78	19.30	4.91	14.04	12.73
95th-Percentile Queue Length [ft/ln]	190.36	328.79	170.09	416.00	394.24	372.21	708.90	444.44	482.40	122.73	350.99	318.30

**Movement, Approach, & Intersection Results**

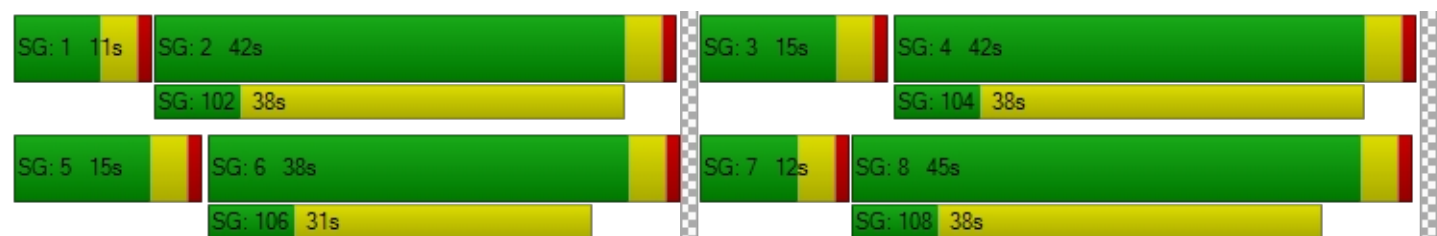
d_M, Delay for Movement [s/veh]	53.86	25.04	22.18	263.96	30.40	31.91	301.45	39.87	46.39	54.37	37.03	37.53
Movement LOS	D	C	C	F	C	C	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	29.47			76.50			83.58			39.15		
Approach LOS	C			E			F			D		
d_I, Intersection Delay [s/veh]	57.00											
Intersection LOS	E											
Intersection V/C	0.801											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.197			3.173			3.093			3.231		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			745			691		
d_b, Bicycle Delay [s]	23.56			26.25			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.543			2.495			2.498			2.462		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	27	1414	609	97	1238	68	102	191	36	550	114	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1414	609	97	1238	68	102	191	36	550	114	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	354	152	24	310	17	26	48	9	138	29	0
Total Analysis Volume [veh/h]	27	1414	609	97	1238	68	102	191	36	550	114	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	11	33	0	0	16	0	0	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	50	7	54	54	14	14	14	23	23
g / C, Green / Cycle	0.03	0.45	0.06	0.49	0.49	0.12	0.12	0.12	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.05	0.28	0.14	0.06	0.10	0.02	0.18	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	57	2587	116	1849	876	222	234	222	384	384
d1, Uniform Delay [s]	52.40	21.84	50.93	20.09	16.86	44.85	47.03	43.17	41.73	41.87
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.98	0.84	14.39	1.29	0.82	1.48	6.76	0.34	5.69	6.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.55	0.84	0.57	0.29	0.46	0.81	0.16	0.86	0.87
d, Delay for Lane Group [s/veh]	58.38	22.67	65.33	21.38	17.68	46.33	53.79	43.51	47.42	48.10
Lane Group LOS	E	C	E	C	B	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.83	8.84	3.10	9.67	3.92	2.68	5.52	0.90	9.15	9.36
50th-Percentile Queue Length [ft/ln]	20.69	221.00	77.53	241.68	98.00	66.95	138.00	22.49	228.83	234.03
95th-Percentile Queue Length [veh/ln]	1.49	13.72	5.58	14.77	7.06	4.82	9.37	1.62	14.11	14.38
95th-Percentile Queue Length [ft/ln]	37.24	342.90	139.55	369.16	176.41	120.51	234.33	40.49	352.87	359.47

**Movement, Approach, & Intersection Results**

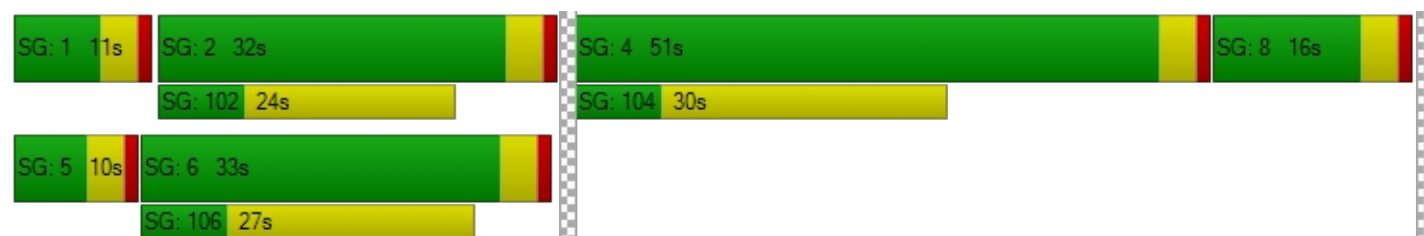
d_M, Delay for Movement [s/veh]	58.38	22.67	0.00	65.33	20.83	17.68	46.33	53.79	43.51	47.69	48.10	0.00
Movement LOS	E	C		E	C	B	D	D	D	D	D	
d_A, Approach Delay [s/veh]	23.34			23.76			50.35			47.76		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.04											
Intersection LOS	C											
Intersection V/C	0.688											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.010	2.272	2.259
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	509	527	218	855
d_b, Bicycle Delay [s]	30.56	29.82	43.65	18.04
I_b,int, Bicycle LOS Score for Intersection	2.352	2.331	2.102	2.655
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.881

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	81	1377	30	425	1314	37	40	192	127	61	261	607
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	1377	30	425	1314	37	40	192	127	61	261	607
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	344	8	106	329	9	10	48	32	15	65	152
Total Analysis Volume [veh/h]	81	1377	30	425	1314	37	40	192	127	61	261	607
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	50	50	16	60	60	32	32	32	32	32	52
g / C, Green / Cycle	0.06	0.45	0.45	0.15	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.47
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.38	0.12	0.35	0.02	0.02	0.10	0.07	0.03	0.14	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	863	818	513	2070	980	347	551	522	407	551	851
d1, Uniform Delay [s]	51.27	26.46	26.37	45.57	17.42	11.64	28.34	30.82	29.81	28.68	32.12	23.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.42	9.62	9.82	3.51	1.50	0.07	0.15	0.38	0.24	0.17	0.63	5.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.80	0.84	0.83	0.83	0.63	0.04	0.12	0.35	0.24	0.15	0.47	0.71
d, Delay for Lane Group [s/veh]	64.69	36.07	36.19	49.08	18.92	11.71	28.48	31.20	30.05	28.85	32.75	28.09
Lane Group LOS	E	D	D	D	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.58	18.45	17.39	5.86	11.50	0.44	0.78	4.07	2.60	1.21	5.78	13.30
50th-Percentile Queue Length [ft/ln]	64.50	461.25	434.70	146.55	287.43	10.90	19.56	101.74	65.03	30.13	144.51	332.42
95th-Percentile Queue Length [veh/ln]	4.64	25.49	24.23	9.83	17.06	0.78	1.41	7.33	4.68	2.17	9.72	19.28
95th-Percentile Queue Length [ft/ln]	116.10	637.36	605.67	245.82	426.45	19.61	35.21	183.13	117.06	54.23	243.08	481.92

**Movement, Approach, & Intersection Results**

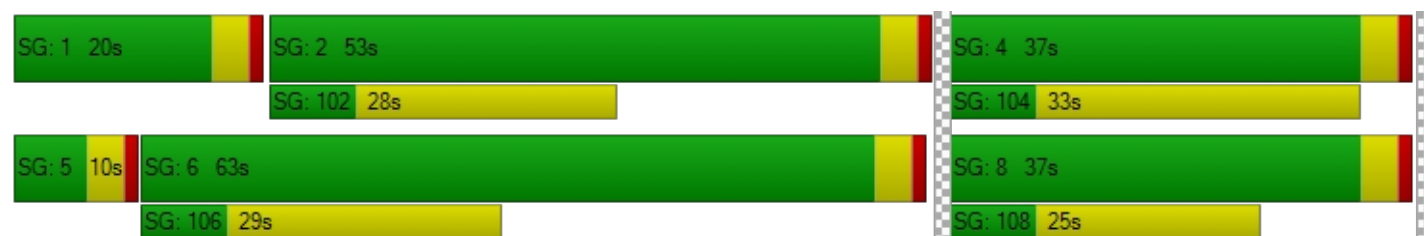
d_M, Delay for Movement [s/veh]	64.69	36.13	36.19	49.08	18.92	11.71	28.48	31.20	30.05	28.85	32.75	28.09
Movement LOS	E	D	D	D	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	37.68			25.99			30.49			29.45		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	30.87											
Intersection LOS	C											
Intersection V/C	0.881											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.979			3.190			2.321			2.617		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.787			3.025			2.152			3.092		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	38.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	446	426	118	115	296	19	23	344	289	81	490	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	446	426	118	115	296	19	23	344	289	81	490	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	107	30	29	74	5	6	86	72	20	123	36
Total Analysis Volume [veh/h]	446	426	118	115	296	19	23	344	289	81	490	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	43	0	0	32	0	0	35	35	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	38	38	38	38	23	23	64	23	23	23
g / C, Green / Cycle	0.34	0.34	0.34	0.34	0.34	0.20	0.20	0.58	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.24	0.24	0.07	0.06	0.18	0.01	0.18	0.16	0.05	0.18	0.16
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	617	617	617	617	617	106	389	1052	98	389	369
d1, Uniform Delay [s]	31.27	31.27	25.36	25.32	28.73	35.13	42.35	11.30	36.32	42.20	41.53
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.20	0.50	0.11	0.18	0.15
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.68	6.68	0.69	0.67	3.00	1.02	11.62	0.65	15.89	9.49	5.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.71	0.71	0.19	0.19	0.51	0.22	0.88	0.27	0.83	0.87	0.80
d, Delay for Lane Group [s/veh]	37.96	37.96	26.05	25.98	31.73	36.15	53.97	11.95	52.21	51.69	47.03
Lane Group LOS	D	D	C	C	C	D	D	B	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	11.03	11.03	2.29	2.22	7.07	0.53	10.24	3.56	2.25	9.83	8.16
50th-Percentile Queue Length [ft/ln]	275.63	275.63	57.16	55.59	176.76	13.20	255.95	89.11	56.13	245.69	203.98
95th-Percentile Queue Length [veh/ln]	16.47	16.47	4.12	4.00	11.43	0.95	15.49	6.42	4.04	14.97	12.84
95th-Percentile Queue Length [ft/ln]	411.76	411.76	102.88	100.07	285.78	23.76	387.14	160.40	101.04	374.22	321.09

**Movement, Approach, & Intersection Results**

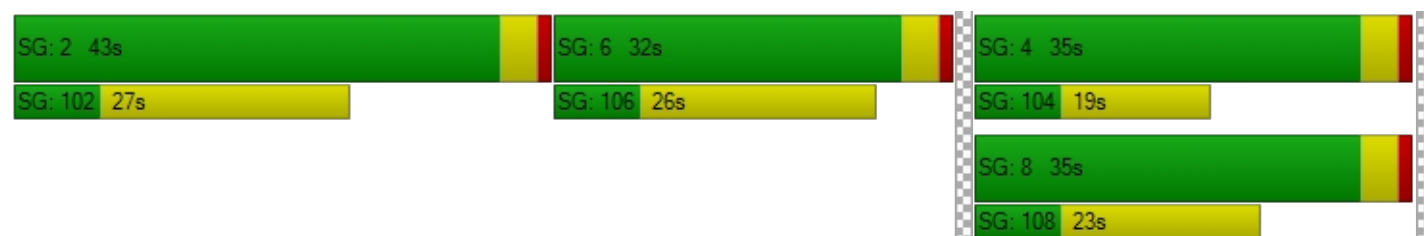
d_M, Delay for Movement [s/veh]	37.96	37.96	26.05	25.98	31.73	31.73	36.15	53.97	11.95	52.21	50.25	47.03
Movement LOS	D	D	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	36.54			30.19			34.83			49.82		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	38.56											
Intersection LOS	D											
Intersection V/C	0.672											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.660			2.315			2.624			2.456		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			509			564			564		
d_b, Bicycle Delay [s]	22.91			30.56			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	3.193			2.269			2.642			2.150		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.401

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	28	233	177	402	461	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	233	177	402	461	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	58	44	101	115	6
Total Analysis Volume [veh/h]	28	233	177	402	461	23
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	46	46	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	85	85	85	85
g / C, Green / Cycle	0.15	0.15	0.78	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.10	0.21	0.24	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	269	269	1284	1477	1477	1399
d1, Uniform Delay [s]	40.27	45.54	3.01	3.45	3.59	2.75
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	8.14	0.22	0.46	0.55	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.86	0.14	0.27	0.31	0.02
d, Delay for Lane Group [s/veh]	40.44	53.68	3.24	3.90	4.14	2.77
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.67	6.78	0.85	2.19	2.61	0.10
50th-Percentile Queue Length [ft/ln]	16.70	169.41	21.24	54.65	65.33	2.49
95th-Percentile Queue Length [veh/ln]	1.20	11.05	1.53	3.93	4.70	0.18
95th-Percentile Queue Length [ft/ln]	30.06	276.14	38.23	98.37	117.59	4.49

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	40.44	53.68	3.24	3.90	4.14	2.77
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	52.26		3.70		4.08	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.41					
Intersection LOS	B					
Intersection V/C	0.401					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.351	2.363	2.247
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.088	4.931
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 64s

SG: 4 46s

SG: 101 26s

SG: 104 21s




SG: 8 46s

### Intersection Level Of Service Report

#### Intersection 6: Euclid Street at Malvern Avenue

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.839

#### Intersection Setup

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	189	1235	99	137	1113	29	52	594	175	158	806	235
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	1235	99	137	1113	29	52	594	175	158	806	235
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	309	25	34	278	7	13	149	44	40	202	59
Total Analysis Volume [veh/h]	189	1235	99	137	1113	29	52	594	175	158	806	235
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	47	47	45	35	35	45	36	36
g / C, Green / Cycle	0.52	0.43	0.43	0.52	0.43	0.43	0.41	0.31	0.31	0.41	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.36	0.36	0.08	0.31	0.31	0.03	0.22	0.20	0.09	0.29	0.27
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	561	815	772	434	815	772	329	599	567	489	620	587
d1, Uniform Delay [s]	14.14	28.23	27.94	13.70	26.02	25.93	19.95	32.93	32.25	21.23	35.31	34.25
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.14	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.62	10.68	10.23	0.41	5.51	5.65	0.22	1.40	1.17	0.38	6.27	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.85	0.83	0.32	0.72	0.72	0.16	0.69	0.63	0.32	0.90	0.83
d, Delay for Lane Group [s/veh]	15.76	38.90	38.16	14.11	31.53	31.57	20.17	34.33	33.42	21.61	41.58	37.42
Lane Group LOS	B	D	D	B	C	C	C	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.73	18.22	16.74	1.79	13.66	12.83	0.84	9.69	8.27	2.70	14.96	12.32
50th-Percentile Queue Length [ft/ln]	68.37	455.39	418.44	44.82	341.43	320.68	20.95	242.15	206.83	67.41	374.11	308.11
95th-Percentile Queue Length [veh/ln]	4.92	25.22	23.45	3.23	19.72	18.70	1.51	14.79	12.99	4.85	21.31	18.08
95th-Percentile Queue Length [ft/ln]	123.06	630.38	586.18	80.67	492.94	467.52	37.71	369.75	324.76	121.33	532.72	452.05

**Movement, Approach, & Intersection Results**

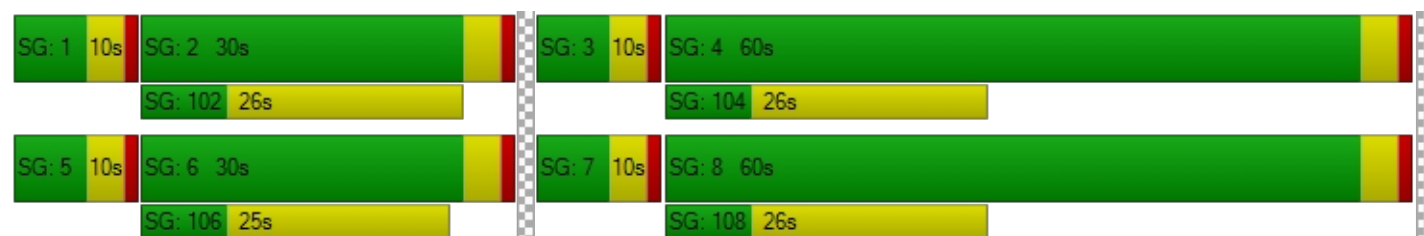
d_M, Delay for Movement [s/veh]	15.76	38.58	38.16	14.11	31.55	31.57	20.17	34.05	33.42	21.61	40.28	37.42
Movement LOS	B	D	D	B	C	C	C	C	C	C	D	D
d_A, Approach Delay [s/veh]	35.72			29.69			33.04			37.26		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.05											
Intersection LOS	C											
Intersection V/C	0.839											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.963			2.881			2.790			2.792		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.816			2.615			2.237			2.549		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 7: Harbor Boulevard at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	31.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.840

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	111	1066	114	121	904	106	244	691	102	198	1012	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1066	114	121	904	106	244	691	102	198	1012	154
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	267	29	30	226	27	61	173	26	50	253	39
Total Analysis Volume [veh/h]	111	1066	114	121	904	106	244	691	102	198	1012	154
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	10	56	0	13	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	58	48	48	58	48	48	44	31	31	44	34	34
g / C, Green / Cycle	0.53	0.44	0.44	0.53	0.44	0.44	0.40	0.28	0.28	0.40	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.32	0.31	0.07	0.28	0.27	0.14	0.22	0.21	0.11	0.27	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	642	829	785	545	830	786	368	536	508	458	1174	556
d1, Uniform Delay [s]	13.15	25.87	25.50	13.23	24.19	23.85	22.87	36.35	35.89	22.21	35.82	28.74
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	5.95	5.62	0.20	3.71	3.56	2.05	2.47	2.16	0.65	2.00	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.74	0.72	0.22	0.64	0.61	0.66	0.78	0.74	0.43	0.86	0.28
d, Delay for Lane Group [s/veh]	13.73	31.82	31.12	13.43	27.90	27.41	24.92	38.82	38.06	22.86	37.82	29.01
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.47	14.40	13.01	1.53	11.32	10.19	4.57	10.54	9.39	3.52	12.91	3.11
50th-Percentile Queue Length [ft/ln]	36.82	359.90	325.33	38.29	282.88	254.83	114.29	263.53	234.73	88.01	322.73	77.85
95th-Percentile Queue Length [veh/ln]	2.65	20.62	18.93	2.76	16.83	15.43	8.08	15.87	14.41	6.34	18.80	5.61
95th-Percentile Queue Length [ft/ln]	66.28	515.46	473.23	68.92	420.79	385.72	201.96	396.65	360.36	158.41	470.04	140.13

**Movement, Approach, & Intersection Results**

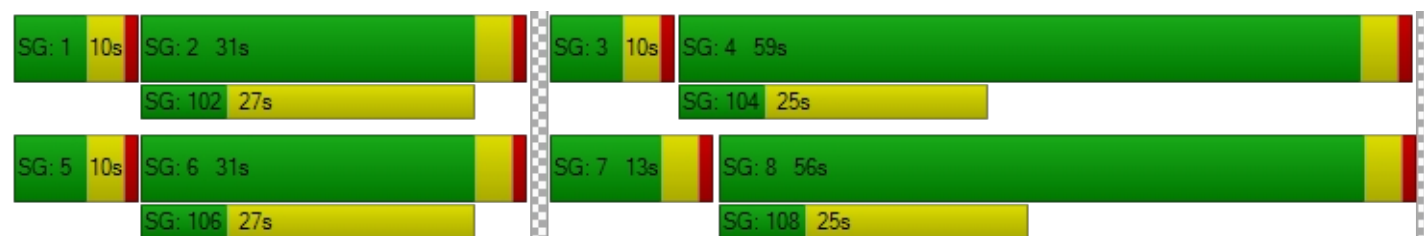
d_M, Delay for Movement [s/veh]	13.73	31.52	31.12	13.43	27.70	27.41	24.92	38.52	38.06	22.86	37.82	29.01
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	29.96			26.14			35.27			34.66		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	31.54											
Intersection LOS	C											
Intersection V/C	0.840											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.880			2.929			2.823			2.913		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			945			1000		
d_b, Bicycle Delay [s]	31.31			31.31			15.29			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.625			2.493			2.415			2.685		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	34.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	151	836	140	82	603	116	132	776	125	283	1140	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	836	140	82	603	116	132	776	125	283	1140	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	209	35	21	151	29	33	194	31	71	285	30
Total Analysis Volume [veh/h]	151	836	140	82	603	116	132	776	125	283	1140	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	34	0	10	29	0	14	51	0	15	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	41	41	51	40	40	10	36	36	11	37	37
g / C, Green / Cycle	0.46	0.38	0.38	0.46	0.36	0.36	0.09	0.33	0.33	0.10	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.08	0.05	0.20	0.19	0.07	0.25	0.24	0.08	0.30	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	637	1428	676	608	680	645	161	626	593	345	1286	609
d1, Uniform Delay [s]	17.32	27.50	23.26	16.63	28.34	27.95	49.25	32.98	32.45	48.68	34.41	25.81
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.15	0.13	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.88	1.76	0.69	0.10	3.28	3.06	9.80	2.71	2.05	4.89	2.26	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.24	0.59	0.21	0.13	0.56	0.53	0.82	0.76	0.72	0.82	0.89	0.20
d, Delay for Lane Group [s/veh]	18.20	29.27	23.96	16.73	31.62	31.02	59.05	35.68	34.50	53.57	36.67	25.97
Lane Group LOS	B	C	C	B	C	C	E	D	C	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.38	9.02	2.59	1.18	8.54	7.54	3.99	11.60	10.20	4.03	14.52	2.26
50th-Percentile Queue Length [ft/ln]	59.57	225.43	64.64	29.45	213.54	188.58	99.85	289.89	255.01	100.86	363.10	56.40
95th-Percentile Queue Length [veh/ln]	4.29	13.94	4.65	2.12	13.33	12.05	7.19	17.18	15.44	7.26	20.77	4.06
95th-Percentile Queue Length [ft/ln]	107.23	348.54	116.35	53.02	333.36	301.18	179.72	429.51	385.96	181.54	519.35	101.52

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	18.20	29.27	23.96	16.73	31.40	31.02	59.05	35.22	34.50	53.57	36.67	25.97
Movement LOS	B	C	C	B	C	C	E	D	C	D	D	C
d_A, Approach Delay [s/veh]	27.13			29.84			38.18			38.94		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.19											
Intersection LOS	C											
Intersection V/C	0.732											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.810			2.678			2.866			3.003		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			455			855			873		
d_b, Bicycle Delay [s]	29.09			32.84			18.04			17.47		
I_b,int, Bicycle LOS Score for Intersection	2.489			2.220			2.412			2.833		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.612

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	11	62	43	438	61	87	57	902	13	52	1425	432
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	62	43	438	61	87	57	902	13	52	1425	432
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	11	110	15	22	14	226	3	13	356	108
Total Analysis Volume [veh/h]	11	62	43	438	61	87	57	902	13	52	1425	432
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	18	28	74	74	74	65	65	87
g / C, Green / Cycle	0.05	0.05	0.05	0.16	0.25	0.68	0.68	0.68	0.59	0.59	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.02	0.13	0.08	0.03	0.25	0.25	0.03	0.38	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	101	96	570	455	859	1282	1215	898	2253	1426
d1, Uniform Delay [s]	49.61	50.97	50.51	44.08	33.50	6.01	7.74	7.73	9.39	14.59	3.13
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	5.83	3.23	2.22	0.41	0.03	0.81	0.85	0.12	1.36	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.61	0.45	0.77	0.33	0.07	0.37	0.37	0.06	0.63	0.30
d, Delay for Lane Group [s/veh]	50.78	56.80	53.75	46.30	33.91	6.04	8.55	8.58	9.51	15.95	3.25
Lane Group LOS	D	E	D	D	C	A	A	A	A	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.31	1.83	1.23	5.86	3.27	0.42	4.70	4.44	0.54	11.30	2.01
50th-Percentile Queue Length [ft/ln]	7.75	45.85	30.85	146.49	81.81	10.56	117.57	110.99	13.54	282.55	50.30
95th-Percentile Queue Length [veh/ln]	0.56	3.30	2.22	9.83	5.89	0.76	8.26	7.90	0.97	16.82	3.62
95th-Percentile Queue Length [ft/ln]	13.94	82.53	55.53	245.74	147.26	19.01	206.48	197.38	24.37	420.39	90.54

**Movement, Approach, & Intersection Results**

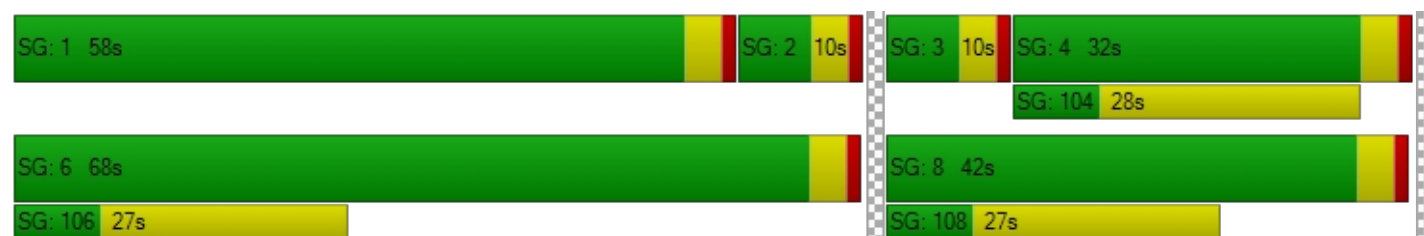
d_M, Delay for Movement [s/veh]	50.78	56.80	53.75	46.30	33.91	33.91	6.04	8.56	8.58	9.51	15.95	3.25
Movement LOS	D	E	D	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	55.10			43.17			8.42			12.90		
Approach LOS	E			D			A			B		
d_I, Intersection Delay [s/veh]	18.00											
Intersection LOS	B											
Intersection V/C	0.612											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.274			2.467			2.812			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.751			2.527			2.362			3.135		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	279	268	232	65	162	62	59	1081	134	189	1546	105
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	279	268	232	65	162	62	59	1081	134	189	1546	105
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	67	58	16	41	16	15	270	34	47	387	26
Total Analysis Volume [veh/h]	279	268	232	65	162	62	59	1081	134	189	1546	105
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	40	0	10	30	0	11	45	0	15	49	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	20	20	29	9	9	73	62	62	73	64	64
g / C, Green / Cycle	0.27	0.18	0.18	0.27	0.08	0.08	0.66	0.56	0.56	0.66	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.13	0.04	0.06	0.06	0.03	0.33	0.32	0.11	0.45	0.45
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	474	347	328	338	161	152	649	1067	1011	872	1098	1040
d1, Uniform Delay [s]	35.03	42.84	42.24	30.70	49.17	49.01	6.56	15.89	15.62	7.09	17.74	17.68
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.16	3.69	2.79	0.27	6.29	5.61	0.06	2.45	2.37	0.57	5.33	5.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.77	0.71	0.19	0.73	0.70	0.09	0.60	0.57	0.22	0.77	0.77
d, Delay for Lane Group [s/veh]	36.19	46.53	45.03	30.98	55.46	54.62	6.62	18.34	17.99	7.66	23.08	23.18
Lane Group LOS	D	D	D	C	E	D	A	B	B	A	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.61	7.25	6.14	1.34	3.44	3.07	0.47	10.73	9.64	1.72	16.99	16.02
50th-Percentile Queue Length [ft/ln]	165.16	181.33	153.57	33.59	85.90	76.73	11.68	268.13	241.05	42.94	424.79	400.60
95th-Percentile Queue Length [veh/ln]	10.82	11.67	10.21	2.42	6.18	5.52	0.84	16.10	14.73	3.09	23.75	22.59
95th-Percentile Queue Length [ft/ln]	270.54	291.75	255.18	60.47	154.62	138.11	21.02	402.40	368.36	77.29	593.80	564.72

**Movement, Approach, & Intersection Results**

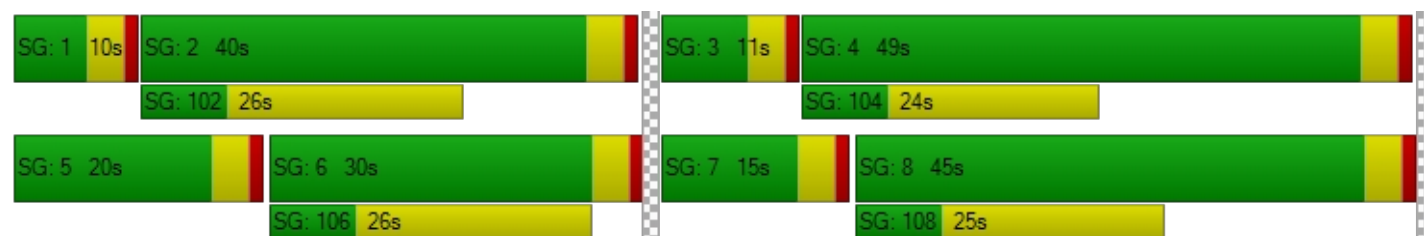
d_M, Delay for Movement [s/veh]	36.19	46.53	45.03	30.98	55.23	54.62	6.62	18.19	17.99	7.66	23.12	23.18
Movement LOS	D	D	D	C	E	D	A	B	B	A	C	C
d_A, Approach Delay [s/veh]	42.38			49.64			17.64			21.54		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	26.17											
Intersection LOS	C											
Intersection V/C	0.774											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.712			2.366			2.966			2.955		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			473			745			818		
d_b, Bicycle Delay [s]	24.89			32.07			21.64			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.845			1.798			2.611			3.078		
Bicycle LOS	C			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	88	242	205	55	118	72	48	1254	92	112	1515	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	242	205	55	118	72	48	1254	92	112	1515	53
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	61	51	14	30	18	12	314	23	28	379	13
Total Analysis Volume [veh/h]	88	242	205	55	118	72	48	1254	92	112	1515	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	63	0	0	63	0	24	37	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	85	75	75	85	76	76
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.77	0.68	0.68	0.77	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.11	0.03	0.11	0.03	0.37	0.36	0.06	0.42	0.42
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	131	291	275	89	275	1069	1300	1232	1145	1321	1251
d1, Uniform Delay [s]	41.48	45.21	44.52	40.69	44.11	2.88	8.66	8.56	2.99	8.89	8.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	6.16	3.98	6.84	3.08	0.02	1.59	1.61	0.17	2.12	2.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.67	0.83	0.74	0.62	0.69	0.04	0.54	0.53	0.10	0.61	0.61
d, Delay for Lane Group [s/veh]	47.32	51.36	48.50	47.53	47.18	2.90	10.26	10.18	3.16	11.01	11.06
Lane Group LOS	D	D	D	D	D	A	B	B	A	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.34	6.87	5.62	1.47	5.12	0.20	8.02	7.38	0.53	9.79	9.22
50th-Percentile Queue Length [ft/ln]	58.50	171.84	140.60	36.83	127.99	5.07	200.51	184.61	13.33	244.74	230.46
95th-Percentile Queue Length [veh/ln]	4.21	11.17	9.51	2.65	8.83	0.37	12.66	11.84	0.96	14.92	14.20
95th-Percentile Queue Length [ft/ln]	105.30	279.33	237.82	66.30	220.76	9.13	316.62	296.02	24.00	373.03	354.94

**Movement, Approach, & Intersection Results**

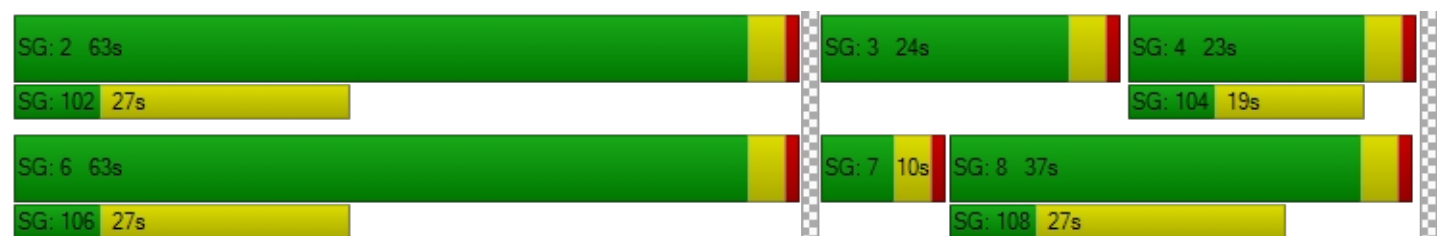
d_M, Delay for Movement [s/veh]	47.32	51.36	48.50	47.53	47.18	47.18	2.90	10.22	10.18	3.16	11.03	11.06
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	49.60			47.26			9.97			10.51		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	18.07											
Intersection LOS	B											
Intersection V/C	0.629											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.462			2.190			3.033			3.010		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1073			1073			600			345		
d_b, Bicycle Delay [s]	11.82			11.82			26.95			37.64		
I_b,int, Bicycle LOS Score for Intersection	2.442			1.964			2.710			2.946		
Bicycle LOS	B			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	81	402	68	312	387	543	439	869	50	124	1049	275
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	402	68	312	387	543	439	869	50	124	1049	275
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	101	17	78	97	136	110	217	13	31	262	69
Total Analysis Volume [veh/h]	81	402	68	312	387	543	439	869	50	124	1049	275
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	15	38	38	20	44	0	17	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	33	33	11	38	58	16	40	40	9	34	34
g / C, Green / Cycle	0.06	0.30	0.30	0.10	0.35	0.53	0.15	0.37	0.37	0.08	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.04	0.09	0.10	0.30	0.13	0.23	0.03	0.07	0.28	0.15
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	105	1153	546	352	1314	950	510	1388	658	154	1159	549
d1, Uniform Delay [s]	51.13	29.88	27.76	48.89	26.24	17.57	45.93	28.75	22.81	49.46	36.74	31.39
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.37	0.83	0.47	7.51	0.57	2.49	4.38	0.47	0.05	9.54	3.00	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.35	0.12	0.89	0.29	0.57	0.86	0.63	0.08	0.81	0.91	0.50
d, Delay for Lane Group [s/veh]	62.49	30.71	28.23	56.40	26.81	20.07	50.31	29.21	22.85	59.00	39.74	32.10
Lane Group LOS	E	C	C	E	C	C	D	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.53	4.27	1.37	4.58	3.79	9.63	6.14	9.39	0.86	3.75	13.78	6.07
50th-Percentile Queue Length [ft/ln]	63.23	106.77	34.30	114.59	94.74	240.86	153.54	234.67	21.44	93.70	344.56	151.67
95th-Percentile Queue Length [veh/ln]	4.55	7.66	2.47	8.09	6.82	14.72	10.21	14.41	1.54	6.75	19.87	10.11
95th-Percentile Queue Length [ft/ln]	113.81	191.50	61.73	202.37	170.54	368.12	255.15	360.29	38.59	168.66	496.77	252.65

**Movement, Approach, & Intersection Results**

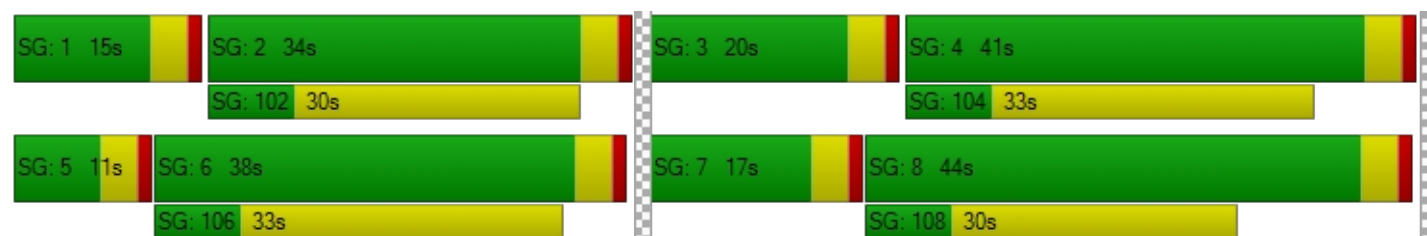
d_M, Delay for Movement [s/veh]	62.49	30.71	28.23	56.40	26.81	20.07	50.31	29.21	22.85	59.00	39.74	32.10
Movement LOS	E	C	C	E	C	C	D	C	C	E	D	C
d_A, Approach Delay [s/veh]	35.08			31.29			35.80			39.94		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	35.80											
Intersection LOS	D											
Intersection V/C	0.818											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.643			2.932			3.026			2.901		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			618			727			673		
d_b, Bicycle Delay [s]	29.09			26.25			22.27			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.014			2.584			2.680			2.754		
Bicycle LOS	B			B			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	30	44	52	0	254	130	52	388	0
Total Analysis Volume [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	69	0	0	31	0	10	41	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	63	63	15	81
g / C, Green / Cycle		0.19	0.19	0.57	0.57	0.13	0.74
(v / s)_i Volume / Saturation Flow Rate		0.16	0.11	0.27	0.29	0.11	0.41
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		338	338	2161	1024	241	2809
d1, Uniform Delay [s]		43.33	40.93	13.95	14.36	46.55	6.32
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.81	1.77	0.73	1.79	8.32	0.79
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.61	0.47	0.51	0.85	0.55
d, Delay for Lane Group [s/veh]		50.14	42.70	14.68	16.15	54.87	7.11
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.34	5.27	7.34	7.99	6.04	6.97
50th-Percentile Queue Length [ft/ln]		208.57	131.63	183.47	199.87	151.02	174.26
95th-Percentile Queue Length [veh/ln]		13.08	9.03	11.78	12.63	10.07	11.30
95th-Percentile Queue Length [ft/ln]		327.00	225.71	294.54	315.80	251.79	282.50

**Movement, Approach, & Intersection Results**

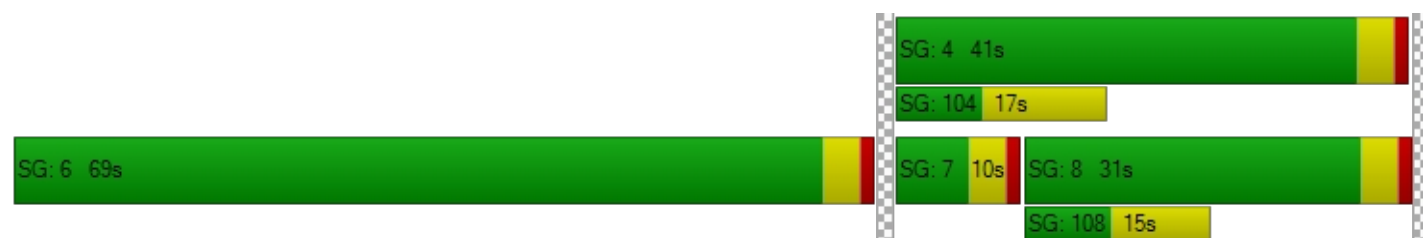
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	50.14	50.14	42.70	0.00	14.68	16.15	54.87	7.11	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			47.08			15.18			12.71		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.24											
Intersection LOS	B											
Intersection V/C	0.641											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.308	1.968	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1182	491	673
d_b, Bicycle Delay [s]	55.00	9.20	31.31	24.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.385	2.402	3.009
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.765

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	155	0	122	0	0	0	36	243	0	0	305	51
Total Analysis Volume [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	81	0	0	0	0	0	10	29	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.24	0.24	0.24		0.10	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.37	0.40
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	437	437	437		179	2600	1043	988
d1, Uniform Delay [s]	39.67	39.67	39.67		48.53	7.37	17.90	18.52
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.59	4.59	4.59		8.56	0.41	3.62	4.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.81	0.37	0.68	0.72
d, Delay for Lane Group [s/veh]	44.26	44.26	44.26		57.09	7.78	21.53	23.06
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.98	9.98	9.98		4.31	4.57	13.46	14.09
50th-Percentile Queue Length [ft/ln]	249.61	249.61	249.61		107.76	114.30	336.56	352.15
95th-Percentile Queue Length [veh/ln]	15.17	15.17	15.17		7.72	8.08	19.48	20.24
95th-Percentile Queue Length [ft/ln]	379.17	379.17	379.17		192.88	201.97	487.00	506.03

**Movement, Approach, & Intersection Results**

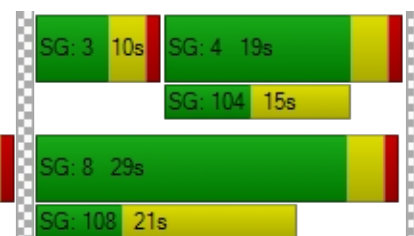
d_M, Delay for Movement [s/veh]	44.26	0.00	44.26	0.00	0.00	0.00	57.09	7.78	0.00	0.00	22.17	23.06
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.26			0.00			14.17			22.30		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.48											
Intersection LOS	C											
Intersection V/C	0.765											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	1.774	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	455	273
d_b, Bicycle Delay [s]	55.00	55.00	32.84	41.02
I_b,int, Bicycle LOS Score for Intersection	5.964	4.132	2.482	2.734
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 15: Lemon Street at Wilshire Avenue

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

#### Intersection Setup

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	46	1094	81	57	884	46	19	44	49	100	52	84
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	1094	81	57	884	46	19	44	49	100	52	84
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	274	20	14	221	12	5	11	12	25	13	21
Total Analysis Volume [veh/h]	46	1094	81	57	884	46	19	44	49	100	52	84
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.32	0.31	0.03	0.25	0.25	0.06	0.13
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1277	1478	1400	1223	1478	1400	307	316
d1, Uniform Delay [s]	2.78	3.99	3.95	2.80	3.63	3.61	42.31	45.66
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.85	0.87	0.07	0.59	0.60	0.72	3.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.41	0.40	0.05	0.33	0.32	0.36	0.75
d, Delay for Lane Group [s/veh]	2.83	4.85	4.82	2.87	4.22	4.21	43.03	49.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.20	3.87	3.56	0.25	2.77	2.57	2.81	6.57
50th-Percentile Queue Length [ft/ln]	5.08	96.69	88.92	6.37	69.16	64.26	70.37	164.28
95th-Percentile Queue Length [veh/ln]	0.37	6.96	6.40	0.46	4.98	4.63	5.07	10.78
95th-Percentile Queue Length [ft/ln]	9.15	174.05	160.05	11.46	124.48	115.67	126.67	269.39

**Movement, Approach, & Intersection Results**

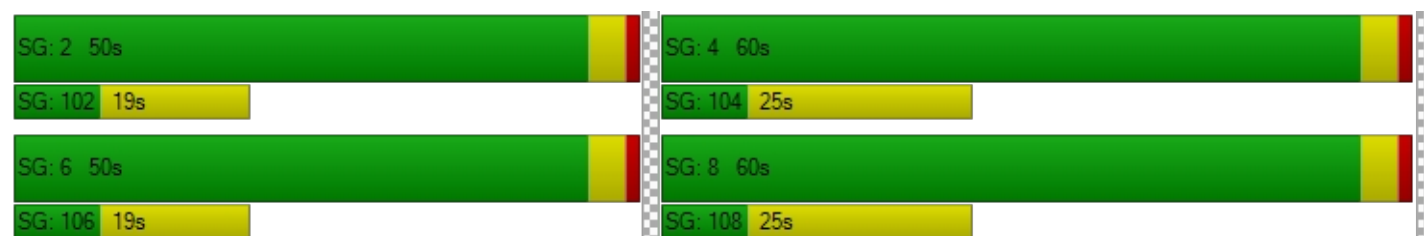
d_M, Delay for Movement [s/veh]	2.83	4.83	4.82	2.87	4.22	4.21	43.03	43.03	43.03	49.20	49.20	49.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.76			4.14			43.03			49.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.30											
Intersection LOS	B											
Intersection V/C	0.488											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.891			2.762			1.915			2.009		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.567			2.374			1.744			1.949		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	113	1053	197	48	1017	100	130	599	116	219	747	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	113	1053	197	48	1017	100	130	599	116	219	747	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	263	49	12	254	25	33	150	29	55	187	18
Total Analysis Volume [veh/h]	113	1053	197	48	1017	100	130	599	116	219	747	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	12	33	0	10	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	47	39	39	47	37	37	55	41	41	55	44	44
g / C, Green / Cycle	0.43	0.35	0.35	0.43	0.34	0.34	0.50	0.37	0.37	0.50	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.11	0.03	0.31	0.30	0.07	0.16	0.06	0.12	0.20	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	343	1333	631	418	643	609	722	1402	664	777	1526	723
d1, Uniform Delay [s]	19.08	32.10	26.06	18.38	34.75	34.29	14.99	26.02	23.43	15.84	24.53	20.51
k, delay calibration	0.11	0.11	0.11	0.11	0.20	0.18	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.55	1.09	0.28	0.12	8.85	6.94	0.12	0.95	0.57	0.91	1.12	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.33	0.79	0.31	0.11	0.91	0.88	0.18	0.43	0.17	0.28	0.49	0.10
d, Delay for Lane Group [s/veh]	19.64	33.19	26.34	18.50	43.60	41.23	15.11	26.98	24.00	16.74	25.66	20.77
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.81	12.56	3.80	0.73	16.15	14.37	1.77	6.01	2.14	3.30	7.39	1.17
50th-Percentile Queue Length [ft/ln]	45.20	313.95	95.05	18.30	403.67	359.25	44.26	150.22	53.41	82.60	184.66	29.34
95th-Percentile Queue Length [veh/ln]	3.25	18.37	6.84	1.32	22.74	20.59	3.19	10.03	3.85	5.95	11.84	2.11
95th-Percentile Queue Length [ft/ln]	81.36	459.25	171.10	32.94	568.42	514.67	79.67	250.73	96.14	148.68	296.09	52.80

**Movement, Approach, & Intersection Results**

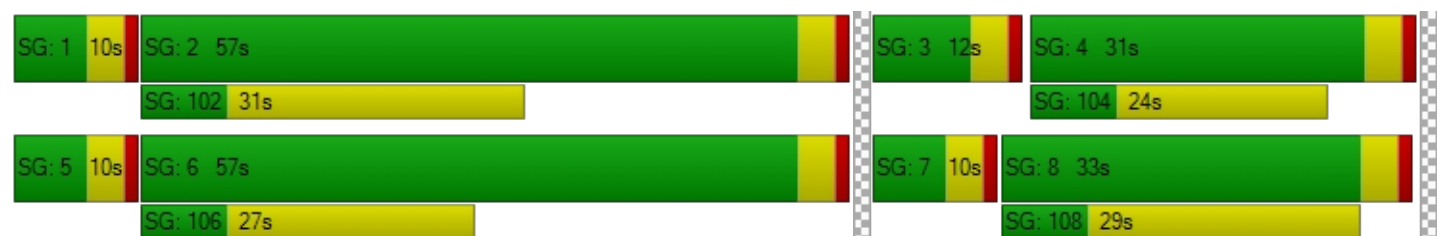
d_M, Delay for Movement [s/veh]	19.64	33.19	26.34	18.50	42.59	41.23	15.11	26.98	24.00	16.74	25.66	20.77
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	31.07			41.48			24.74			23.44		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.82											
Intersection LOS	C											
Intersection V/C	0.685											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.025			2.859			2.813			2.793		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			491		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.684			2.521			2.257			2.414		
Bicycle LOS	B			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	142	1001	212	46	804	91	117	642	97	353	821	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	142	1001	212	46	804	91	117	642	97	353	821	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	250	53	12	201	23	29	161	24	88	205	21
Total Analysis Volume [veh/h]	142	1001	212	46	804	91	117	642	97	353	821	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	36	0	34	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	34	34	42	32	32	9	42	42	14	47	47
g / C, Green / Cycle	0.38	0.31	0.31	0.38	0.29	0.29	0.08	0.38	0.38	0.12	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.08	0.26	0.12	0.03	0.25	0.24	0.07	0.17	0.05	0.10	0.22	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	378	1165	552	344	557	528	148	1448	686	438	1610	763
d1, Uniform Delay [s]	22.61	35.95	30.01	21.37	36.48	36.05	49.58	25.38	22.29	46.87	23.32	19.19
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.62	1.98	0.44	0.17	3.48	3.02	8.98	0.99	0.43	3.56	1.16	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.86	0.38	0.13	0.84	0.81	0.79	0.44	0.14	0.81	0.51	0.11
d, Delay for Lane Group [s/veh]	23.23	37.93	30.45	21.55	39.96	39.07	58.56	26.36	22.72	50.44	24.48	19.49
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.52	12.77	4.47	0.77	12.16	10.93	3.52	6.38	1.72	4.90	7.96	1.37
50th-Percentile Queue Length [ft/ln]	63.05	319.30	111.77	19.23	304.11	273.33	88.01	159.56	43.09	122.55	198.93	34.36
95th-Percentile Queue Length [veh/ln]	4.54	18.63	7.94	1.38	17.88	16.36	6.34	10.53	3.10	8.53	12.58	2.47
95th-Percentile Queue Length [ft/ln]	113.49	465.82	198.46	34.61	447.11	408.90	158.41	263.14	77.57	213.33	314.58	61.84

**Movement, Approach, & Intersection Results**

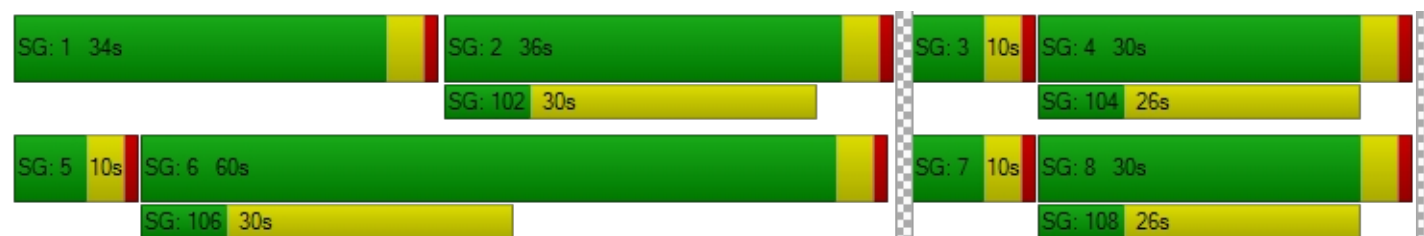
d_M, Delay for Movement [s/veh]	23.23	37.93	30.45	21.55	39.59	39.07	58.56	26.36	22.72	50.44	24.48	19.49
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	B
d_A, Approach Delay [s/veh]	35.22			38.66			30.35			31.42		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.92											
Intersection LOS	C											
Intersection V/C	0.681											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.886			2.727			2.836			2.925		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			1018			473			473		
d_b, Bicycle Delay [s]	27.65			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.677			2.336			2.266			2.598		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.986

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	59	1329	50	22	46	1386	60	114	86	67	132	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	1329	50	22	46	1386	60	114	86	67	132	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	332	13	6	12	347	15	29	22	17	33	4
Total Analysis Volume [veh/h]	59	1329	50	22	46	1386	60	114	86	67	132	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	88	0	0	88	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18	18
g / C, Green / Cycle	0.77	0.77	0.77	0.77	0.77	0.77	0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.37	0.01	0.02	0.77	0.14	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	72	1459	1382	1152	1459	1382	327	69	286
d1, Uniform Delay [s]	3.05	4.72	4.69	2.99	3.02	12.72	45.33	40.28	42.23
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	62.47	1.17	1.21	0.03	0.04	24.82	4.43	41.98	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.49	0.48	0.02	0.03	1.00	0.80	0.96	0.51
d, Delay for Lane Group [s/veh]	65.52	5.89	5.90	3.02	3.06	37.55	49.76	82.26	43.65
Lane Group LOS	E	A	A	A	A	F	D	F	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.51	5.26	4.92	0.10	0.21	34.59	7.32	2.39	3.76
50th-Percentile Queue Length [ft/ln]	37.83	131.42	123.08	2.58	5.36	864.66	182.96	59.85	93.91
95th-Percentile Queue Length [veh/ln]	2.72	9.02	8.56	0.19	0.39	44.34	11.76	4.31	6.76
95th-Percentile Queue Length [ft/ln]	68.09	225.43	214.05	4.65	9.65	1108.54	293.88	107.72	169.04

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	65.52	5.89	5.90	3.02	3.06	37.55	49.76	49.76	49.76	82.26	43.65	43.65
Movement LOS	E	A	A	A	A	F	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	8.34			35.93			49.76			55.74		
Approach LOS	A			D			D			E		
d_I, Intersection Delay [s/veh]	26.47											
Intersection LOS	C											
Intersection V/C	0.986											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.724			2.952			2.704			2.111		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1527			1527			327			327		
d_b, Bicycle Delay [s]	3.07			3.07			38.47			38.47		
I_b,int, Bicycle LOS Score for Intersection	2.746			2.759			1.989			1.913		
Bicycle LOS	B			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.523

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	125	1291	75	55	1195	67	73	39	92	99	51	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	1291	75	55	1195	67	73	39	92	99	51	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	323	19	14	299	17	18	10	23	25	13	12
Total Analysis Volume [veh/h]	125	1291	75	55	1195	67	73	39	92	99	51	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	87	87	87	87	87	87	15	15
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.79	0.79	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.37	0.03	0.34	0.34	0.11	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1258	1511	1431	1233	1511	1431	282	287
d1, Uniform Delay [s]	2.48	3.67	3.64	2.38	3.52	3.49	46.65	46.42
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	1.04	1.07	0.07	0.91	0.93	3.49	2.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.47	0.46	0.04	0.43	0.43	0.72	0.68
d, Delay for Lane Group [s/veh]	2.64	4.71	4.71	2.45	4.42	4.41	50.14	49.27
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.51	4.24	3.95	0.22	3.75	3.48	5.70	5.42
50th-Percentile Queue Length [ft/ln]	12.73	105.94	98.64	5.38	93.65	86.93	142.62	135.50
95th-Percentile Queue Length [veh/ln]	0.92	7.61	7.10	0.39	6.74	6.26	9.62	9.24
95th-Percentile Queue Length [ft/ln]	22.91	190.34	177.55	9.68	168.57	156.47	240.55	230.95

**Movement, Approach, & Intersection Results**

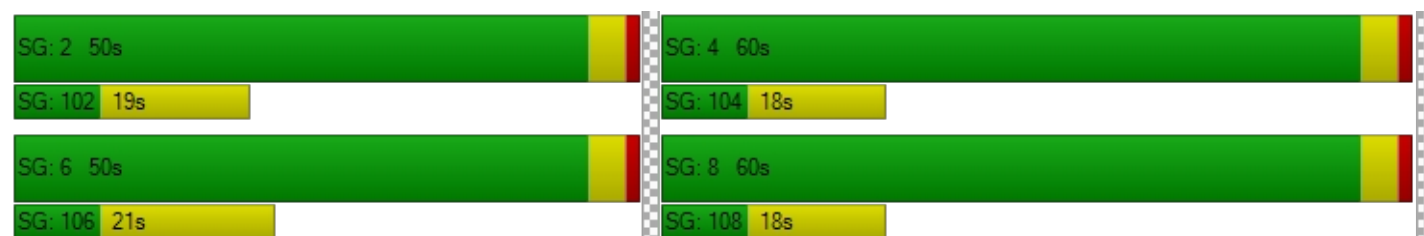
d_M, Delay for Movement [s/veh]	2.64	4.71	4.71	2.45	4.42	4.41	50.14	50.14	50.14	49.27	49.27	49.27
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.54			4.34			50.14			49.27		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.09											
Intersection LOS	B											
Intersection V/C	0.523											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.011			2.945			2.120			1.981		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.790			2.646			1.896			1.883		
Bicycle LOS	C			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	38.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	279	1267	229	191	1153	192	189	743	198	214	1056	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	279	1267	229	191	1153	192	189	743	198	214	1056	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	317	57	48	288	48	47	186	50	54	264	42
Total Analysis Volume [veh/h]	279	1267	229	191	1153	192	189	743	198	214	1056	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	42	0	11	39	0	18	39	0	18	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	38	38	7	35	35	13	35	35	14	36	36
g / C, Green / Cycle	0.09	0.35	0.35	0.06	0.32	0.32	0.12	0.32	0.32	0.13	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.08	0.33	0.13	0.05	0.29	0.13	0.11	0.13	0.11	0.12	0.19	0.09
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	318	1311	621	223	1207	572	218	1805	570	233	1850	584
d1, Uniform Delay [s]	49.39	35.40	27.04	51.01	36.09	29.56	47.45	29.53	28.86	47.33	30.79	27.64
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	6.09	0.37	9.17	3.18	0.49	9.88	0.70	1.67	13.86	1.28	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.88	0.97	0.37	0.86	0.91	0.42	0.87	0.41	0.35	0.92	0.57	0.28
d, Delay for Lane Group [s/veh]	57.03	41.49	27.40	60.18	39.27	30.05	57.34	30.23	30.53	61.19	32.08	28.85
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.11	17.38	4.56	2.88	14.51	5.07	5.66	5.24	4.26	6.66	7.89	3.44
50th-Percentile Queue Length [ft/ln]	102.77	434.58	113.90	72.06	362.67	126.81	141.52	130.91	106.61	166.57	197.30	86.12
95th-Percentile Queue Length [veh/ln]	7.40	24.22	8.06	5.19	20.75	8.77	9.56	8.99	7.65	10.90	12.50	6.20
95th-Percentile Queue Length [ft/ln]	184.99	605.52	201.41	129.71	518.83	219.16	239.06	224.74	191.28	272.41	312.48	155.02

**Movement, Approach, & Intersection Results**

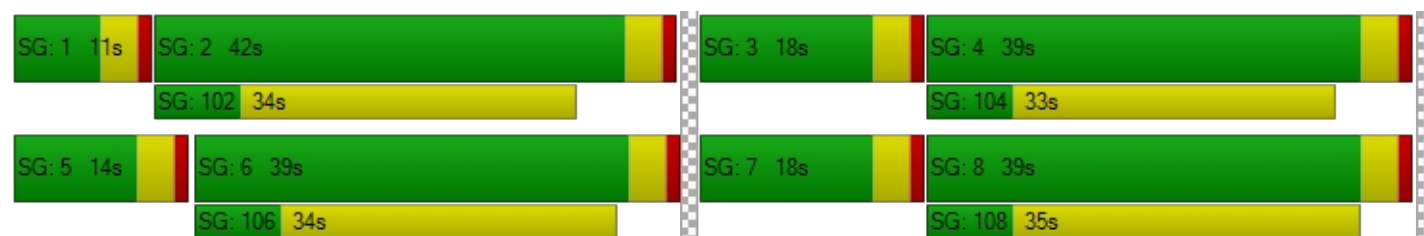
d_M, Delay for Movement [s/veh]	57.03	41.49	27.40	60.18	38.88	30.05	57.34	30.23	30.53	61.19	32.08	28.85
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	42.12			40.43			34.82			36.04		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	38.79											
Intersection LOS	D											
Intersection V/C	0.794											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.142			3.043			3.059			3.052		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			636			636		
d_b, Bicycle Delay [s]	23.56			25.57			25.57			25.57		
I_b,int, Bicycle LOS Score for Intersection	3.024			2.404			2.181			2.349		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.886

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	243	1199	101	188	1005	189	209	708	145	254	801	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	243	1199	101	188	1005	189	209	708	145	254	801	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	300	25	47	251	47	52	177	36	64	200	35
Total Analysis Volume [veh/h]	243	1199	101	188	1005	189	209	708	145	254	801	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	50	0	10	47	0	12	40	0	10	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	39	49	36	36	15	39	39	10	34	34
g / C, Green / Cycle	0.45	0.35	0.35	0.45	0.33	0.33	0.13	0.35	0.35	0.09	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.14	0.32	0.06	0.10	0.26	0.11	0.12	0.18	0.08	0.07	0.26	0.25
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	446	1346	638	349	1244	589	239	1338	634	323	592	561
d1, Uniform Delay [s]	19.50	33.57	24.34	18.84	33.90	27.86	46.86	28.37	25.25	48.95	35.31	34.70
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.04	2.25	0.11	1.29	1.30	0.31	9.58	1.48	0.89	4.24	13.08	11.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.89	0.16	0.54	0.81	0.32	0.87	0.52	0.24	0.79	0.83	0.79
d, Delay for Lane Group [s/veh]	20.54	35.82	24.46	20.13	35.20	28.18	56.45	29.85	26.13	53.19	48.39	45.75
Lane Group LOS	C	D	C	C	D	C	E	C	C	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.07	15.17	1.82	3.07	12.30	3.78	6.23	7.56	2.94	3.60	14.28	12.46
50th-Percentile Queue Length [ft/ln]	101.81	379.31	45.56	76.81	307.44	94.57	155.70	188.93	73.58	89.98	356.96	311.39
95th-Percentile Queue Length [veh/ln]	7.33	21.56	3.28	5.53	18.05	6.81	10.32	12.07	5.30	6.48	20.48	18.24
95th-Percentile Queue Length [ft/ln]	183.25	539.01	82.01	138.26	451.22	170.23	258.03	301.64	132.45	161.96	511.88	456.09

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	20.54	35.82	24.46	20.13	35.20	28.18	56.45	29.82	26.13	53.19	47.38	45.75
Movement LOS	C	D	C	C	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	32.67			32.19			34.56			48.42		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	36.56											
Intersection LOS	D											
Intersection V/C	0.886											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.941			2.938			2.955			3.008		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			782			655			618		
d_b, Bicycle Delay [s]	18.62			20.40			24.89			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.833			2.700			2.144			2.544		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 22: Harbor Boulevard at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.654

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	476	0	0	348	128	0	0	0	77	95	91
Total Analysis Volume [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	68	59	59		24	24	24
g / C, Green / Cycle	0.05	0.68	0.59	0.59		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.33	0.33	0.35		0.17	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3881	2230	1056		431	909	431
d1, Uniform Delay [s]	45.77	7.65	12.81	13.18		34.89	32.16	36.23
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.41	0.45	1.06	2.53		2.21	0.31	4.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.49	0.57	0.60		0.71	0.42	0.84
d, Delay for Lane Group [s/veh]	47.18	8.09	13.87	15.70		37.10	32.46	40.71
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.96	5.85	8.50	9.14		7.02	3.89	8.81
50th-Percentile Queue Length [ft/ln]	23.97	146.32	212.41	228.58		175.47	97.29	220.15
95th-Percentile Queue Length [veh/ln]	1.73	9.82	13.28	14.10		11.36	7.00	13.67
95th-Percentile Queue Length [ft/ln]	43.14	245.50	331.92	352.56		284.09	175.12	341.82

**Movement, Approach, & Intersection Results**

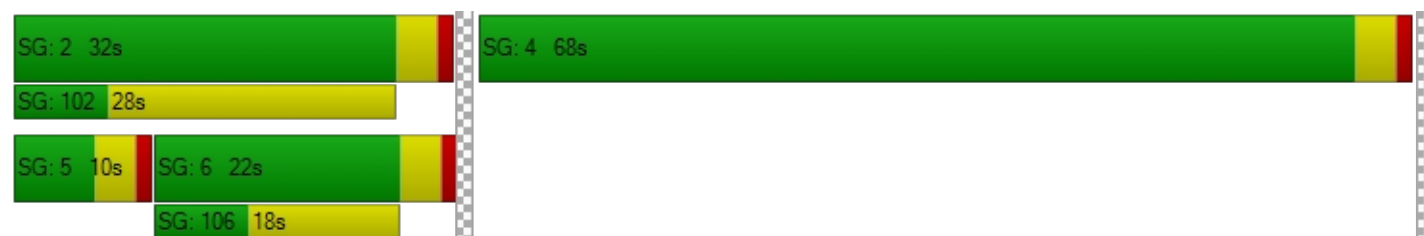
d_M, Delay for Movement [s/veh]	47.18	8.09	0.00	0.00	14.03	15.70	0.00	0.00	0.00	37.10	32.46	40.71
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.61			14.48			0.00			36.67		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.25											
Intersection LOS	B											
Intersection V/C	0.654											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.192			2.392		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.648			2.606			4.132			2.425		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	302	0	0	304	84	0	0	0	42	142	154
Total Analysis Volume [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	43	43		38	38	38
g / C, Green / Cycle	0.07	0.54	0.43	0.43		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.27	0.29		0.21	0.19	0.34
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	3087	1637	775		681	719	681
d1, Uniform Delay [s]	45.74	13.33	22.27	22.75		24.33	23.88	29.32
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.37	1.87	4.53		0.68	0.55	9.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.39	0.63	0.67		0.54	0.50	0.90
d, Delay for Lane Group [s/veh]	56.22	13.71	24.15	27.28		25.01	24.43	38.52
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	5.13	9.62	10.36		6.85	6.57	15.14
50th-Percentile Queue Length [ft/ln]	70.64	128.25	240.43	259.06		171.17	164.13	378.58
95th-Percentile Queue Length [veh/ln]	5.09	8.84	14.70	15.64		11.14	10.77	21.52
95th-Percentile Queue Length [ft/ln]	127.15	221.11	367.58	391.04		278.46	269.19	538.12

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.22	13.71	0.00	0.00	24.61	27.28	0.00	0.00	0.00	25.01	24.64	38.52
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	16.99			25.19			0.00			31.01		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.51											
Intersection LOS	C											
Intersection V/C	0.778											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.209			2.383		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.414			4.132			2.672		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	336	54	68	369	0	175	72	37	0	0	0
Total Analysis Volume [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	10	68	24	24	24	
g / C, Green / Cycle	0.54	0.54	0.10	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.20	0.15	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3079	972	339	3859	850	462	437	
d1, Uniform Delay [s]	13.83	12.00	44.22	7.03	35.83	33.78	31.19	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.45	0.52	4.42	0.29	2.08	1.39	0.45	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.44	0.22	0.80	0.38	0.82	0.62	0.33	
d, Delay for Lane Group [s/veh]	14.28	12.52	48.64	7.32	37.90	35.17	31.64	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.91	2.54	3.48	4.14	8.18	6.34	2.94	
50th-Percentile Queue Length [ft/ln]	147.75	63.52	87.09	103.39	204.62	158.45	73.44	
95th-Percentile Queue Length [veh/ln]	9.90	4.57	6.27	7.44	12.88	10.47	5.29	
95th-Percentile Queue Length [ft/ln]	247.42	114.34	156.75	186.11	321.92	261.67	132.19	

**Movement, Approach, & Intersection Results**

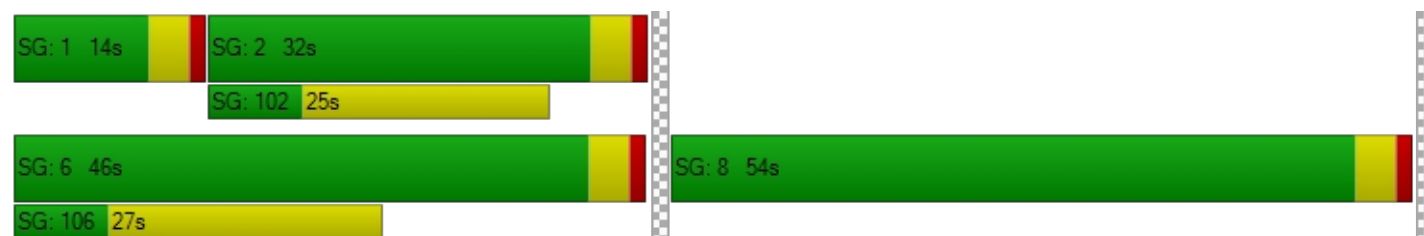
d_M, Delay for Movement [s/veh]	0.00	14.28	12.52	48.64	7.32	0.00	37.90	35.17	31.64	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	14.04			13.76			36.40			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.64											
Intersection LOS	B											
Intersection V/C	0.583											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.412			2.097		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.415			2.520			3.431			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	246	52	102	236	0	79	104	14	0	0	0
Total Analysis Volume [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	51	51	14	69	23	23	23	
g / C, Green / Cycle	0.51	0.51	0.14	0.69	0.23	0.23	0.23	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.20	0.19	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1921	910	490	2605	422	445	422	
d1, Uniform Delay [s]	15.46	15.69	41.85	6.57	36.78	36.30	30.27	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.66	1.53	3.74	0.39	5.47	3.83	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.44	0.83	0.36	0.87	0.82	0.14	
d, Delay for Lane Group [s/veh]	16.12	17.22	45.60	6.97	42.25	40.13	30.42	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.64	5.93	5.11	3.81	9.07	8.80	1.10	
50th-Percentile Queue Length [ft/ln]	140.92	148.21	127.65	95.35	226.73	219.94	27.48	
95th-Percentile Queue Length [veh/ln]	9.53	9.92	8.81	6.87	14.01	13.66	1.98	
95th-Percentile Queue Length [ft/ln]	238.27	248.04	220.29	171.63	350.20	341.55	49.46	

**Movement, Approach, & Intersection Results**

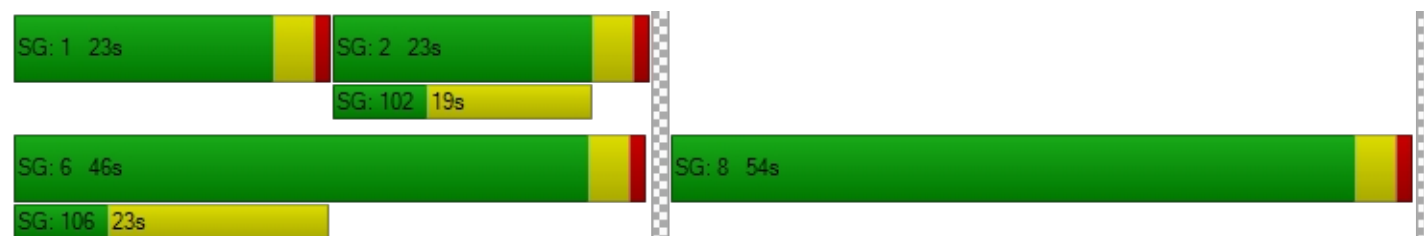
d_M, Delay for Movement [s/veh]	0.00	16.34	17.22	45.60	6.97	0.00	42.25	40.37	30.42	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	16.49			18.62			40.41			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.01											
Intersection LOS	C											
Intersection V/C	0.614											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.201			2.222		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.216			2.675			2.210			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.139

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	78	514	80	16	678
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	78	514	80	16	678
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	20	129	20	4	170
Total Analysis Volume [veh/h]	0	78	514	80	16	678
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**




V/C, Movement V/C Ratio	0.00	0.14	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	12.46	0.00	0.00	8.73	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.48	0.00	0.00	0.05	0.00
95th-Percentile Queue Length [ft/ln]	0.00	12.03	0.00	0.00	1.24	0.00
d_A, Approach Delay [s/veh]	12.46		0.00		0.20	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.81					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.525

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	867	223	80	587	0	46	0	54	272	0	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	867	223	80	587	0	46	0	54	272	0	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	217	56	20	147	0	12	0	14	68	0	18
Total Analysis Volume [veh/h]	0	867	223	80	587	0	46	0	54	272	0	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	74	74	83	83	19	19	19	19
g / C, Green / Cycle	0.67	0.67	0.76	0.76	0.17	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.29	0.30	0.04	0.15	0.03	0.03	0.15	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1272	1205	1188	2874	341	340	295	308
d1, Uniform Delay [s]	8.43	8.62	3.42	3.86	38.79	38.97	44.53	39.40
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	1.23	0.02	0.16	0.18	0.22	11.54	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.45	0.07	0.20	0.13	0.16	0.92	0.24
d, Delay for Lane Group [s/veh]	9.49	9.85	3.44	4.02	38.97	39.18	56.06	39.79
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.88	6.04	0.39	1.65	1.08	1.27	8.14	1.74
50th-Percentile Queue Length [ft/ln]	147.01	151.09	9.74	41.17	26.91	31.75	203.47	43.53
95th-Percentile Queue Length [veh/ln]	9.86	10.08	0.70	2.96	1.94	2.29	12.82	3.13
95th-Percentile Queue Length [ft/ln]	246.43	251.88	17.53	74.11	48.44	57.15	320.43	78.36

**Movement, Approach, & Intersection Results**

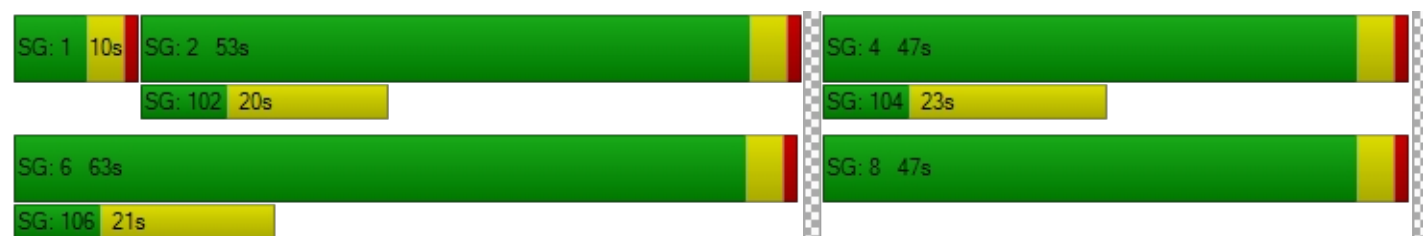
d_M, Delay for Movement [s/veh]	0.00	9.62	9.85	3.44	4.02	0.00	38.97	39.18	39.18	56.06	0.00	39.79
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	9.67			3.95			39.08			52.62		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	16.00											
Intersection LOS	B											
Intersection V/C	0.525											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.697			1.773			2.239		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.459			2.110			1.725			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.122

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	27	443	347	7	62	77
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	443	347	7	62	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	111	87	2	16	19
Total Analysis Volume [veh/h]	27	443	347	7	62	77
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.12	0.11
d_M, Delay for Movement [s/veh]	8.06	0.00	0.00	0.00	13.90	12.02
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	0.90	0.90
95th-Percentile Queue Length [ft/ln]	1.72	0.00	0.00	0.00	22.43	22.43
d_A, Approach Delay [s/veh]	0.46		0.00		12.86	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.08					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	55	463	429	1	7	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	463	429	1	7	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	116	107	0	2	27
Total Analysis Volume [veh/h]	55	463	429	1	7	109
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**




V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.02	0.17
d_M, Delay for Movement [s/veh]	8.35	0.00	0.00	0.00	14.39	12.13
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	0.70	0.70
95th-Percentile Queue Length [ft/ln]	3.83	0.00	0.00	0.00	17.38	17.38
d_A, Approach Delay [s/veh]	0.89		0.00		12.27	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.77					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.076

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	506	28	42	552	31	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	506	28	42	552	31	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	127	7	11	138	8	15
Total Analysis Volume [veh/h]	506	28	42	552	31	61
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**


V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.08	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	8.63	0.00	15.43	13.12
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.13	0.00	0.67	0.67
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.17	0.00	16.84	16.84
d_A, Approach Delay [s/veh]	0.00		0.61		13.90	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.34					
Intersection LOS	C					

### Intersection Level Of Service Report

#### Intersection 31: Lemon Street at Parking Structure

Control Type:	Two-way stop	Delay (sec / veh):	16.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.447

#### Intersection Setup

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	33	830	42	0	672	11	0	0	28	0	0	254
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	830	42	0	672	11	0	0	28	0	0	254
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	208	11	0	168	3	0	0	7	0	0	64
Total Analysis Volume [veh/h]	33	830	42	0	672	11	0	0	28	0	0	254
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.45
d_M, Delay for Movement [s/veh]	9.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.75	0.00	0.00	16.36
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	2.29
95th-Percentile Queue Length [ft/ln]	2.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.35	0.00	0.00	57.28
d_A, Approach Delay [s/veh]	0.33			0.00			10.75			16.36		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	2.54											
Intersection LOS	C											





*APPENDIX B-II*

**EXISTING SATURDAY ARRIVAL PEAK HOUR  
TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	92	519	104	228	549	167	161	602	93	117	810	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	519	104	228	549	167	161	602	93	117	810	229
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	130	26	57	137	42	40	151	23	29	203	57
Total Analysis Volume [veh/h]	92	519	104	228	549	167	161	602	93	117	810	229
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	42	0	12	43	0	14	43	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	56	56	8	58	58	10	24	24	6	20	20
g / C, Green / Cycle	0.05	0.51	0.51	0.07	0.53	0.53	0.09	0.22	0.22	0.05	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.06	0.07	0.13	0.13	0.09	0.12	0.13	0.03	0.14	0.13
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	182	2889	912	257	2007	951	165	838	397	189	1043	329
d1, Uniform Delay [s]	50.80	14.73	14.21	50.56	14.06	14.05	49.90	38.10	38.35	50.98	42.84	42.11
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.15	0.14	0.25	9.94	0.29	0.60	27.49	0.58	1.34	3.31	1.28	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.18	0.11	0.89	0.24	0.24	0.98	0.55	0.58	0.62	0.78	0.70
d, Delay for Lane Group [s/veh]	52.94	14.87	14.47	60.49	14.34	14.65	77.38	38.68	39.70	54.30	44.13	44.76
Lane Group LOS	D	B	B	E	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.29	2.35	1.41	3.46	3.29	3.19	5.66	5.61	5.68	1.66	7.08	6.04
50th-Percentile Queue Length [ft/ln]	32.19	58.81	35.18	86.46	82.27	79.75	141.50	140.26	142.07	41.59	176.99	151.02
95th-Percentile Queue Length [veh/ln]	2.32	4.23	2.53	6.23	5.92	5.74	9.56	9.49	9.59	2.99	11.44	10.07
95th-Percentile Queue Length [ft/ln]	57.94	105.86	63.33	155.63	148.09	143.55	239.05	237.37	239.80	74.85	286.08	251.79



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	52.94	14.87	14.47	60.49	14.38	14.65	77.38	38.91	39.70	54.30	44.13	44.76
Movement LOS	D	B	B	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	19.71			25.57			46.23			45.28		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	35.45											
Intersection LOS	D											
Intersection V/C	0.454											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.018			2.961			2.872			3.085		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			709			691		
d_b, Bicycle Delay [s]	23.56			22.91			22.91			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.953			2.079			2.030			2.195		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	19	811	542	77	860	31	63	121	27	485	83	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	811	542	77	860	31	63	121	27	485	83	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	203	136	19	215	8	16	30	7	121	21	0
Total Analysis Volume [veh/h]	19	811	542	77	860	31	63	121	27	485	83	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	58	6	62	62	9	9	9	20	20
g / C, Green / Cycle	0.02	0.53	0.06	0.56	0.56	0.08	0.08	0.08	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.14	0.04	0.19	0.10	0.04	0.06	0.02	0.16	0.16
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	45	3013	100	2125	1007	153	162	153	333	333
d1, Uniform Delay [s]	52.88	14.27	51.28	13.18	11.84	47.74	49.20	46.77	43.34	43.45
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.11	0.22	11.51	0.43	0.37	1.76	6.72	0.54	5.92	6.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.27	0.77	0.34	0.17	0.41	0.75	0.18	0.85	0.86
d, Delay for Lane Group [s/veh]	59.00	14.49	62.79	13.62	12.21	49.50	55.92	47.31	49.26	49.85
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.59	3.69	2.41	4.80	2.13	1.71	3.54	0.71	7.92	8.08
50th-Percentile Queue Length [ft/ln]	14.85	92.13	60.30	119.88	53.32	42.82	88.61	17.77	197.94	202.05
95th-Percentile Queue Length [veh/ln]	1.07	6.63	4.34	8.39	3.84	3.08	6.38	1.28	12.53	12.74
95th-Percentile Queue Length [ft/ln]	26.73	165.83	108.54	209.67	95.98	77.08	159.50	31.99	313.31	318.60

**Movement, Approach, & Intersection Results**

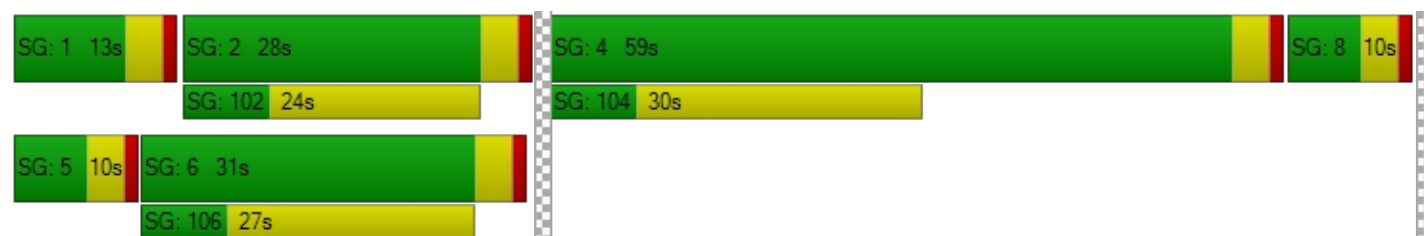
d_M, Delay for Movement [s/veh]	59.00	14.49	0.00	62.79	13.38	12.21	49.50	55.92	47.31	49.51	49.85	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	15.50			17.27			52.90			49.56		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.74											
Intersection LOS	C											
Intersection V/C	0.494											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.860			2.224			2.199		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.016			2.092			1.908			2.497		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	82	1091	43	166	1183	27	30	91	107	83	112	289
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1091	43	166	1183	27	30	91	107	83	112	289
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	273	11	42	296	7	8	23	27	21	28	72
Total Analysis Volume [veh/h]	82	1091	43	166	1183	27	30	91	107	83	112	289
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	60	0	13	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	7	71	71	9	73	73	18	18	18	18	18	31
g / C, Green / Cycle	0.06	0.64	0.64	0.08	0.67	0.67	0.16	0.16	0.16	0.16	0.16	0.28
(v / s)_i Volume / Saturation Flow Rate	0.05	0.31	0.30	0.05	0.31	0.02	0.02	0.05	0.06	0.05	0.06	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	109	1223	1159	292	2533	1200	235	311	295	253	311	510
d1, Uniform Delay [s]	50.85	10.09	10.04	48.49	8.87	6.20	39.08	40.36	40.86	40.29	40.84	33.61
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.15
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.12	1.35	1.39	1.74	0.62	0.03	0.24	0.52	0.75	0.75	0.70	1.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.48	0.47	0.57	0.47	0.02	0.13	0.29	0.36	0.33	0.36	0.57
d, Delay for Lane Group [s/veh]	60.97	11.44	11.42	50.23	9.49	6.24	39.32	40.88	41.61	41.03	41.54	34.96
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.53	7.23	6.74	2.26	6.48	0.21	0.71	2.21	2.64	2.02	2.76	6.74
50th-Percentile Queue Length [ft/ln]	63.13	180.75	168.60	56.53	162.11	5.29	17.66	55.21	65.93	50.56	68.88	168.41
95th-Percentile Queue Length [veh/ln]	4.55	11.64	11.00	4.07	10.66	0.38	1.27	3.98	4.75	3.64	4.96	10.99
95th-Percentile Queue Length [ft/ln]	113.63	290.99	275.08	101.75	266.51	9.52	31.79	99.39	118.67	91.01	123.99	274.82



**Movement, Approach, & Intersection Results**

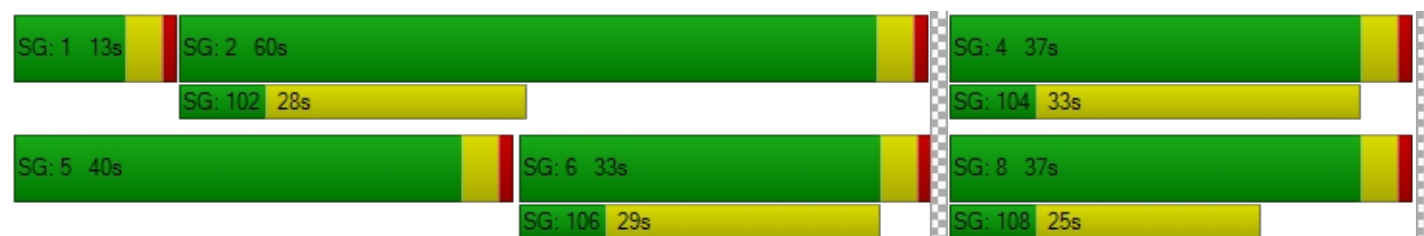
d_M, Delay for Movement [s/veh]	60.97	11.43	11.42	50.23	9.49	6.24	39.32	40.88	41.61	41.03	41.54	34.96
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	14.77			14.34			41.02			37.53		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.74											
Intersection LOS	B											
Intersection V/C	0.563											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.932			3.034			2.250			2.462		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1018			527			600			600		
d_b, Bicycle Delay [s]	13.25			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.563			2.695			1.936			2.358		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.419

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	212	260	60	88	180	21	16	209	131	76	280	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	212	260	60	88	180	21	16	209	131	76	280	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	65	15	22	45	5	4	52	33	19	70	34
Total Analysis Volume [veh/h]	212	260	60	88	180	21	16	209	131	76	280	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	35	0	0	30	0	0	45	45	0	45	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	41	41	41	41	16	16	61	16	16	16
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.14	0.14	0.55	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.12	0.14	0.03	0.05	0.11	0.01	0.11	0.07	0.04	0.12	0.11
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	673	673	673	673	673	113	272	996	126	272	258
d1, Uniform Delay [s]	24.40	25.16	22.26	22.63	24.23	40.65	45.26	11.81	42.06	45.64	45.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.23	1.68	0.26	0.40	1.14	0.56	4.54	0.27	4.54	6.04	4.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.32	0.39	0.09	0.13	0.30	0.14	0.77	0.13	0.60	0.82	0.75
d, Delay for Lane Group [s/veh]	25.62	26.83	22.53	23.03	25.36	41.21	49.81	12.08	46.61	51.68	49.46
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.13	5.24	1.06	1.58	3.88	0.39	5.81	1.60	2.01	6.34	5.35
50th-Percentile Queue Length [ft/ln]	103.15	131.03	26.39	39.39	97.04	9.84	145.31	39.89	50.18	158.47	133.68
95th-Percentile Queue Length [veh/ln]	7.43	9.00	1.90	2.84	6.99	0.71	9.77	2.87	3.61	10.47	9.14
95th-Percentile Queue Length [ft/ln]	185.67	224.89	47.50	70.90	174.67	17.72	244.15	71.80	90.33	261.69	228.49

**Movement, Approach, & Intersection Results**

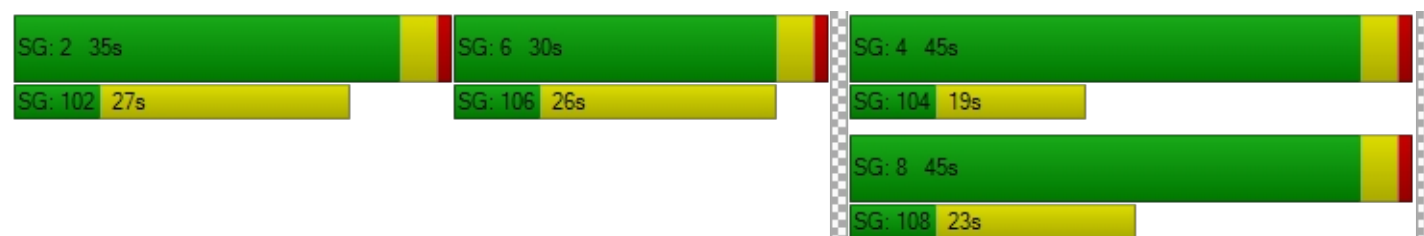
d_M, Delay for Movement [s/veh]	25.62	26.83	22.53	23.03	25.36	25.36	41.21	49.81	12.08	46.61	51.23	49.46
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	25.86			24.65			35.54			50.03		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.84											
Intersection LOS	C											
Intersection V/C	0.419											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.473			2.200			2.479			2.348		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			473			745			745		
d_b, Bicycle Delay [s]	28.37			32.07			21.64			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.437			2.036			2.147			1.966		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.298

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	15	141	78	253	376	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	141	78	253	376	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	35	20	63	94	7
Total Analysis Volume [veh/h]	15	141	78	253	376	28
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.04	0.13	0.20	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	176	176	1435	1576	1576	1493
d1, Uniform Delay [s]	45.10	48.53	1.67	1.84	1.99	1.62
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	8.26	0.07	0.22	0.36	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.80	0.05	0.16	0.24	0.02
d, Delay for Lane Group [s/veh]	45.31	56.79	1.74	2.06	2.34	1.64
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.38	4.18	0.22	0.77	1.24	0.08
50th-Percentile Queue Length [ft/ln]	9.58	104.41	5.45	19.31	31.09	1.89
95th-Percentile Queue Length [veh/ln]	0.69	7.52	0.39	1.39	2.24	0.14
95th-Percentile Queue Length [ft/ln]	17.24	187.95	9.80	34.76	55.97	3.40



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	45.31	56.79	1.74	2.06	2.34	1.64
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.68		1.98		2.30	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	11.53					
Intersection LOS	B					
Intersection V/C	0.298					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.146	2.225	2.168
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.679	4.799
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 6: Euclid Street at Malvern Avenue

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.397

#### Intersection Setup

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	57	1021	21	17	957	46	66	38	71	29	33	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	1021	21	17	957	46	66	38	71	29	33	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	255	5	4	239	12	17	10	18	7	8	5
Total Analysis Volume [veh/h]	57	1021	21	17	957	46	66	38	71	29	33	18
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	59	0	10	59	0	11	30	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	88	82	82	88	79	79	14	6	6	14	5	5
g / C, Green / Cycle	0.80	0.74	0.74	0.80	0.72	0.72	0.13	0.06	0.06	0.13	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.28	0.01	0.27	0.27	0.04	0.02	0.04	0.02	0.01	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1333	1407	1333	1339	1364	1292	306	112	106	261	83	78
d1, Uniform Delay [s]	2.28	5.16	5.14	2.23	6.03	5.99	43.47	49.75	50.76	42.56	51.05	51.04
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.79	0.82	0.00	0.81	0.83	0.35	1.79	7.19	0.19	2.20	2.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.38	0.38	0.01	0.38	0.37	0.22	0.34	0.67	0.11	0.32	0.31
d, Delay for Lane Group [s/veh]	2.34	5.94	5.96	2.23	6.84	6.82	43.82	51.54	57.95	42.75	53.25	53.28
Lane Group LOS	A	A	A	A	A	A	D	D	E	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.21	4.06	3.83	0.06	4.39	4.08	1.66	1.06	2.12	0.71	0.76	0.71
50th-Percentile Queue Length [ft/ln]	5.30	101.62	95.70	1.42	109.80	102.04	41.49	26.49	53.12	17.87	18.93	17.63
95th-Percentile Queue Length [veh/ln]	0.38	7.32	6.89	0.10	7.83	7.35	2.99	1.91	3.82	1.29	1.36	1.27
95th-Percentile Queue Length [ft/ln]	9.55	182.92	172.26	2.55	195.73	183.68	74.68	47.67	95.61	32.16	34.08	31.73

**Movement, Approach, & Intersection Results**

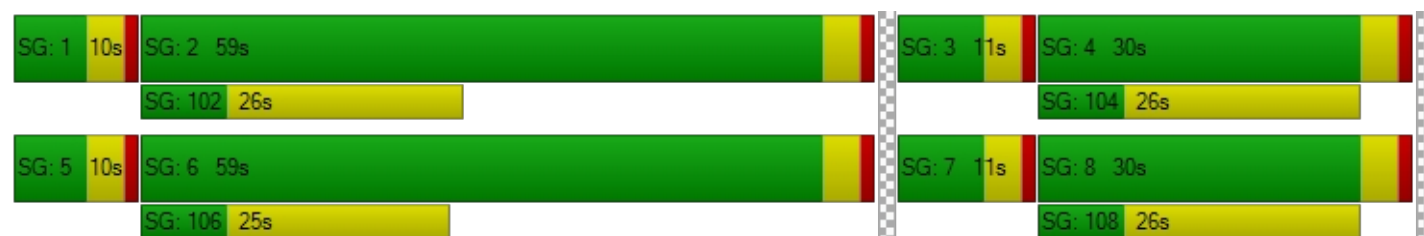
d_M, Delay for Movement [s/veh]	2.34	5.95	5.96	2.23	6.83	6.82	43.82	51.54	57.95	42.75	53.25	53.28
Movement LOS	A	A	A	A	A	A	D	D	E	D	D	D
d_A, Approach Delay [s/veh]	5.77			6.75			51.23			49.45		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.01											
Intersection LOS	B											
Intersection V/C	0.397											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.733			2.730			2.430			2.358		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1000			473			473		
d_b, Bicycle Delay [s]	13.75			13.75			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.466			2.401			1.704			1.626		
Bicycle LOS	B			B			A			A		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	928	128	122	777	157	164	422	118	174	472	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	928	128	122	777	157	164	422	118	174	472	122
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	232	32	31	194	39	41	106	30	44	118	31
Total Analysis Volume [veh/h]	116	928	128	122	777	157	164	422	118	174	472	122
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	43	0	10	43	0	14	47	0	10	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	71	61	61	71	61	61	31	21	21	31	17	17
g / C, Green / Cycle	0.65	0.56	0.56	0.65	0.56	0.56	0.28	0.19	0.19	0.28	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.28	0.07	0.26	0.24	0.09	0.15	0.14	0.10	0.12	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	964	1055	1000	915	1056	1000	393	361	342	347	589	279
d1, Uniform Delay [s]	7.38	15.35	15.10	7.41	14.68	14.39	31.27	42.57	42.04	31.46	44.88	42.17
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	1.86	1.81	0.07	1.49	1.41	0.71	4.04	3.15	1.12	2.59	1.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.52	0.50	0.13	0.47	0.44	0.42	0.80	0.74	0.50	0.80	0.44
d, Delay for Lane Group [s/veh]	7.64	17.22	16.90	7.47	16.17	15.79	31.98	46.60	45.19	32.58	47.47	43.24
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.05	8.89	7.95	1.05	7.56	6.61	3.52	7.81	6.74	3.79	6.40	3.09
50th-Percentile Queue Length [ft/ln]	26.29	222.14	198.72	26.36	188.90	165.27	88.07	195.21	168.42	94.65	159.94	77.19
95th-Percentile Queue Length [veh/ln]	1.89	13.77	12.57	1.90	12.06	10.83	6.34	12.39	10.99	6.81	10.55	5.56
95th-Percentile Queue Length [ft/ln]	47.31	344.35	314.32	47.44	301.60	270.68	158.52	309.78	274.84	170.37	263.64	138.95



**Movement, Approach, & Intersection Results**

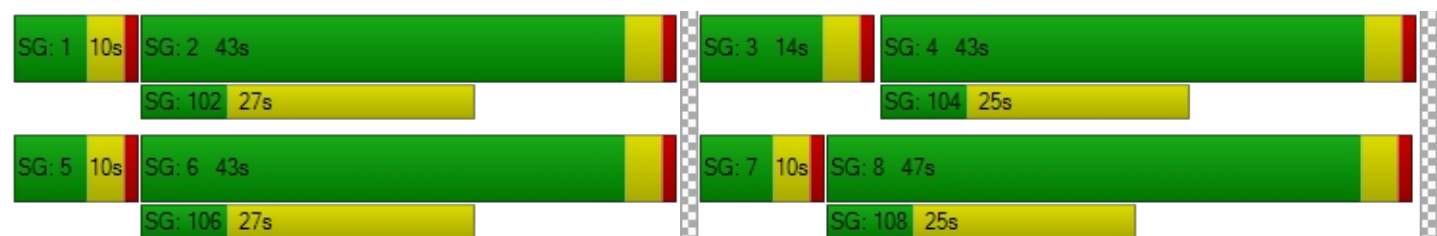
d_M, Delay for Movement [s/veh]	7.64	17.09	16.90	7.47	16.03	15.79	31.98	46.15	45.19	32.58	47.47	43.24
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	16.13			15.01			42.69			43.43		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.53											
Intersection LOS	C											
Intersection V/C	0.641											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.798			2.792			2.687			2.796		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			709			782			709		
d_b, Bicycle Delay [s]	22.91			22.91			20.40			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.527			2.431			2.140			2.193		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.419

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	118	290	100	25	371	56	87	523	118	116	581	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	290	100	25	371	56	87	523	118	116	581	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	73	25	6	93	14	22	131	30	29	145	10
Total Analysis Volume [veh/h]	118	290	100	25	371	56	87	523	118	116	581	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	32	0	11	29	0	15	50	0	17	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	70	62	62	70	60	60	7	23	23	6	22	22
g / C, Green / Cycle	0.63	0.57	0.57	0.63	0.54	0.54	0.06	0.21	0.21	0.05	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.07	0.08	0.06	0.01	0.12	0.11	0.05	0.18	0.17	0.03	0.15	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1113	2147	1017	1158	1029	974	112	391	370	188	748	354
d1, Uniform Delay [s]	7.99	11.27	11.02	7.58	13.12	13.06	50.85	42.29	41.74	50.97	41.91	36.29
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.13	0.19	0.01	0.48	0.49	10.72	5.97	4.42	3.25	1.77	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.11	0.14	0.10	0.02	0.22	0.21	0.77	0.87	0.82	0.62	0.78	0.11
d, Delay for Lane Group [s/veh]	8.19	11.40	11.22	7.58	13.60	13.55	61.56	48.26	46.16	54.22	43.68	36.43
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.11	1.67	1.15	0.21	2.94	2.69	2.69	9.49	8.22	1.65	7.62	0.88
50th-Percentile Queue Length [ft/ln]	27.87	41.69	28.83	5.36	73.55	67.22	67.31	237.18	205.44	41.20	190.42	21.93
95th-Percentile Queue Length [veh/ln]	2.01	3.00	2.08	0.39	5.30	4.84	4.85	14.54	12.92	2.97	12.14	1.58
95th-Percentile Queue Length [ft/ln]	50.16	75.05	51.89	9.64	132.39	120.99	121.15	363.47	322.97	74.16	303.58	39.48

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	8.19	11.40	11.22	7.58	13.58	13.55	61.56	47.52	46.16	54.22	43.68	36.43
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.62			13.25			48.98			44.96		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	33.06											
Intersection LOS	C											
Intersection V/C	0.419											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.643			2.479			2.693			2.817		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			455			836			873		
d_b, Bicycle Delay [s]	30.56			32.84			18.62			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.979			1.933			2.160			2.167		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	22	13	124	19	26	23	642	7	7	722	118
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	22	13	124	19	26	23	642	7	7	722	118
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	3	31	5	7	6	161	2	2	181	30
Total Analysis Volume [veh/h]	12	22	13	124	19	26	23	642	7	7	722	118
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	6	15	87	87	87	80	80	90
g / C, Green / Cycle	0.04	0.04	0.04	0.06	0.14	0.79	0.79	0.79	0.73	0.73	0.82
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.04	0.03	0.01	0.18	0.18	0.00	0.19	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	72	80	76	203	245	1394	1503	1424	1250	2761	1477
d1, Uniform Delay [s]	50.83	51.08	50.86	50.63	42.10	2.44	2.92	2.91	4.13	5.08	1.89
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	1.84	1.06	2.97	0.36	0.00	0.34	0.36	0.01	0.23	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.28	0.17	0.61	0.18	0.02	0.22	0.22	0.01	0.26	0.08
d, Delay for Lane Group [s/veh]	51.91	52.92	51.92	53.60	42.45	2.44	3.26	3.27	4.14	5.31	1.91
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.34	0.63	0.37	1.75	1.11	0.08	1.56	1.48	0.04	2.52	0.33
50th-Percentile Queue Length [ft/ln]	8.51	15.71	9.20	43.73	27.75	2.08	38.92	36.90	1.03	62.97	8.37
95th-Percentile Queue Length [veh/ln]	0.61	1.13	0.66	3.15	2.00	0.15	2.80	2.66	0.07	4.53	0.60
95th-Percentile Queue Length [ft/ln]	15.32	28.28	16.56	78.72	49.95	3.74	70.06	66.42	1.85	113.34	15.07



**Movement, Approach, & Intersection Results**

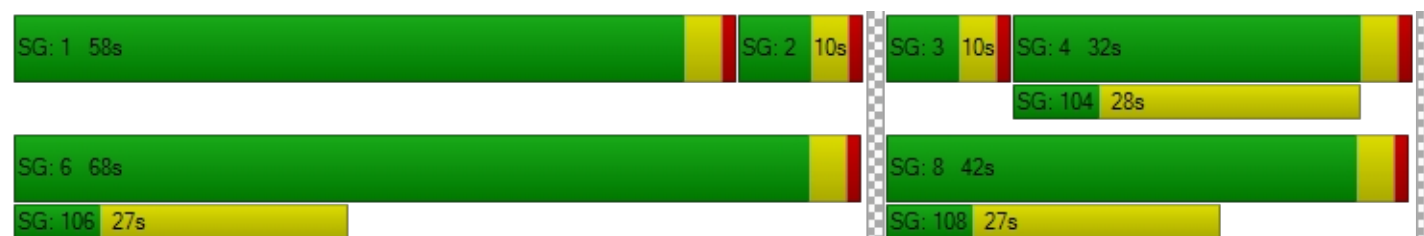
d_M, Delay for Movement [s/veh]	51.91	52.92	51.92	53.60	42.45	42.45	2.44	3.27	3.27	4.14	5.31	1.91
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.39			50.63			3.24			4.83		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.96											
Intersection LOS	A											
Intersection V/C	0.270											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.170			2.246			2.606			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.637			1.838			2.114			2.258		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.408

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	71	107	94	118	172	71	52	653	59	95	769	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	71	107	94	118	172	71	52	653	59	95	769	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	27	24	30	43	18	13	163	15	24	192	13
Total Analysis Volume [veh/h]	71	107	94	118	172	71	52	653	59	95	769	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	40	0	19	39	0	10	38	0	13	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	21	9	9	21	12	12	81	71	71	81	72	72
g / C, Green / Cycle	0.19	0.08	0.08	0.19	0.10	0.10	0.74	0.65	0.65	0.74	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.05	0.07	0.07	0.06	0.03	0.20	0.19	0.05	0.22	0.22
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	327	151	143	347	199	189	1229	1232	1167	1256	1247	1182
d1, Uniform Delay [s]	37.58	49.43	49.22	38.63	47.33	47.12	3.92	8.45	8.39	4.02	8.37	8.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	5.99	5.04	0.58	3.50	3.12	0.01	0.63	0.64	0.12	0.75	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.22	0.71	0.66	0.34	0.65	0.61	0.04	0.30	0.29	0.08	0.34	0.33
d, Delay for Lane Group [s/veh]	37.90	55.42	54.26	39.20	50.83	50.24	3.93	9.08	9.03	4.14	9.12	9.08
Lane Group LOS	D	E	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.65	3.12	2.71	2.82	3.57	3.15	0.28	3.82	3.51	0.56	4.42	4.08
50th-Percentile Queue Length [ft/ln]	41.19	77.90	67.66	70.48	89.33	78.83	7.00	95.58	87.64	13.90	110.53	102.03
95th-Percentile Queue Length [veh/ln]	2.97	5.61	4.87	5.07	6.43	5.68	0.50	6.88	6.31	1.00	7.87	7.35
95th-Percentile Queue Length [ft/ln]	74.14	140.22	121.79	126.87	160.80	141.89	12.59	172.05	157.75	25.03	196.74	183.65

**Movement, Approach, & Intersection Results**

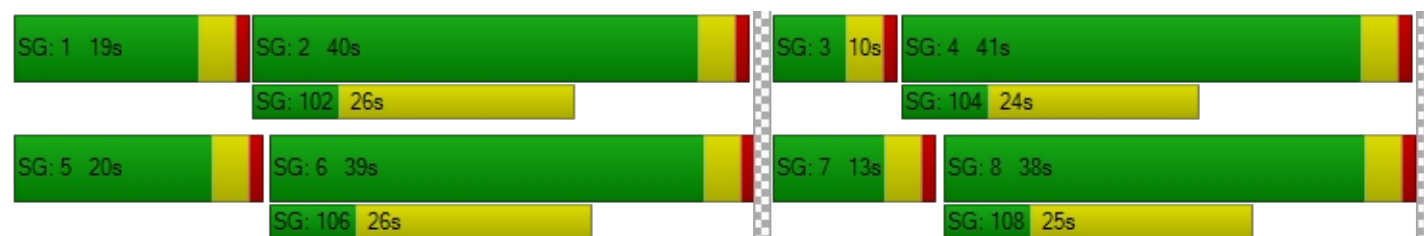
d_M, Delay for Movement [s/veh]	37.90	55.42	54.26	39.20	50.68	50.24	3.93	9.06	9.03	4.14	9.10	9.08
Movement LOS	D	E	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	50.45			46.84			8.71			8.58		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	19.52											
Intersection LOS	B											
Intersection V/C	0.408											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.516			2.330			2.648			2.673		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			636			618			673		
d_b, Bicycle Delay [s]	24.89			25.57			26.25			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.008			1.857			2.190			2.314		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.305

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	38	40	50	29	22	33	26	749	41	48	829	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	40	50	29	22	33	26	749	41	48	829	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	10	13	7	6	8	7	187	10	12	207	12
Total Analysis Volume [veh/h]	38	40	50	29	22	33	26	749	41	48	829	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	67	0	11	68	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	87	87	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.87	0.80	0.80	0.87	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.03	0.02	0.03	0.01	0.22	0.21	0.03	0.24	0.23
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	80	102	97	96	97	1550	1510	1430	1558	1533	1452
d1, Uniform Delay [s]	50.29	50.28	50.63	50.03	50.78	0.89	2.96	2.94	0.91	2.70	2.69
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.38	2.41	4.19	1.72	5.12	0.00	0.44	0.46	0.04	0.49	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.39	0.52	0.30	0.57	0.02	0.27	0.27	0.03	0.30	0.29
d, Delay for Lane Group [s/veh]	54.67	52.70	54.82	51.76	55.89	0.90	3.40	3.40	0.94	3.20	3.19
Lane Group LOS	D	D	D	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.11	1.13	1.45	0.81	1.61	0.03	1.95	1.81	0.06	2.01	1.86
50th-Percentile Queue Length [ft/ln]	27.68	28.31	36.29	20.34	40.37	0.69	48.69	45.30	1.60	50.15	46.57
95th-Percentile Queue Length [veh/ln]	1.99	2.04	2.61	1.46	2.91	0.05	3.51	3.26	0.12	3.61	3.35
95th-Percentile Queue Length [ft/ln]	49.83	50.95	65.31	36.60	72.66	1.24	87.65	81.54	2.88	90.26	83.83



**Movement, Approach, & Intersection Results**

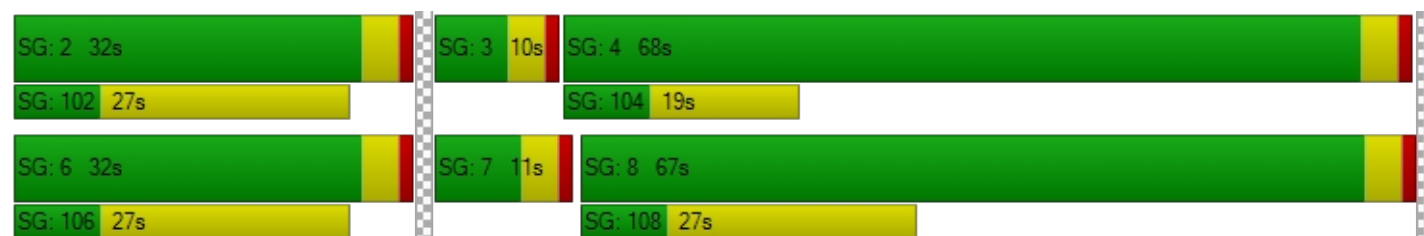
d_M, Delay for Movement [s/veh]	54.67	52.70	54.82	51.76	55.89	55.89	0.90	3.40	3.40	0.94	3.19	3.19
Movement LOS	D	D	D	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.11			54.47			3.32			3.08		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.74											
Intersection LOS	A											
Intersection V/C	0.305											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.254			2.044			2.698			2.692		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			1145			1164		
d_b, Bicycle Delay [s]	30.56			30.56			10.04			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.771			1.698			2.233			2.322		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.492

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	108	254	85	146	295	247	228	616	68	136	560	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	254	85	146	295	247	228	616	68	136	560	128
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	64	21	37	74	62	57	154	17	34	140	32
Total Analysis Volume [veh/h]	108	254	85	146	295	247	228	616	68	136	560	128
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	20	47	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	56	56	7	55	69	10	21	21	10	21	21
g / C, Green / Cycle	0.07	0.51	0.51	0.06	0.50	0.63	0.09	0.19	0.19	0.09	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.05	0.04	0.08	0.14	0.07	0.16	0.04	0.08	0.15	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	132	1947	922	211	1897	1126	316	724	343	165	729	345
d1, Uniform Delay [s]	50.28	14.03	13.74	50.72	14.96	8.93	48.74	43.06	37.50	49.15	42.18	38.72
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.52	0.14	0.20	3.99	0.17	0.10	3.12	2.95	0.28	9.91	1.74	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.13	0.09	0.69	0.16	0.22	0.72	0.85	0.20	0.83	0.77	0.37
d, Delay for Lane Group [s/veh]	61.80	14.17	13.94	54.70	15.14	9.03	51.86	46.01	37.78	59.06	43.92	39.38
Lane Group LOS	E	B	B	D	B	A	D	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.35	1.67	1.12	2.09	2.03	2.48	3.18	8.34	1.57	4.12	7.34	3.07
50th-Percentile Queue Length [ft/ln]	83.68	41.76	28.03	52.16	50.71	61.89	79.46	208.40	39.31	102.91	183.61	76.78
95th-Percentile Queue Length [veh/ln]	6.03	3.01	2.02	3.76	3.65	4.46	5.72	13.07	2.83	7.41	11.79	5.53
95th-Percentile Queue Length [ft/ln]	150.63	75.16	50.45	93.89	91.28	111.40	143.02	326.77	70.76	185.23	294.73	138.21

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	61.80	14.17	13.94	54.70	15.14	9.03	51.86	46.01	37.78	59.06	43.92	39.38
Movement LOS	E	B	B	D	B	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	25.63			21.34			46.86			45.71		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.11											
Intersection LOS	D											
Intersection V/C	0.492											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.616			2.784			2.858			2.734		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			673		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			24.22		
I_b,int, Bicycle LOS Score for Intersection	1.928			2.127			2.312			2.239		
Bicycle LOS	A			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	29	0	162	107	98	249	0
Total Analysis Volume [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	19	0	0	19	0	72	91	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	63	63	26	93
g / C, Green / Cycle		0.08	0.08	0.57	0.57	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.05	0.06	0.17	0.24	0.22	0.26
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		150	150	2162	1024	429	3206
d1, Uniform Delay [s]		48.67	49.36	12.31	13.38	40.76	1.82
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.98	8.06	0.35	1.25	7.81	0.25
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.61	0.77	0.30	0.42	0.91	0.31
d, Delay for Lane Group [s/veh]		52.65	57.43	12.66	14.63	48.56	2.07
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.60	3.45	4.11	6.09	11.11	1.38
50th-Percentile Queue Length [ft/ln]		65.04	86.29	102.71	152.34	277.83	34.60
95th-Percentile Queue Length [veh/ln]		4.68	6.21	7.40	10.14	16.58	2.49
95th-Percentile Queue Length [ft/ln]		117.07	155.32	184.88	253.55	414.51	62.28



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.65	52.65	57.43	0.00	12.66	14.63	48.56	2.07	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.31			13.44			15.20		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	17.62											
Intersection LOS	B											
Intersection V/C	0.582											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.230			1.826			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			273			273			1582		
d_b, Bicycle Delay [s]	55.00			41.02			41.02			2.40		
I_b,int, Bicycle LOS Score for Intersection	4.132			1.903			2.149			2.702		
Bicycle LOS	D			A			B			B		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	0	98	0	0	0	44	154	0	0	222	36
Total Analysis Volume [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	60	0	0	0	0	0	31	50	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21		13	81	64	64
g / C, Green / Cycle	0.19	0.19	0.19		0.12	0.74	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.15		0.10	0.16	0.27	0.29
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	341	341	341		212	2804	1109	1051
d1, Uniform Delay [s]	42.86	42.63	42.39		47.47	4.51	13.06	13.33
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.20	4.49	3.88		8.35	0.18	1.39	1.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.78		0.84	0.22	0.46	0.49
d, Delay for Lane Group [s/veh]	48.06	47.13	46.26		55.82	4.69	14.45	14.96
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.83	7.51	7.19		5.22	1.95	7.36	7.55
50th-Percentile Queue Length [ft/ln]	195.79	187.85	179.66		130.43	48.77	183.93	188.72
95th-Percentile Queue Length [veh/ln]	12.42	12.01	11.58		8.96	3.51	11.81	12.05
95th-Percentile Queue Length [ft/ln]	310.52	300.24	289.58		224.08	87.78	295.14	301.37

**Movement, Approach, & Intersection Results**

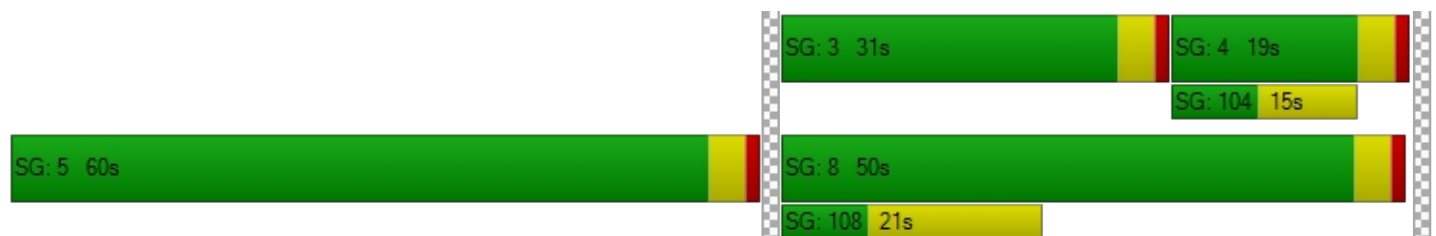
d_M, Delay for Movement [s/veh]	47.73	0.00	46.53	0.00	0.00	0.00	55.82	4.69	0.00	0.00	14.67	14.96
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	47.17			0.00			16.11			14.71		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	25.24											
Intersection LOS	C											
Intersection V/C	0.607											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.217	1.744	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	836	273
d_b, Bicycle Delay [s]	55.00	55.00	18.62	41.02
I_b,int, Bicycle LOS Score for Intersection	5.490	4.132	2.213	2.408
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	6.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.233

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	31	569	28	11	623	18	13	19	32	32	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	569	28	11	623	18	13	19	32	32	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	142	7	3	156	5	3	5	8	8	4	7
Total Analysis Volume [veh/h]	31	569	28	11	623	18	13	19	32	32	17	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	96	96	96	96	96	96	6	6
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.16	0.16	0.01	0.17	0.17	0.04	0.04
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1534	1656	1569	1538	1656	1569	139	146
d1, Uniform Delay [s]	0.92	1.08	1.08	0.91	1.09	1.09	50.80	51.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.25	0.26	0.01	0.27	0.28	2.35	2.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.19	0.18	0.01	0.20	0.20	0.46	0.52
d, Delay for Lane Group [s/veh]	0.94	1.33	1.33	0.92	1.36	1.37	53.16	53.99
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.04	0.49	0.46	0.01	0.54	0.51	1.81	2.18
50th-Percentile Queue Length [ft/ln]	1.07	12.32	11.61	0.37	13.38	12.70	45.35	54.38
95th-Percentile Queue Length [veh/ln]	0.08	0.89	0.84	0.03	0.96	0.91	3.26	3.92
95th-Percentile Queue Length [ft/ln]	1.92	22.17	20.89	0.67	24.08	22.85	81.62	97.88



**Movement, Approach, & Intersection Results**

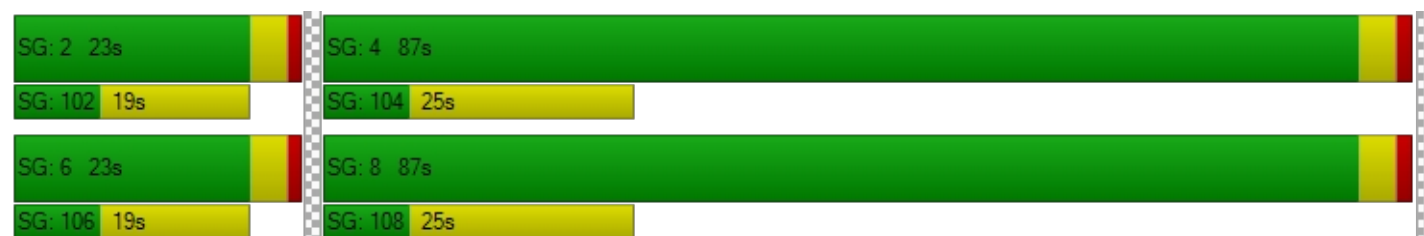
d_M, Delay for Movement [s/veh]	0.94	1.33	1.33	0.92	1.37	1.37	53.16	53.16	53.16	53.99	53.99	53.99
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.31			1.36			53.16			53.99		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.49											
Intersection LOS	A											
Intersection V/C	0.233											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.611			2.574			1.832			1.805		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.078			2.098			1.665			1.685		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	77	1043	108	106	860	182	185	402	85	127	428	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1043	108	106	860	182	185	402	85	127	428	196
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	261	27	27	215	46	46	101	21	32	107	49
Total Analysis Volume [veh/h]	77	1043	108	106	860	182	185	402	85	127	428	196
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	43	0	24	57	0	15	33	0	10	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	45	35	35	45	35	35	57	47	47	57	45	45
g / C, Green / Cycle	0.41	0.32	0.32	0.41	0.32	0.32	0.52	0.43	0.43	0.52	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.06	0.06	0.29	0.27	0.10	0.11	0.05	0.07	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	336	1207	572	369	613	581	889	1619	767	904	1539	729
d1, Uniform Delay [s]	20.10	35.32	27.26	20.44	35.57	34.73	14.21	20.28	19.03	13.72	21.96	21.87
k, delay calibration	0.11	0.11	0.11	0.11	0.17	0.14	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.34	1.99	0.16	0.43	7.51	4.48	0.11	0.37	0.29	0.33	0.45	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.86	0.19	0.29	0.90	0.85	0.21	0.25	0.11	0.14	0.28	0.27
d, Delay for Lane Group [s/veh]	20.44	37.31	27.42	20.87	43.08	39.20	14.33	20.64	19.32	14.05	22.41	22.77
Lane Group LOS	C	D	C	C	D	D	B	C	B	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.25	13.26	2.09	1.76	15.11	12.76	2.47	3.37	1.37	1.70	3.78	3.54
50th-Percentile Queue Length [ft/ln]	31.36	331.38	52.27	43.88	377.83	318.88	61.63	84.33	34.21	42.42	94.54	88.61
95th-Percentile Queue Length [veh/ln]	2.26	19.23	3.76	3.16	21.49	18.61	4.44	6.07	2.46	3.05	6.81	6.38
95th-Percentile Queue Length [ft/ln]	56.46	480.65	94.08	78.99	537.22	465.31	110.94	151.80	61.58	76.35	170.17	159.50

**Movement, Approach, & Intersection Results**

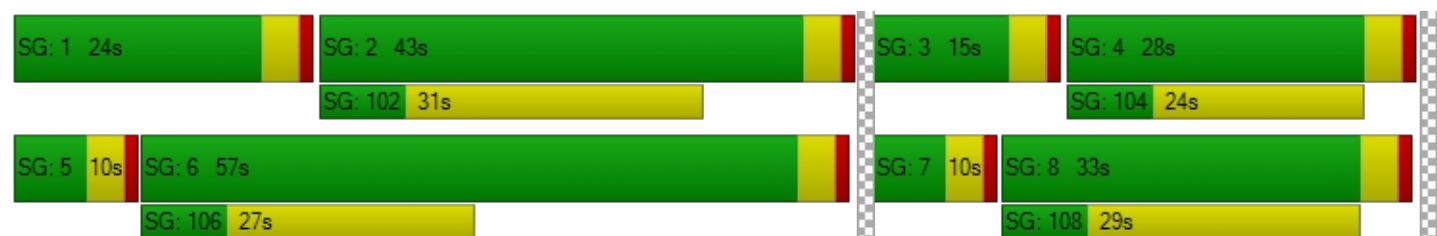
d_M, Delay for Movement [s/veh]	20.44	37.31	27.42	20.87	41.69	39.20	14.33	20.64	19.32	14.05	22.41	22.77
Movement LOS	C	D	C	C	D	D	B	C	B	B	C	C
d_A, Approach Delay [s/veh]	35.38			39.37			18.74			21.09		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	30.82											
Intersection LOS	C											
Intersection V/C	0.573											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.917			2.922			2.721			2.735		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			964			527			436		
d_b, Bicycle Delay [s]	22.91			14.77			29.82			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.573			2.507			2.114			2.179		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.515

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	127	531	193	45	622	65	58	492	122	238	495	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	531	193	45	622	65	58	492	122	238	495	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	133	48	11	156	16	15	123	31	60	124	10
Total Analysis Volume [veh/h]	127	531	193	45	622	65	58	492	122	238	495	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	56	0	14	44	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	27	27	36	24	24	5	53	53	10	57	57
g / C, Green / Cycle	0.32	0.25	0.25	0.32	0.22	0.22	0.05	0.48	0.48	0.09	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.07	0.14	0.11	0.03	0.19	0.18	0.03	0.13	0.07	0.07	0.13	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	356	933	442	462	412	390	83	1810	858	318	1980	938
d1, Uniform Delay [s]	27.09	36.42	35.09	25.83	41.62	41.31	51.75	17.34	16.19	48.81	14.52	12.90
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.61	0.55	0.68	0.09	5.75	4.97	10.02	0.37	0.35	3.51	0.30	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.57	0.44	0.10	0.87	0.84	0.70	0.27	0.14	0.75	0.25	0.04
d, Delay for Lane Group [s/veh]	27.70	36.97	35.77	25.92	47.36	46.29	61.77	17.71	16.54	52.33	14.82	12.99
Lane Group LOS	C	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.49	6.30	4.45	0.83	9.96	9.01	1.81	3.79	1.80	3.34	3.42	0.49
50th-Percentile Queue Length [ft/ln]	62.33	157.48	111.15	20.84	249.01	225.26	45.17	94.85	44.92	83.41	85.50	12.23
95th-Percentile Queue Length [veh/ln]	4.49	10.42	7.90	1.50	15.14	13.93	3.25	6.83	3.23	6.01	6.16	0.88
95th-Percentile Queue Length [ft/ln]	112.19	260.39	197.60	37.51	378.41	348.33	81.31	170.74	80.86	150.14	153.89	22.01



**Movement, Approach, & Intersection Results**

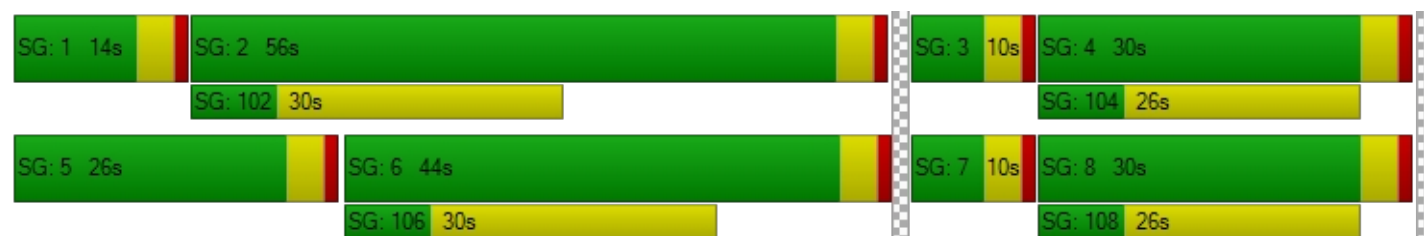
d_M, Delay for Movement [s/veh]	27.70	36.97	35.77	25.92	46.91	46.29	61.77	17.71	16.54	52.33	14.82	12.99
Movement LOS	C	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	35.32			45.56			21.30			26.29		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	32.38											
Intersection LOS	C											
Intersection V/C	0.515											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.760			2.575			2.726			2.830		
Crosswalk LOS	C			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			727			473			473		
d_b, Bicycle Delay [s]	15.29			22.27			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.262			2.164			2.114			2.197		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	55	1132	33	38	1344	38	62	79	87	70	109	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	1132	33	38	1344	38	62	79	87	70	109	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	283	8	10	336	10	16	20	22	18	27	8
Total Analysis Volume [veh/h]	55	1132	33	38	1344	38	62	79	87	70	109	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	64	0	0	64	0	0	46	0	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.32	0.31	0.02	0.37	0.37	0.13	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1186	1486	1408	1240	1486	1408	303	78	261
d1, Uniform Delay [s]	2.69	3.81	3.80	2.66	4.17	4.15	45.89	41.70	43.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.82	0.85	0.05	1.11	1.15	3.78	26.53	1.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.40	0.40	0.03	0.48	0.48	0.75	0.89	0.54
d, Delay for Lane Group [s/veh]	2.76	4.63	4.65	2.71	5.28	5.31	49.67	68.23	45.27
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.24	3.66	3.44	0.16	4.77	4.48	6.37	2.27	3.70
50th-Percentile Queue Length [ft/ln]	5.97	91.53	85.92	4.06	119.14	112.03	159.27	56.67	92.55
95th-Percentile Queue Length [veh/ln]	0.43	6.59	6.19	0.29	8.35	7.95	10.51	4.08	6.66
95th-Percentile Queue Length [ft/ln]	10.74	164.75	154.66	7.31	208.64	198.82	262.75	102.00	166.58

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	2.76	4.64	4.65	2.71	5.29	5.31	49.67	49.67	49.67	68.23	45.27	45.27
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.56			5.22			49.67			52.85		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.53											
Intersection LOS	B											
Intersection V/C	0.541											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.940			2.914			2.012			2.121		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1091			1091			764			764		
d_b, Bicycle Delay [s]	11.36			11.36			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.566			2.731			1.936			1.909		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 2 64s

SG: 4 46s

SG: 102 21s

SG: 104 25s

SG: 6 64s

SG: 8 46s

SG: 106 18s

SG: 108 27s

### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.395

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	94	821	61	49	899	44	51	38	79	120	35	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	821	61	49	899	44	51	38	79	120	35	41
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	205	15	12	225	11	13	10	20	30	9	10
Total Analysis Volume [veh/h]	94	821	61	49	899	44	51	38	79	120	35	41
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.05	0.24	0.24	0.03	0.26	0.25	0.09	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1336	1520	1440	1346	1520	1440	272	282
d1, Uniform Delay [s]	2.32	2.89	2.87	2.26	2.95	2.94	46.15	46.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.51	0.52	0.05	0.56	0.58	2.29	3.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.30	0.29	0.04	0.32	0.32	0.62	0.70
d, Delay for Lane Group [s/veh]	2.42	3.40	3.39	2.31	3.51	3.51	48.44	50.05
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.36	2.17	2.00	0.18	2.36	2.19	4.58	5.47
50th-Percentile Queue Length [ft/ln]	8.95	54.13	49.88	4.54	58.90	54.84	114.39	136.70
95th-Percentile Queue Length [veh/ln]	0.64	3.90	3.59	0.33	4.24	3.95	8.08	9.30
95th-Percentile Queue Length [ft/ln]	16.10	97.43	89.78	8.16	106.03	98.72	202.09	232.57



**Movement, Approach, & Intersection Results**

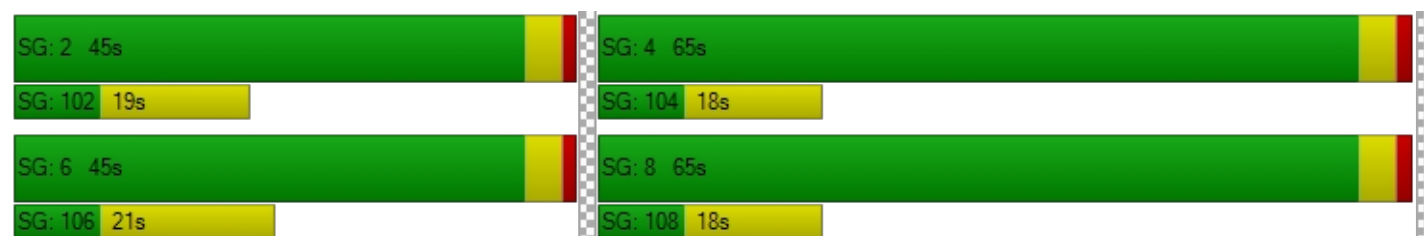
d_M, Delay for Movement [s/veh]	2.42	3.40	3.39	2.31	3.51	3.51	48.44	48.44	48.44	50.05	50.05	50.05
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.30			3.45			48.44			50.05		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.55											
Intersection LOS	B											
Intersection V/C	0.395											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.885			2.753			2.024			1.962		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.365			2.378			1.837			1.883		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	39.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	200	1119	256	256	1164	203	248	734	307	244	815	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	1119	256	256	1164	203	248	734	307	244	815	217
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	280	64	64	291	51	62	184	77	61	204	54
Total Analysis Volume [veh/h]	200	1119	256	256	1164	203	248	734	307	244	815	217
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	39	0	13	41	0	21	39	0	19	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	34	34	9	36	36	17	35	35	16	34	34
g / C, Green / Cycle	0.06	0.31	0.31	0.08	0.33	0.33	0.15	0.32	0.32	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.14	0.07	0.30	0.14	0.14	0.13	0.17	0.14	0.14	0.12
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1187	562	287	1256	595	277	1805	570	259	1747	552
d1, Uniform Delay [s]	51.14	36.87	30.32	50.03	35.00	28.52	45.67	29.48	30.97	46.65	30.87	30.08
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.08	4.59	0.58	9.50	2.49	0.45	9.91	0.68	3.63	15.48	0.90	2.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.94	0.46	0.89	0.89	0.41	0.90	0.41	0.54	0.94	0.47	0.39
d, Delay for Lane Group [s/veh]	63.23	41.46	30.90	59.53	37.48	28.97	55.58	30.17	34.60	62.13	31.77	32.18
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.10	15.13	5.50	3.85	14.44	5.03	7.37	5.16	7.23	7.69	5.95	4.84
50th-Percentile Queue Length [ft/ln]	77.57	378.25	137.49	96.36	360.94	125.86	184.25	129.06	180.69	192.26	148.72	120.99
95th-Percentile Queue Length [veh/ln]	5.58	21.51	9.35	6.94	20.67	8.71	11.82	8.89	11.64	12.24	9.95	8.45
95th-Percentile Queue Length [ft/ln]	139.62	537.73	233.63	173.45	516.72	217.85	295.56	222.22	290.91	305.96	248.73	211.18

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.23	41.46	30.90	59.53	37.18	28.97	55.58	30.17	34.60	62.13	31.77	32.18
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	42.51			39.68			36.11			37.64		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.20											
Intersection LOS	D											
Intersection V/C	0.788											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.136			3.050			3.041			3.042		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			673			636			600		
d_b, Bicycle Delay [s]	25.57			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.859			2.452			2.269			2.261		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	292	830	118	172	831	166	191	698	268	197	636	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	292	830	118	172	831	166	191	698	268	197	636	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	208	30	43	208	42	48	175	67	49	159	42
Total Analysis Volume [veh/h]	292	830	118	172	831	166	191	698	268	197	636	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	45	0	21	53	0	10	32	0	12	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	28	28	42	29	29	14	48	48	9	43	43
g / C, Green / Cycle	0.38	0.26	0.26	0.38	0.26	0.26	0.12	0.43	0.43	0.08	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.16	0.22	0.07	0.10	0.22	0.09	0.11	0.18	0.15	0.06	0.22	0.21
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	411	979	464	410	992	470	225	1646	780	273	733	695
d1, Uniform Delay [s]	25.27	38.81	32.46	23.41	38.48	33.12	47.13	21.67	20.78	49.59	26.78	26.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.28	2.14	0.29	0.69	1.97	0.45	8.55	0.80	1.20	3.58	3.37	3.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.71	0.85	0.25	0.42	0.84	0.35	0.85	0.42	0.34	0.72	0.58	0.54
d, Delay for Lane Group [s/veh]	27.55	40.95	32.75	24.10	40.45	33.57	55.68	22.47	21.99	53.17	30.14	29.23
Lane Group LOS	C	D	C	C	D	C	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.87	10.81	2.54	3.14	10.75	3.66	5.63	6.35	4.80	2.78	9.44	8.11
50th-Percentile Queue Length [ft/ln]	146.71	270.32	63.48	78.45	268.87	91.59	140.86	158.72	120.04	69.44	235.91	202.69
95th-Percentile Queue Length [veh/ln]	9.84	16.21	4.57	5.65	16.13	6.59	9.53	10.48	8.40	5.00	14.47	12.78
95th-Percentile Queue Length [ft/ln]	246.02	405.14	114.26	141.20	403.33	164.86	238.18	262.02	209.88	124.99	361.86	319.44



**Movement, Approach, & Intersection Results**

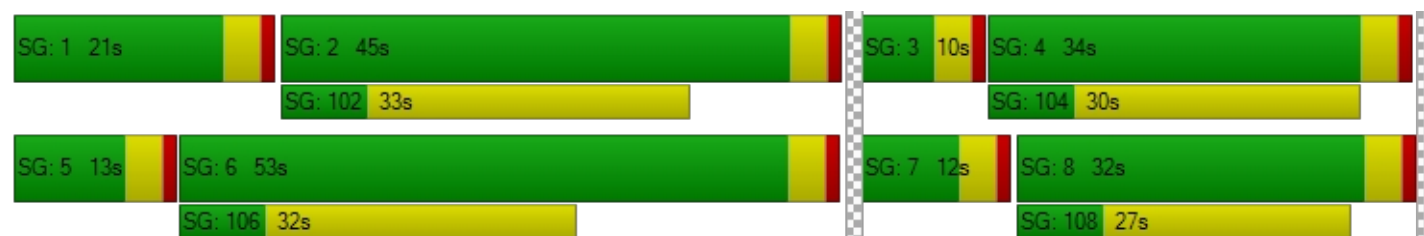
d_M, Delay for Movement [s/veh]	27.55	40.95	32.75	24.10	40.45	33.57	55.68	22.47	21.99	53.17	29.84	29.23
Movement LOS	C	D	C	C	D	C	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	37.02			37.07			27.84			34.34		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	34.12											
Intersection LOS	C											
Intersection V/C	0.780											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.875			2.845			2.944			2.948		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			891			509			545		
d_b, Bicycle Delay [s]	21.64			16.91			30.56			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.583			2.524			2.196			2.385		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 22: Harbor Boulevard at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	396	0	0	342	167	0	0	0	54	87	88
Total Analysis Volume [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	69	59	59		23	23	23
g / C, Green / Cycle	0.06	0.69	0.59	0.59		0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.36	0.38		0.12	0.09	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3926	2244	1063		416	879	416
d1, Uniform Delay [s]	45.81	6.71	13.03	13.44		33.56	32.53	36.76
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.31	1.21	2.92		0.99	0.29	4.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.40	0.60	0.64		0.52	0.40	0.85
d, Delay for Lane Group [s/veh]	48.11	7.02	14.24	16.37		34.56	32.82	41.63
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	4.32	9.30	10.07		4.63	3.57	8.67
50th-Percentile Queue Length [ft/ln]	35.31	108.12	232.54	251.74		115.63	89.34	216.86
95th-Percentile Queue Length [veh/ln]	2.54	7.74	14.30	15.27		8.15	6.43	13.50
95th-Percentile Queue Length [ft/ln]	63.56	193.39	357.58	381.84		203.80	160.81	337.61

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.11	7.02	0.00	0.00	14.26	16.37	0.00	0.00	0.00	34.56	32.82	41.63
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	9.73			14.95			0.00			36.62		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.32											
Intersection LOS	B											
Intersection V/C	0.687											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.269			2.359		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.492			2.677			4.132			2.315		
Bicycle LOS	B			B			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	27.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.840

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	211	0	0	280	80	0	0	0	33	133	187
Total Analysis Volume [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	34	0	0	23	0	0	0	0	0	66	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	47	36	36		45	45	45
g / C, Green / Cycle	0.07	0.47	0.36	0.36		0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.25	0.27		0.19	0.17	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	2660	1353	641		816	861	816
d1, Uniform Delay [s]	45.74	16.69	27.76	28.29		18.37	18.06	25.60
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.31	3.18	7.85		0.33	0.28	8.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.32	0.71	0.75		0.41	0.38	0.92
d, Delay for Lane Group [s/veh]	56.22	17.00	30.93	36.13		18.70	18.33	34.57
Lane Group LOS	E	B	C	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	4.01	10.23	11.21		5.15	4.93	17.82
50th-Percentile Queue Length [ft/ln]	70.64	100.28	255.71	280.31		128.77	123.31	445.38
95th-Percentile Queue Length [veh/ln]	5.09	7.22	15.47	16.70		8.87	8.57	24.74
95th-Percentile Queue Length [ft/ln]	127.15	180.51	386.84	417.60		221.82	214.37	618.44



**Movement, Approach, & Intersection Results**

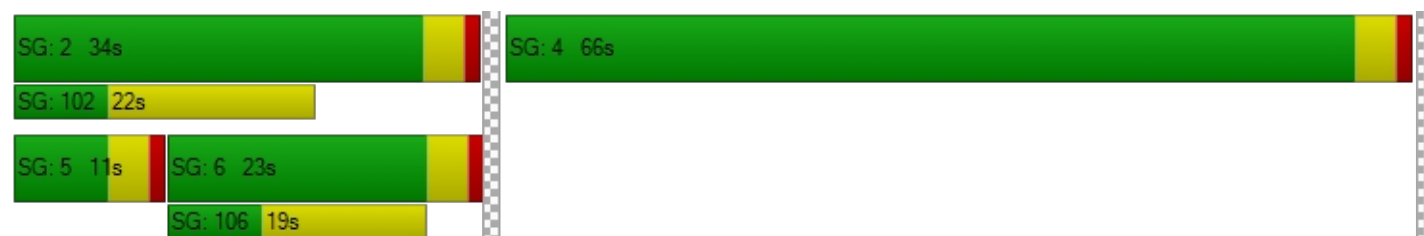
d_M, Delay for Movement [s/veh]	56.22	17.00	0.00	0.00	31.67	36.13	0.00	0.00	0.00	18.70	18.48	34.57
Movement LOS	E	B			C	D				B	B	C
d_A, Approach Delay [s/veh]	21.20			32.67			0.00			27.03		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	27.72											
Intersection LOS	C											
Intersection V/C	0.840											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.185			2.404		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			380			0			1240		
d_b, Bicycle Delay [s]	24.50			32.81			50.00			7.22		
I_b,int, Bicycle LOS Score for Intersection	2.079			2.352			4.132			2.725		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	246	68	122	282	0	203	51	45	0	0	0
Total Analysis Volume [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	28	57	0	0	43	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	44	44	17	65	27	27	27	
g / C, Green / Cycle	0.44	0.44	0.17	0.65	0.27	0.27	0.27	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.15	0.14	0.20	0.23	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2523	797	578	3693	952	517	490	
d1, Uniform Delay [s]	18.78	18.30	40.48	7.73	34.47	29.64	29.42	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.46	1.17	3.43	0.21	2.25	0.48	0.46	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.39	0.34	0.84	0.30	0.85	0.39	0.37	
d, Delay for Lane Group [s/veh]	19.23	19.46	43.91	7.94	36.72	30.13	29.87	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.11	4.29	6.02	3.30	9.43	3.99	3.51	
50th-Percentile Queue Length [ft/ln]	127.63	107.34	150.49	82.47	235.81	99.69	87.70	
95th-Percentile Queue Length [veh/ln]	8.81	7.69	10.04	5.94	14.47	7.18	6.31	
95th-Percentile Queue Length [ft/ln]	220.27	192.29	251.08	148.45	361.73	179.44	157.86	

**Movement, Approach, & Intersection Results**

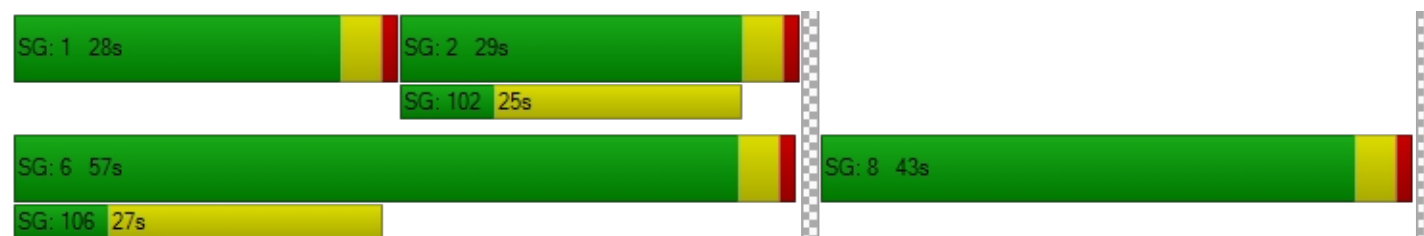
d_M, Delay for Movement [s/veh]	0.00	19.23	19.46	43.91	7.94	0.00	36.72	30.13	29.87	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	19.28			18.80			34.57			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	23.57											
Intersection LOS	C											
Intersection V/C	0.617											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.426			2.188		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1060			780			0		
d_b, Bicycle Delay [s]	28.13			11.05			18.61			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.251			2.447			3.525			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	157	42	147	186	0	47	186	16	0	0	0
Total Analysis Volume [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	40	40	19	63	29	29	29	
g / C, Green / Cycle	0.40	0.40	0.19	0.63	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.17	0.20	0.26	0.24	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1508	714	662	2379	529	559	529	
d1, Uniform Delay [s]	21.15	21.34	39.49	8.70	33.73	32.89	25.81	
k, delay calibration	0.50	0.50	0.11	0.50	0.13	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.48	4.23	0.34	6.03	3.13	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.35	0.37	0.89	0.31	0.89	0.82	0.12	
d, Delay for Lane Group [s/veh]	21.79	22.82	43.72	9.04	39.76	36.03	25.91	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.41	4.61	7.31	3.59	11.52	10.65	1.09	
50th-Percentile Queue Length [ft/ln]	110.32	115.26	182.87	89.77	288.02	266.14	27.21	
95th-Percentile Queue Length [veh/ln]	7.86	8.13	11.75	6.46	17.09	16.00	1.96	
95th-Percentile Queue Length [ft/ln]	196.45	203.29	293.76	161.58	427.19	399.91	48.98	



**Movement, Approach, & Intersection Results**

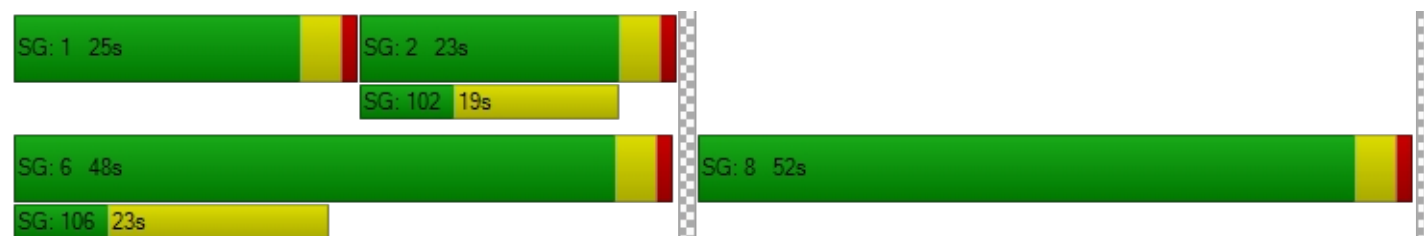
d_M, Delay for Movement [s/veh]	0.00	21.95	22.82	43.72	9.04	0.00	39.76	37.45	25.91	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.14			24.33			37.16			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.85											
Intersection LOS	C											
Intersection V/C	0.655											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.267			2.451		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.997			2.659			2.378			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	40	313	11	4	511
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	40	313	11	4	511
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	10	78	3	1	128
Total Analysis Volume [veh/h]	0	40	313	11	4	511
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**



V/C, Movement V/C Ratio	0.00	0.05	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	10.24	0.00	0.00	7.92	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.17	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	4.36	0.00	0.00	0.24	0.00
d_A, Approach Delay [s/veh]	10.24		0.00		0.06	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.50					
Intersection LOS	B					

### Intersection Level Of Service Report

#### Intersection 27: Lemon Street at Fullerton College Drive

Control Type:	Signalized	Delay (sec / veh):	14.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

#### Intersection Setup

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	447	45	17	402	0	30	0	62	107	0	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	447	45	17	402	0	30	0	62	107	0	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	112	11	4	101	0	8	0	16	27	0	11
Total Analysis Volume [veh/h]	0	447	45	17	402	0	30	0	62	107	0	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	47	0	10	57	0	0	53	0	53	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	87	87	93	93	9	9	9	9
g / C, Green / Cycle	0.79	0.79	0.85	0.85	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.01	0.11	0.02	0.03	0.06	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1501	1422	1558	3226	175	174	117	141
d1, Uniform Delay [s]	2.78	2.81	1.27	1.40	47.52	48.39	49.68	47.92
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	0.26	0.00	0.08	0.46	1.24	22.73	1.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.16	0.17	0.01	0.12	0.17	0.36	0.92	0.32
d, Delay for Lane Group [s/veh]	3.02	3.07	1.27	1.48	47.98	49.63	72.41	49.22
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.09	1.11	0.03	0.42	0.79	1.68	3.61	1.22
50th-Percentile Queue Length [ft/ln]	27.31	27.68	0.77	10.58	19.84	42.08	90.34	30.44
95th-Percentile Queue Length [veh/ln]	1.97	1.99	0.06	0.76	1.43	3.03	6.50	2.19
95th-Percentile Queue Length [ft/ln]	49.15	49.82	1.39	19.05	35.71	75.74	162.61	54.78

**Movement, Approach, & Intersection Results**

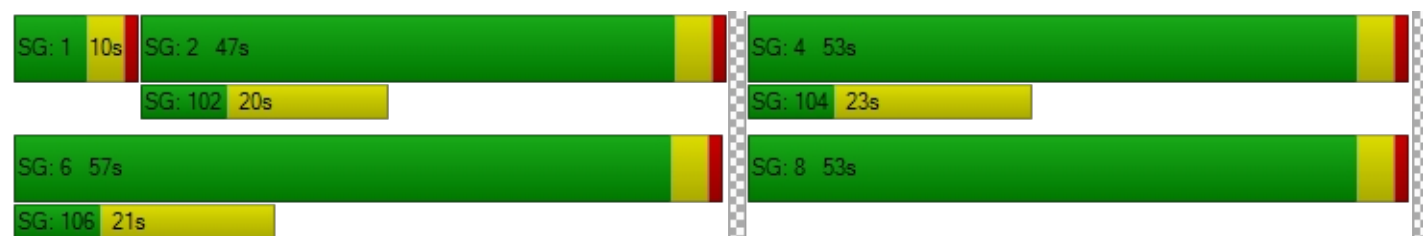
d_M, Delay for Movement [s/veh]	0.00	3.04	3.07	1.27	1.48	0.00	47.98	49.63	49.63	72.41	0.00	49.22
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	3.04			1.47			49.09			65.54		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.37											
Intersection LOS	B											
Intersection V/C	0.222											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.536			1.769			2.039		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			964			891			0		
d_b, Bicycle Delay [s]	20.40			14.77			16.91			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.966			1.905			1.711			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.047

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	0	384	271	1	28	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	384	271	1	28	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	96	68	0	7	1
Total Analysis Volume [veh/h]	0	384	271	1	28	4
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.05	0.01
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	11.39	10.02
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	4.14	4.14
d_A, Approach Delay [s/veh]	0.00		0.00		11.22	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	41	379	279	1	8	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	379	279	1	8	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	95	70	0	2	25
Total Analysis Volume [veh/h]	41	379	279	1	8	100
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.01	0.13
d_M, Delay for Movement [s/veh]	7.90	0.00	0.00	0.00	12.51	10.58
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.10	0.00	0.00	0.00	0.51	0.51
95th-Percentile Queue Length [ft/ln]	2.48	0.00	0.00	0.00	12.79	12.79
d_A, Approach Delay [s/veh]	0.77		0.00		10.72	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.83					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.054

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	399	33	22	286	30	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	399	33	22	286	30	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	8	6	72	8	5
Total Analysis Volume [veh/h]	399	33	22	286	30	18
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	8.26	0.00	12.06	11.21
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.27	0.27
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.49	0.00	6.71	6.71
d_A, Approach Delay [s/veh]	0.00		0.59		11.74	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.95					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.056

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	481	12	0	402	6	0	0	28	0	0	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	481	12	0	402	6	0	0	28	0	0	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	120	3	0	101	2	0	0	7	0	0	11
Total Analysis Volume [veh/h]	6	481	12	0	402	6	0	0	28	0	0	42
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.06
d_M, Delay for Movement [s/veh]	8.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.65	0.00	0.00	10.06
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.18
95th-Percentile Queue Length [ft/ln]	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.71	0.00	0.00	4.42
d_A, Approach Delay [s/veh]	0.10			0.00			9.65			10.06		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	0.76											
Intersection LOS	B											

*APPENDIX B-III*

EXISTING SATURDAY DEPARTURE PEAK HOUR  
TRAFFIC CONDITIONS







### Intersection Level Of Service Report

#### Intersection 1: Harbor Boulevard at Bastanchury Road

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.409

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	96	532	67	164	484	156	159	656	85	146	681	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	532	67	164	484	156	159	656	85	146	681	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	133	17	41	121	39	40	164	21	37	170	41
Total Analysis Volume [veh/h]	96	532	67	164	484	156	159	656	85	146	681	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	16	44	0	14	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	59	59	6	60	60	12	22	22	7	17	17
g / C, Green / Cycle	0.05	0.54	0.54	0.05	0.54	0.54	0.10	0.20	0.20	0.06	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.04	0.05	0.11	0.11	0.09	0.13	0.14	0.04	0.12	0.09
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	184	3069	969	194	2057	974	189	762	361	211	888	281
d1, Uniform Delay [s]	50.81	12.93	12.18	51.54	13.08	13.08	48.37	40.44	40.77	50.74	44.55	43.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.29	0.12	0.14	9.71	0.23	0.49	9.61	0.93	2.29	4.04	1.42	1.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.17	0.07	0.85	0.21	0.21	0.84	0.65	0.68	0.69	0.77	0.59
d, Delay for Lane Group [s/veh]	53.10	13.06	12.32	61.25	13.31	13.57	57.98	41.37	43.05	54.78	45.97	45.15
Lane Group LOS	D	B	B	E	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.35	2.22	0.82	2.50	2.79	2.72	4.78	6.22	6.39	2.09	6.03	4.32
50th-Percentile Queue Length [ft/ln]	33.66	55.62	20.41	62.47	69.71	67.94	119.38	155.57	159.87	52.20	150.69	107.94
95th-Percentile Queue Length [veh/ln]	2.42	4.00	1.47	4.50	5.02	4.89	8.36	10.31	10.54	3.76	10.05	7.73
95th-Percentile Queue Length [ft/ln]	60.58	100.11	36.73	112.44	125.47	122.29	208.97	257.84	263.55	93.96	251.35	193.14

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	53.10	13.06	12.32	61.25	13.34	13.57	57.98	41.79	43.05	54.78	45.97	45.15
Movement LOS	D	B	B	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	18.52			23.16			44.77			47.13		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	34.95											
Intersection LOS	C											
Intersection V/C	0.409											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.012			2.937			2.859			3.062		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			727			691		
d_b, Bicycle Delay [s]	23.56			23.56			22.27			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.942			2.002			2.055			2.105		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.441

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	18	629	514	50	702	20	36	97	15	516	67	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	629	514	50	702	20	36	97	15	516	67	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	157	129	13	176	5	9	24	4	129	17	0
Total Analysis Volume [veh/h]	18	629	514	50	702	20	36	97	15	516	67	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	61	5	63	63	8	8	8	21	21
g / C, Green / Cycle	0.02	0.55	0.04	0.57	0.57	0.07	0.07	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.11	0.03	0.15	0.08	0.02	0.05	0.01	0.16	0.16
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	43	3139	79	2167	1026	128	135	128	341	341
d1, Uniform Delay [s]	52.95	12.50	51.79	12.00	11.04	48.48	50.06	47.91	43.12	43.21
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.19	0.14	8.23	0.30	0.28	1.19	6.98	0.40	5.98	6.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.20	0.64	0.27	0.14	0.28	0.72	0.12	0.85	0.86
d, Delay for Lane Group [s/veh]	59.14	12.64	60.01	12.31	11.32	49.67	57.04	48.31	49.10	49.57
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.56	2.59	1.54	3.59	1.65	0.98	2.87	0.40	8.14	8.27
50th-Percentile Queue Length [ft/ln]	14.12	64.80	38.39	89.80	41.29	24.50	71.77	10.01	203.43	206.73
95th-Percentile Queue Length [veh/ln]	1.02	4.67	2.76	6.47	2.97	1.76	5.17	0.72	12.82	12.99
95th-Percentile Queue Length [ft/ln]	25.42	116.63	69.10	161.65	74.31	44.09	129.19	18.02	320.39	324.63

**Movement, Approach, & Intersection Results**

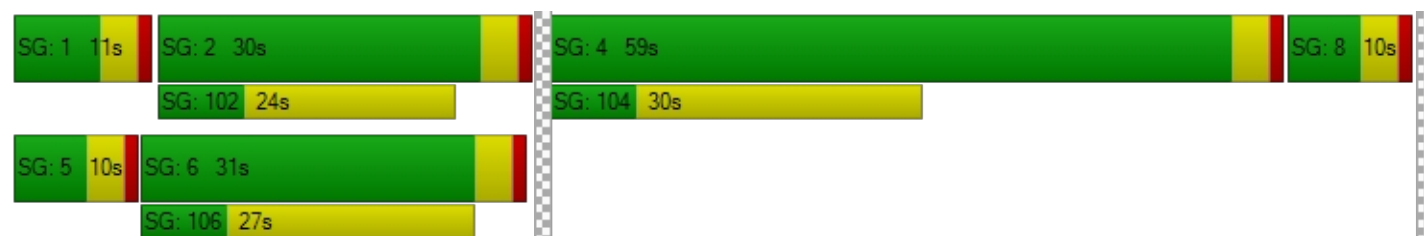
d_M, Delay for Movement [s/veh]	59.14	12.64	0.00	60.01	12.14	11.32	49.67	57.04	48.31	49.31	49.57	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	13.93			15.22			54.36			49.34		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.78											
Intersection LOS	C											
Intersection V/C	0.441											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	2.804	2.202	2.187
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	473	491	109	1000
d_b, Bicycle Delay [s]	32.07	31.31	49.16	13.75
I_b,int, Bicycle LOS Score for Intersection	1.915	1.984	1.804	2.522
Bicycle LOS	A	A	A	B

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	16.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	65	973	34	125	1097	14	31	64	65	45	92	203
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	973	34	125	1097	14	31	64	65	45	92	203
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	243	9	31	274	4	8	16	16	11	23	51
Total Analysis Volume [veh/h]	65	973	34	125	1097	14	31	64	65	45	92	203
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	12	62	0	11	61	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	77	77	7	79	79	14	14	14	14	14	25
g / C, Green / Cycle	0.05	0.70	0.70	0.06	0.72	0.72	0.12	0.12	0.12	0.12	0.12	0.22
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.04	0.29	0.01	0.02	0.03	0.04	0.03	0.05	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	88	1335	1264	229	2732	1294	179	234	222	203	234	405
d1, Uniform Delay [s]	51.60	6.70	6.67	49.80	6.10	4.38	43.01	43.74	43.85	43.35	44.42	37.23
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.47	0.86	0.89	2.03	0.44	0.02	0.46	0.63	0.73	0.54	1.07	0.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.74	0.39	0.39	0.55	0.40	0.01	0.17	0.27	0.29	0.22	0.39	0.50
d, Delay for Lane Group [s/veh]	63.07	7.56	7.56	51.84	6.55	4.39	43.47	44.37	44.58	43.90	45.49	38.20
Lane Group LOS	E	A	A	D	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.05	4.75	4.44	1.73	4.55	0.09	0.78	1.62	1.66	1.13	2.38	4.87
50th-Percentile Queue Length [ft/ln]	51.17	118.74	111.02	43.25	113.71	2.14	19.41	40.58	41.40	28.34	59.50	121.77
95th-Percentile Queue Length [veh/ln]	3.68	8.32	7.90	3.11	8.05	0.15	1.40	2.92	2.98	2.04	4.28	8.49
95th-Percentile Queue Length [ft/ln]	92.10	208.09	197.42	77.84	201.15	3.85	34.94	73.04	74.52	51.01	107.10	212.25

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.07	7.56	7.56	51.84	6.55	4.39	43.47	44.37	44.58	43.90	45.49	38.20
Movement LOS	E	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.93			11.10			44.28			40.93		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	16.54											
Intersection LOS	B											
Intersection V/C	0.481											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.818			2.988			2.221			2.419		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1055			1036			600			600		
d_b, Bicycle Delay [s]	12.29			12.77			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.444			2.579			1.824			2.121		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	127	192	41	61	220	27	16	165	83	55	192	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	192	41	61	220	27	16	165	83	55	192	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	48	10	15	55	7	4	41	21	14	48	15
Total Analysis Volume [veh/h]	127	192	41	61	220	27	16	165	83	55	192	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	36	0	0	44	0	0	30	30	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	12	12	59	12	12	12
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.39	0.11	0.11	0.54	0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.02	0.03	0.14	0.01	0.09	0.05	0.03	0.07	0.07
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	704	704	704	704	704	122	207	965	90	207	196
d1, Uniform Delay [s]	21.93	22.82	20.86	21.10	23.63	44.00	47.76	12.38	44.99	46.89	46.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.56	0.96	0.16	0.24	1.38	0.48	6.84	0.18	6.55	3.29	3.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.27	0.06	0.09	0.35	0.13	0.80	0.09	0.61	0.64	0.61
d, Delay for Lane Group [s/veh]	22.49	23.77	21.02	21.34	25.00	44.49	54.60	12.56	51.54	50.18	49.80
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.26	3.56	0.69	1.04	4.77	0.41	4.79	1.03	1.54	3.67	3.30
50th-Percentile Queue Length [ft/ln]	56.40	89.07	17.25	25.98	119.14	10.23	119.81	25.73	38.62	91.68	82.53
95th-Percentile Queue Length [veh/ln]	4.06	6.41	1.24	1.87	8.35	0.74	8.38	1.85	2.78	6.60	5.94
95th-Percentile Queue Length [ft/ln]	101.52	160.32	31.05	46.76	208.65	18.42	209.56	46.31	69.52	165.02	148.56

**Movement, Approach, & Intersection Results**

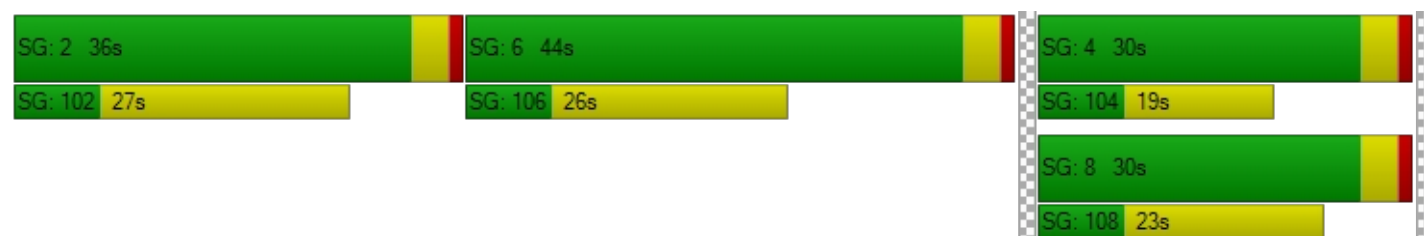
d_M, Delay for Movement [s/veh]	22.49	23.77	21.02	21.34	25.00	25.00	44.49	54.60	12.56	51.54	50.06	49.80
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	23.01			24.28			40.77			50.28		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.88											
Intersection LOS	C											
Intersection V/C	0.371											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.394			2.160			2.428			2.281		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			727			473			473		
d_b, Bicycle Delay [s]	27.65			22.27			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.154			2.068			1.995			1.814		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.188

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	124	92	200	175	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	124	92	200	175	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	31	23	50	44	3
Total Analysis Volume [veh/h]	16	124	92	200	175	11
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.11	0.09	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	158	158	1499	1595	1595	1511
d1, Uniform Delay [s]	46.12	49.09	1.49	1.58	1.56	1.42
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	8.33	0.08	0.16	0.14	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.06	0.13	0.11	0.01
d, Delay for Lane Group [s/veh]	46.40	57.42	1.57	1.74	1.70	1.43
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.42	3.69	0.23	0.52	0.45	0.03
50th-Percentile Queue Length [ft/ln]	10.38	92.26	5.70	13.06	11.25	0.65
95th-Percentile Queue Length [veh/ln]	0.75	6.64	0.41	0.94	0.81	0.05
95th-Percentile Queue Length [ft/ln]	18.69	166.07	10.27	23.50	20.26	1.17

**Movement, Approach, & Intersection Results**

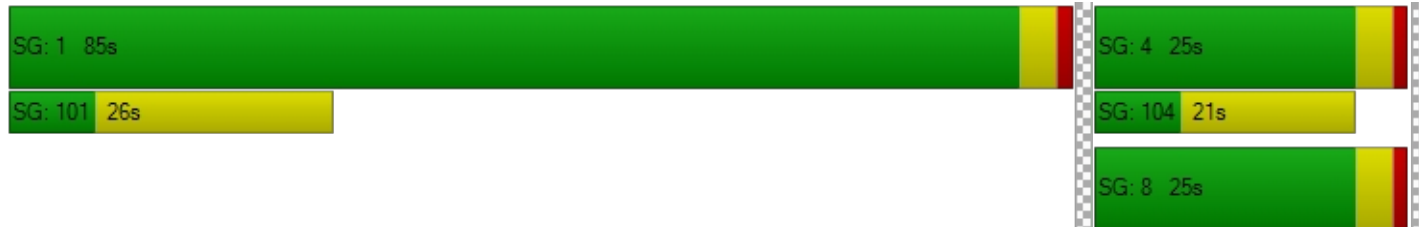
d_M, Delay for Movement [s/veh]	46.40	57.42	1.57	1.74	1.70	1.43
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	56.16		1.69		1.68	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	14.03					
Intersection LOS	B					
Intersection V/C	0.188					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.160	2.142	2.080
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.614	4.439
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 6: Euclid Street at Malvern Avenue

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.393

#### Intersection Setup

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	42	982	23	19	983	55	56	54	58	29	27	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	982	23	19	983	55	56	54	58	29	27	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	246	6	5	246	14	14	14	15	7	7	7
Total Analysis Volume [veh/h]	42	982	23	19	983	55	56	54	58	29	27	28
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	12	33	0	10	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	88	81	81	88	80	80	14	6	6	14	5	5
g / C, Green / Cycle	0.80	0.74	0.74	0.80	0.73	0.73	0.13	0.06	0.06	0.13	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.02	0.27	0.27	0.01	0.28	0.28	0.03	0.03	0.03	0.02	0.01	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1329	1406	1332	1350	1377	1304	301	109	103	272	85	81
d1, Uniform Delay [s]	2.23	5.11	5.10	2.20	5.82	5.78	43.34	50.31	50.51	42.68	50.92	50.99
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.75	0.78	0.00	0.84	0.86	0.29	3.43	4.69	0.17	2.10	2.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.03	0.37	0.37	0.01	0.39	0.38	0.19	0.49	0.56	0.11	0.32	0.35
d, Delay for Lane Group [s/veh]	2.28	5.86	5.88	2.21	6.66	6.63	43.64	53.75	55.20	42.85	53.02	53.52
Lane Group LOS	A	A	A	A	A	A	D	D	E	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.15	3.88	3.65	0.06	4.46	4.13	1.40	1.55	1.69	0.72	0.77	0.81
50th-Percentile Queue Length [ft/ln]	3.83	97.05	91.27	1.57	111.38	103.13	35.05	38.63	42.22	17.88	19.26	20.13
95th-Percentile Queue Length [veh/ln]	0.28	6.99	6.57	0.11	7.92	7.43	2.52	2.78	3.04	1.29	1.39	1.45
95th-Percentile Queue Length [ft/ln]	6.90	174.69	164.29	2.82	197.92	185.64	63.09	69.54	75.99	32.19	34.67	36.24

**Movement, Approach, & Intersection Results**

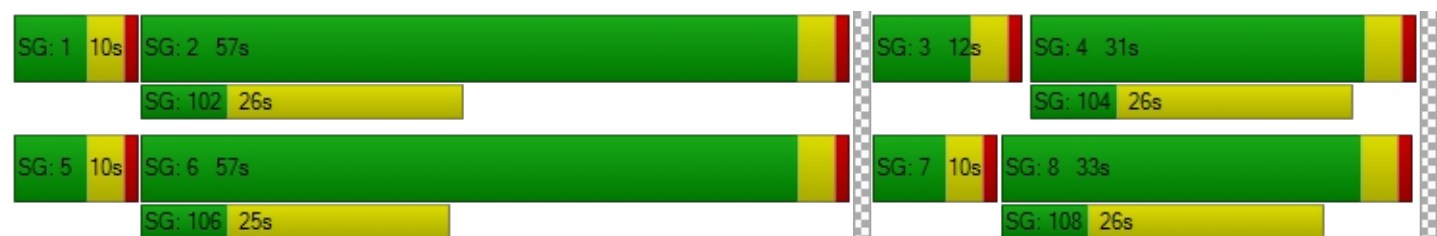
d_M, Delay for Movement [s/veh]	2.28	5.87	5.88	2.21	6.65	6.63	43.64	53.75	55.20	42.85	53.02	53.52
Movement LOS	A	A	A	A	A	A	D	D	E	D	D	D
d_A, Approach Delay [s/veh]	5.72			6.57			50.88			49.68		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.89											
Intersection LOS	B											
Intersection V/C	0.393											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.725			2.728			2.411			2.365		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			491		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.423			2.432			1.698			1.629		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









### Intersection Level Of Service Report

#### Intersection 7: Harbor Boulevard at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	109	924	115	134	829	133	195	408	109	204	449	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	924	115	134	829	133	195	408	109	204	449	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	231	29	34	207	33	49	102	27	51	112	25
Total Analysis Volume [veh/h]	109	924	115	134	829	133	195	408	109	204	449	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	43	0	10	43	0	15	46	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	71	61	61	71	61	61	31	20	20	31	16	16
g / C, Green / Cycle	0.64	0.55	0.55	0.64	0.55	0.55	0.29	0.18	0.18	0.29	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.28	0.07	0.27	0.25	0.11	0.14	0.13	0.11	0.12	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	945	1047	992	913	1049	994	411	351	333	367	565	268
d1, Uniform Delay [s]	7.52	15.55	15.31	7.63	15.06	14.80	31.51	42.76	42.27	31.69	45.24	42.24
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	1.84	1.80	0.07	1.59	1.53	0.85	3.82	3.06	1.32	2.59	0.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.52	0.50	0.15	0.48	0.46	0.47	0.78	0.73	0.56	0.79	0.37
d, Delay for Lane Group [s/veh]	7.77	17.39	17.11	7.71	16.65	16.33	32.37	46.59	45.33	33.01	47.83	43.10
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.00	8.77	7.89	1.18	7.90	7.01	4.25	7.45	6.45	4.50	6.10	2.52
50th-Percentile Queue Length [ft/ln]	24.99	219.30	197.19	29.61	197.44	175.26	106.15	186.23	161.37	112.49	152.40	62.88
95th-Percentile Queue Length [veh/ln]	1.80	13.63	12.49	2.13	12.51	11.35	7.63	11.93	10.62	7.98	10.15	4.53
95th-Percentile Queue Length [ft/ln]	44.97	340.73	312.33	53.30	312.66	283.82	190.64	298.13	265.53	199.46	253.63	113.18

**Movement, Approach, & Intersection Results**

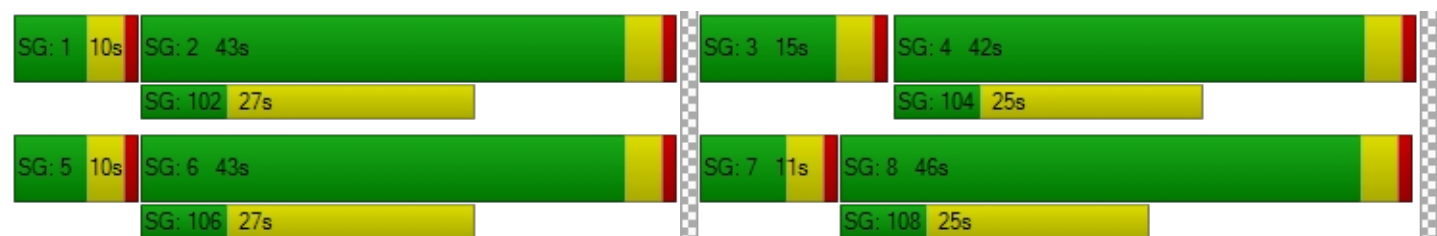
d_M, Delay for Movement [s/veh]	7.77	17.28	17.11	7.71	16.52	16.33	32.37	46.17	45.33	33.01	47.83	43.10
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	16.36			15.42			42.26			43.19		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.50											
Intersection LOS	C											
Intersection V/C	0.647											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.815			2.807			2.672			2.800		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			709			764			691		
d_b, Bicycle Delay [s]	22.91			22.91			21.02			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.507			2.464			2.147			2.181		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.411

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	99	285	92	73	313	110	102	514	116	116	519	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	285	92	73	313	110	102	514	116	116	519	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	71	23	18	78	28	26	129	29	29	130	10
Total Analysis Volume [veh/h]	99	285	92	73	313	110	102	514	116	116	519	38
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	32	0	10	29	0	16	53	0	15	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	70	61	61	70	60	60	8	22	22	6	20	20
g / C, Green / Cycle	0.64	0.55	0.55	0.64	0.55	0.55	0.07	0.20	0.20	0.05	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.05	0.04	0.12	0.11	0.06	0.18	0.16	0.03	0.14	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1118	2086	988	1164	1037	982	130	385	364	188	700	332
d1, Uniform Delay [s]	7.77	12.11	11.81	7.65	12.89	12.77	50.26	42.47	41.93	50.97	42.43	37.43
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.14	0.19	0.02	0.48	0.46	10.03	5.99	4.44	3.25	1.57	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.14	0.09	0.06	0.22	0.20	0.79	0.87	0.81	0.62	0.74	0.11
d, Delay for Lane Group [s/veh]	7.93	12.25	11.99	7.67	13.37	13.23	60.29	48.46	46.37	54.22	44.01	37.58
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	1.71	1.11	0.64	2.94	2.57	3.12	9.34	8.09	1.65	6.78	0.87
50th-Percentile Queue Length [ft/ln]	22.85	42.87	27.64	15.89	73.38	64.25	77.95	233.39	202.18	41.20	169.60	21.76
95th-Percentile Queue Length [veh/ln]	1.65	3.09	1.99	1.14	5.28	4.63	5.61	14.35	12.75	2.97	11.06	1.57
95th-Percentile Queue Length [ft/ln]	41.13	77.16	49.75	28.61	132.09	115.65	140.32	358.66	318.78	74.16	276.39	39.17

**Movement, Approach, & Intersection Results**

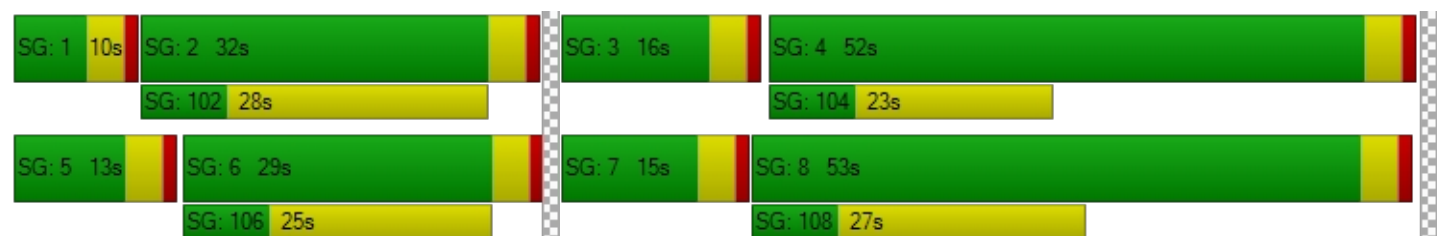
d_M, Delay for Movement [s/veh]	7.93	12.25	11.99	7.67	13.33	13.23	60.29	47.73	46.37	54.22	44.01	37.58
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.30			12.47			49.26			45.40		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	32.89											
Intersection LOS	C											
Intersection V/C	0.411											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.628			2.489			2.674			2.851		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			455			891			873		
d_b, Bicycle Delay [s]	30.56			32.84			16.91			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.952			1.969			2.164			2.115		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.265

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	20	19	120	15	17	18	619	3	18	716	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	20	19	120	15	17	18	619	3	18	716	110
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	5	30	4	4	5	155	1	5	179	28
Total Analysis Volume [veh/h]	5	20	19	120	15	17	18	619	3	18	716	110
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	6	15	87	87	87	81	81	91
g / C, Green / Cycle	0.04	0.04	0.04	0.06	0.13	0.79	0.79	0.79	0.73	0.73	0.83
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.03	0.02	0.01	0.17	0.17	0.01	0.19	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	81	78	73	197	240	1403	1508	1429	1268	2788	1488
d1, Uniform Delay [s]	50.76	51.16	51.16	50.73	42.06	2.36	2.81	2.81	3.94	4.81	1.76
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	1.73	1.83	3.01	0.25	0.00	0.32	0.34	0.02	0.22	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.26	0.26	0.61	0.13	0.01	0.21	0.21	0.01	0.26	0.07
d, Delay for Lane Group [s/veh]	51.08	52.89	53.00	53.74	42.30	2.37	3.14	3.15	3.96	5.03	1.78
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.57	0.55	1.70	0.79	0.06	1.44	1.37	0.10	2.39	0.29
50th-Percentile Queue Length [ft/ln]	3.49	14.29	13.63	42.38	19.64	1.58	36.09	34.30	2.56	59.85	7.25
95th-Percentile Queue Length [veh/ln]	0.25	1.03	0.98	3.05	1.41	0.11	2.60	2.47	0.18	4.31	0.52
95th-Percentile Queue Length [ft/ln]	6.28	25.73	24.53	76.29	35.36	2.85	64.96	61.74	4.60	107.72	13.06

**Movement, Approach, & Intersection Results**

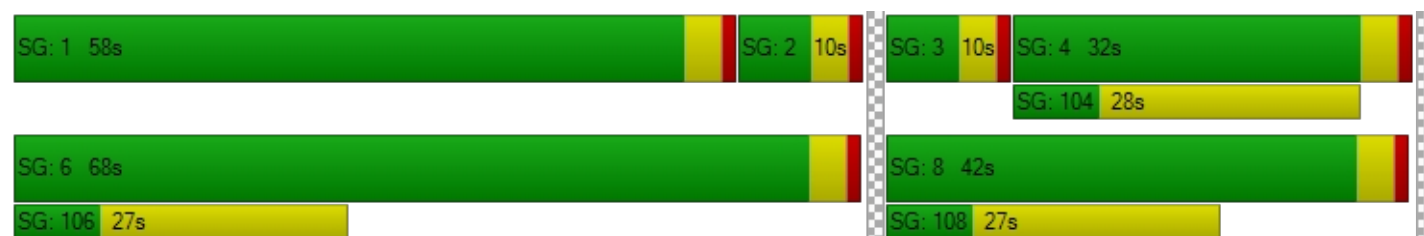
d_M, Delay for Movement [s/veh]	51.08	52.89	53.00	53.74	42.30	42.30	2.37	3.14	3.15	3.96	5.03	1.78
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.73			51.33			3.12			4.58		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.52											
Intersection LOS	A											
Intersection V/C	0.265											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.186			2.233			2.585			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.632			1.810			2.088			2.256		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 10: Raymond Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.374

#### Intersection Setup

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	65	107	120	77	123	60	53	614	64	88	689	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	107	120	77	123	60	53	614	64	88	689	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	27	30	19	31	15	13	154	16	22	172	15
Total Analysis Volume [veh/h]	65	107	120	77	123	60	53	614	64	88	689	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	37	0	14	39	0	11	45	0	14	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	19	10	10	19	10	10	83	73	73	83	74	74
g / C, Green / Cycle	0.18	0.09	0.09	0.18	0.09	0.09	0.75	0.66	0.66	0.75	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.07	0.04	0.05	0.05	0.03	0.19	0.18	0.05	0.21	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	334	171	162	324	176	167	1278	1258	1192	1294	1272	1205
d1, Uniform Delay [s]	38.67	48.31	48.84	38.94	47.72	47.59	3.54	7.71	7.66	3.61	7.58	7.52
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	3.72	6.49	0.37	2.63	2.47	0.01	0.56	0.56	0.10	0.62	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.63	0.74	0.24	0.55	0.52	0.04	0.28	0.27	0.07	0.31	0.30
d, Delay for Lane Group [s/veh]	38.95	52.02	55.33	39.31	50.35	50.05	3.55	8.27	8.22	3.71	8.20	8.15
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.53	3.00	3.50	1.83	2.66	2.37	0.26	3.41	3.12	0.47	3.75	3.44
50th-Percentile Queue Length [ft/ln]	38.23	75.12	87.48	45.67	66.38	59.33	6.58	85.35	77.96	11.86	93.77	85.96
95th-Percentile Queue Length [veh/ln]	2.75	5.41	6.30	3.29	4.78	4.27	0.47	6.15	5.61	0.85	6.75	6.19
95th-Percentile Queue Length [ft/ln]	68.81	135.22	157.46	82.20	119.48	106.80	11.84	153.64	140.34	21.35	168.78	154.74

**Movement, Approach, & Intersection Results**

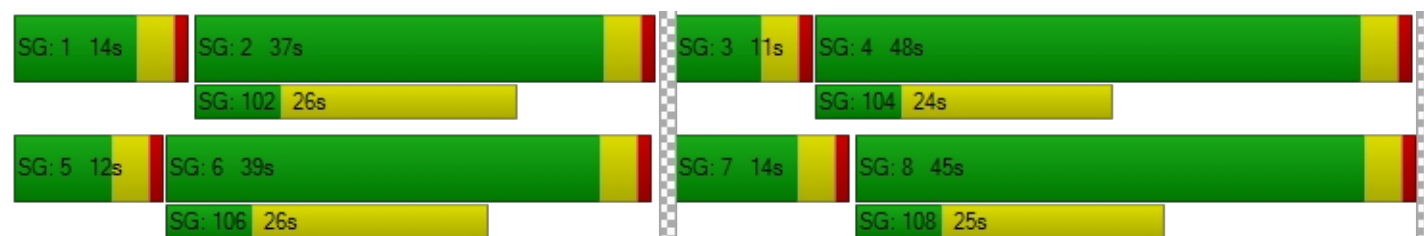
d_M, Delay for Movement [s/veh]	38.95	52.02	55.33	39.31	50.29	50.05	3.55	8.25	8.22	3.71	8.18	8.15
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	50.47			46.98			7.91			7.71		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	18.48											
Intersection LOS	B											
Intersection V/C	0.374											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.505			2.310			2.621			2.643		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			636			745			800		
d_b, Bicycle Delay [s]	26.95			25.57			21.64			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.041			1.774			2.163			2.250		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	32	33	70	56	48	32	21	681	29	44	812	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	33	70	56	48	32	21	681	29	44	812	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	8	18	14	12	8	5	170	7	11	203	9
Total Analysis Volume [veh/h]	32	33	70	56	48	32	21	681	29	44	812	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	10	31	0	10	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	95	87	87	95	88	88
g / C, Green / Cycle	0.06	0.06	0.06	0.06	0.06	0.86	0.79	0.79	0.86	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.04	0.03	0.04	0.01	0.19	0.19	0.02	0.23	0.23
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	75	121	115	122	115	1523	1494	1415	1541	1521	1441
d1, Uniform Delay [s]	49.08	49.06	50.16	49.76	50.45	1.03	3.12	3.11	1.05	2.85	2.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.87	1.20	5.19	2.67	7.46	0.00	0.39	0.41	0.03	0.48	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.27	0.61	0.46	0.70	0.01	0.25	0.24	0.03	0.29	0.28
d, Delay for Lane Group [s/veh]	52.95	50.27	55.35	52.43	57.92	1.04	3.51	3.52	1.08	3.32	3.33
Lane Group LOS	D	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.92	0.90	2.04	1.58	2.39	0.03	1.81	1.70	0.07	2.02	1.89
50th-Percentile Queue Length [ft/ln]	22.96	22.61	50.98	39.44	59.79	0.71	45.35	42.44	1.80	50.52	47.17
95th-Percentile Queue Length [veh/ln]	1.65	1.63	3.67	2.84	4.31	0.05	3.27	3.06	0.13	3.64	3.40
95th-Percentile Queue Length [ft/ln]	41.33	40.71	91.76	71.00	107.63	1.29	81.64	76.39	3.25	90.93	84.91

**Movement, Approach, & Intersection Results**

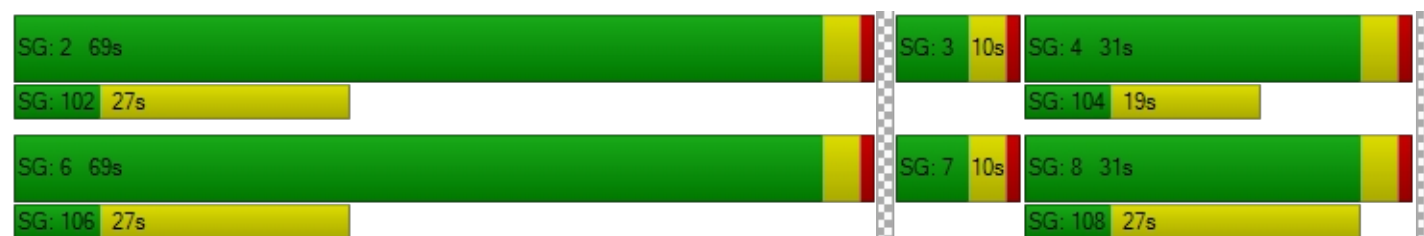
d_M, Delay for Movement [s/veh]	52.95	50.27	55.35	52.43	57.92	57.92	1.04	3.51	3.52	1.08	3.33	3.33
Movement LOS	D	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.54			55.66			3.44			3.22		
Approach LOS	D			E			A			A		
d_I, Intersection Delay [s/veh]	10.66											
Intersection LOS	B											
Intersection V/C	0.311											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.253			2.048			2.668			2.720		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			491		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			31.31		
I_b,int, Bicycle LOS Score for Intersection	1.782			1.784			2.163			2.296		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.480

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	114	327	104	170	299	247	230	592	59	124	556	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	327	104	170	299	247	230	592	59	124	556	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	82	26	43	75	62	58	148	15	31	139	34
Total Analysis Volume [veh/h]	114	327	104	170	299	247	230	592	59	124	556	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	34	0	16	37	37	23	47	0	13	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	57	57	7	56	70	10	20	20	9	19	19
g / C, Green / Cycle	0.08	0.52	0.52	0.07	0.51	0.64	0.09	0.18	0.18	0.08	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.06	0.09	0.06	0.05	0.08	0.14	0.07	0.16	0.03	0.07	0.15	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	142	1974	935	237	1932	1146	323	703	333	148	666	315
d1, Uniform Delay [s]	49.87	13.91	13.50	50.28	14.45	8.41	48.55	43.31	37.80	49.77	43.86	40.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.04	0.18	0.24	4.02	0.17	0.09	2.92	2.83	0.25	11.49	2.84	0.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.80	0.17	0.11	0.72	0.15	0.22	0.71	0.84	0.18	0.84	0.83	0.43
d, Delay for Lane Group [s/veh]	59.90	14.09	13.74	54.31	14.62	8.51	51.47	46.14	38.05	61.26	46.71	41.44
Lane Group LOS	E	B	B	D	B	A	D	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.47	2.16	1.36	2.42	2.01	2.38	3.19	8.00	1.37	3.83	7.54	3.37
50th-Percentile Queue Length [ft/ln]	86.83	53.91	34.06	60.55	50.29	59.41	79.83	200.11	34.19	95.66	188.42	84.19
95th-Percentile Queue Length [veh/ln]	6.25	3.88	2.45	4.36	3.62	4.28	5.75	12.64	2.46	6.89	12.04	6.06
95th-Percentile Queue Length [ft/ln]	156.30	97.04	61.31	108.98	90.53	106.94	143.69	316.11	61.55	172.19	300.97	151.54

**Movement, Approach, & Intersection Results**

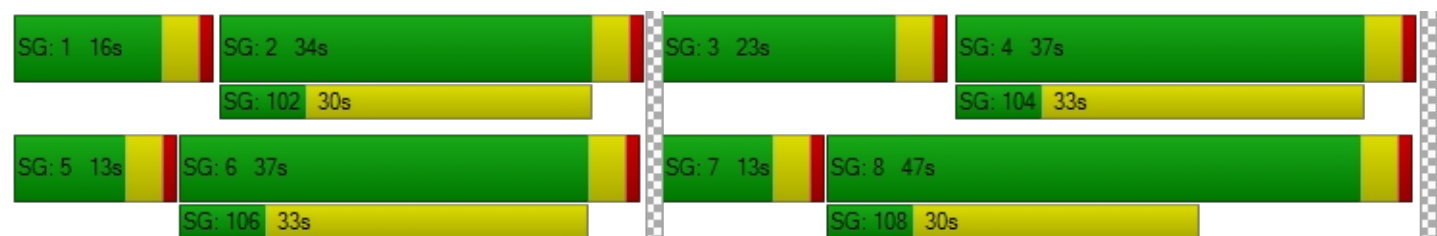
d_M, Delay for Movement [s/veh]	59.90	14.09	13.74	54.31	14.62	8.51	51.47	46.14	38.05	61.26	46.71	41.44
Movement LOS	E	B	B	D	B	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.61			21.93			46.99			48.04		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.91											
Intersection LOS	D											
Intersection V/C	0.480											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.629			2.800			2.854			2.736		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			600		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.009			2.150			2.286			2.233		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.584

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	0	30	0	165	110	95	214	0
Total Analysis Volume [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	19	0	68	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	63	63	25	93
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.17	0.24	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		155	155	2178	1031	417	3196
d1, Uniform Delay [s]		48.64	49.16	12.12	13.25	41.13	1.79
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.53	7.66	0.36	1.28	7.84	0.21
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.65	0.77	0.30	0.42	0.91	0.27
d, Delay for Lane Group [s/veh]		53.18	56.83	12.48	14.53	48.97	2.00
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.87	3.52	4.15	6.25	10.79	1.18
50th-Percentile Queue Length [ft/ln]		71.86	88.02	103.76	156.20	269.83	29.55
95th-Percentile Queue Length [veh/ln]		5.17	6.34	7.47	10.35	16.18	2.13
95th-Percentile Queue Length [ft/ln]		129.35	158.43	186.77	258.68	404.53	53.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	53.18	53.18	56.83	0.00	12.48	14.53	48.97	2.00	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.15			13.30			16.40		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	18.41											
Intersection LOS	B											
Intersection V/C	0.584											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.230	1.832	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	273	1509
d_b, Bicycle Delay [s]	55.00	37.64	41.02	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	1.923	2.162	2.579
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	0	106	0	0	0	50	151	0	0	200	37
Total Analysis Volume [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	66	0	0	0	0	0	25	44	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		14	80	61	61
g / C, Green / Cycle	0.20	0.20	0.20		0.13	0.73	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.16		0.11	0.16	0.25	0.26
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	361	361	361		237	2762	1062	1006
d1, Uniform Delay [s]	42.20	42.05	41.87		46.69	4.87	14.24	14.51
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.05	4.58	4.13		8.27	0.18	1.36	1.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.80		0.85	0.22	0.45	0.47
d, Delay for Lane Group [s/veh]	47.25	46.63	46.00		54.96	5.06	15.60	16.09
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.28	8.06	7.82		5.90	2.03	7.09	7.25
50th-Percentile Queue Length [ft/ln]	206.93	201.43	195.44		147.39	50.68	177.18	181.36
95th-Percentile Queue Length [veh/ln]	13.00	12.71	12.40		9.88	3.65	11.45	11.67
95th-Percentile Queue Length [ft/ln]	324.88	317.81	310.07		246.94	91.22	286.33	291.79

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.03	0.00	46.19	0.00	0.00	0.00	54.96	5.06	0.00	0.00	15.80	16.09
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	46.63			0.00			17.53			15.85		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.69											
Intersection LOS	C											
Intersection V/C	0.608											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.237	1.773	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	727	273
d_b, Bicycle Delay [s]	55.00	55.00	22.27	41.02
I_b,int, Bicycle LOS Score for Intersection	5.591	4.132	2.223	2.342
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 15: Lemon Street at Wilshire Avenue

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.224

#### Intersection Setup

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	26	473	17	14	639	11	12	13	31	11	14	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	473	17	14	639	11	12	13	31	11	14	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	118	4	4	160	3	3	3	8	3	4	3
Total Analysis Volume [veh/h]	26	473	17	14	639	11	12	13	31	11	14	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.13	0.13	0.01	0.18	0.18	0.03	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1566	1676	1588	1579	1676	1588	121	124
d1, Uniform Delay [s]	0.77	0.88	0.88	0.77	0.93	0.93	51.73	51.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.19	0.20	0.01	0.27	0.28	2.75	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.15	0.15	0.01	0.20	0.20	0.46	0.30
d, Delay for Lane Group [s/veh]	0.79	1.07	1.08	0.78	1.19	1.21	54.47	52.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.30	0.28	0.01	0.41	0.39	1.61	1.04
50th-Percentile Queue Length [ft/ln]	0.68	7.39	7.03	0.36	10.31	9.87	40.29	25.98
95th-Percentile Queue Length [veh/ln]	0.05	0.53	0.51	0.03	0.74	0.71	2.90	1.87
95th-Percentile Queue Length [ft/ln]	1.22	13.29	12.66	0.65	18.56	17.76	72.52	46.76

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.79	1.07	1.08	0.78	1.20	1.21	54.47	54.47	54.47	52.51	52.51	52.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.06			1.19			54.47			52.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.97											
Intersection LOS	A											
Intersection V/C	0.224											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.558			2.553			1.814			1.784		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.985			2.107			1.652			1.621		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	62	930	72	81	908	164	183	381	72	108	360	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	930	72	81	908	164	183	381	72	108	360	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	233	18	20	227	41	46	95	18	27	90	39
Total Analysis Volume [veh/h]	62	930	72	81	908	164	183	381	72	108	360	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	11	33	0	10	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	45	36	36	45	36	36	57	47	47	57	44	44
g / C, Green / Cycle	0.41	0.33	0.33	0.41	0.33	0.33	0.51	0.43	0.43	0.51	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.04	0.05	0.30	0.28	0.10	0.10	0.04	0.06	0.09	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	330	1239	587	446	626	594	905	1612	764	902	1522	721
d1, Uniform Delay [s]	19.62	33.10	26.04	19.84	35.20	34.43	14.47	20.28	19.00	13.83	21.85	21.67
k, delay calibration	0.11	0.11	0.11	0.11	0.18	0.15	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	0.94	0.09	0.19	7.90	5.05	0.11	0.35	0.25	0.27	0.37	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.75	0.12	0.18	0.90	0.85	0.20	0.24	0.09	0.12	0.24	0.22
d, Delay for Lane Group [s/veh]	19.90	34.03	26.13	20.03	43.10	39.49	14.58	20.62	19.25	14.10	22.22	22.36
Lane Group LOS	B	C	C	C	D	D	B	C	B	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.99	11.07	1.34	1.30	15.53	13.27	2.46	3.19	1.15	1.44	3.14	2.79
50th-Percentile Queue Length [ft/ln]	24.82	276.79	33.61	32.55	388.28	331.72	61.56	79.66	28.83	36.04	78.52	69.72
95th-Percentile Queue Length [veh/ln]	1.79	16.53	2.42	2.34	21.99	19.24	4.43	5.74	2.08	2.59	5.65	5.02
95th-Percentile Queue Length [ft/ln]	44.67	413.22	60.49	58.60	549.85	481.07	110.82	143.38	51.90	64.87	141.34	125.50

**Movement, Approach, & Intersection Results**

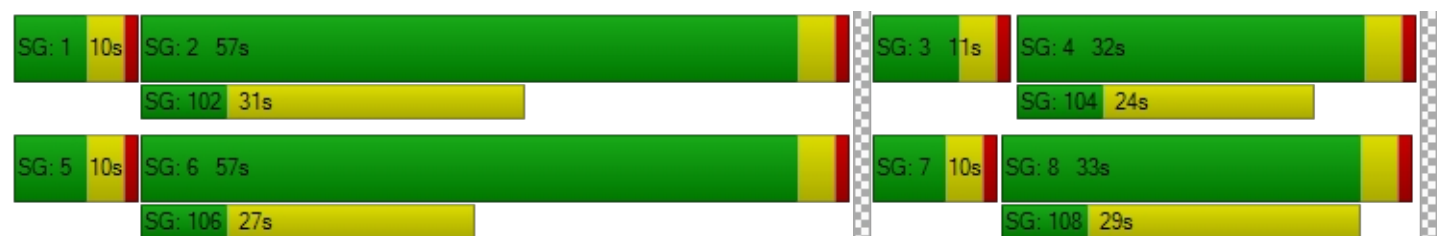
d_M, Delay for Movement [s/veh]	19.90	34.03	26.13	20.03	41.73	39.49	14.58	20.62	19.25	14.10	22.22	22.36
Movement LOS	B	C	C	C	D	D	B	C	B	B	C	C
d_A, Approach Delay [s/veh]	32.67			39.89			18.73			20.85		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	30.39											
Intersection LOS	C											
Intersection V/C	0.554											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.880			2.891			2.692			2.690		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			509		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			30.56		
I_b,int, Bicycle LOS Score for Intersection	2.437			2.511			2.084			2.075		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:  
Analysis Method:  
Analysis Period:

Signalized  
HCM 6th Edition  
15 minutes

Delay (sec / veh): 32.4  
Level Of Service: C  
Volume to Capacity (v/c): 0.457

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	116	440	200	31	547	54	40	428	96	218	435	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	440	200	31	547	54	40	428	96	218	435	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	110	50	8	137	14	10	107	24	55	109	7
Total Analysis Volume [veh/h]	116	440	200	31	547	54	40	428	96	218	435	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	58	0	12	43	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	25	25	32	21	21	4	56	56	9	61	61
g / C, Green / Cycle	0.29	0.22	0.22	0.29	0.19	0.19	0.04	0.51	0.51	0.08	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	0.11	0.02	0.16	0.16	0.02	0.11	0.05	0.06	0.11	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	346	853	404	448	364	345	71	1942	920	297	2114	1002
d1, Uniform Delay [s]	29.23	37.45	37.26	27.83	43.06	42.82	51.94	14.84	13.91	49.16	12.23	11.00
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.57	0.49	0.94	0.06	5.96	5.32	6.81	0.26	0.23	3.49	0.22	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.52	0.50	0.07	0.86	0.83	0.56	0.22	0.10	0.73	0.21	0.03
d, Delay for Lane Group [s/veh]	29.80	37.94	38.20	27.89	49.02	48.14	58.75	15.10	14.14	52.65	12.45	11.05
Lane Group LOS	C	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.37	5.24	4.79	0.60	8.78	8.00	1.22	2.97	1.28	3.06	2.68	0.31
50th-Percentile Queue Length [ft/ln]	59.27	130.99	119.80	14.93	219.55	199.97	30.46	74.36	31.98	76.54	66.99	7.64
95th-Percentile Queue Length [veh/ln]	4.27	8.99	8.38	1.08	13.64	12.64	2.19	5.35	2.30	5.51	4.82	0.55
95th-Percentile Queue Length [ft/ln]	106.68	224.85	209.55	26.88	341.05	315.93	54.82	133.85	57.57	137.78	120.58	13.76

**Movement, Approach, & Intersection Results**

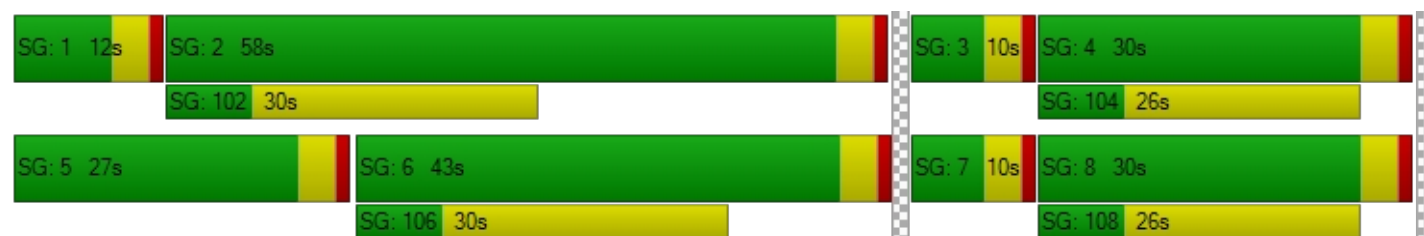
d_M, Delay for Movement [s/veh]	29.80	37.94	38.20	27.89	48.64	48.14	58.75	15.10	14.14	52.65	12.45	11.05
Movement LOS	C	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	36.76			47.58			18.03			25.28		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	32.38											
Intersection LOS	C											
Intersection V/C	0.457											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.725			2.532			2.687			2.801		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			709			473			473		
d_b, Bicycle Delay [s]	14.25			22.91			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.183			2.081			2.025			2.121		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.499

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	65	1149	35	17	1210	26	43	97	89	74	90	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	1149	35	17	1210	26	43	97	89	74	90	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	287	9	4	303	7	11	24	22	19	23	6
Total Analysis Volume [veh/h]	65	1149	35	17	1210	26	43	97	89	74	90	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	64	0	0	64	0	0	46	0	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.04	0.32	0.32	0.01	0.34	0.33	0.13	0.04	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1222	1484	1406	1234	1484	1406	301	79	262
d1, Uniform Delay [s]	2.72	3.87	3.85	2.65	3.95	3.93	45.85	41.73	42.72
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	0.85	0.88	0.02	0.91	0.95	3.94	34.20	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.41	0.41	0.01	0.43	0.43	0.76	0.94	0.43
d, Delay for Lane Group [s/veh]	2.80	4.71	4.73	2.67	4.85	4.88	49.78	75.93	43.85
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.28	3.77	3.54	0.07	4.01	3.78	6.41	2.54	2.90
50th-Percentile Queue Length [ft/ln]	7.11	94.25	88.44	1.80	100.36	94.56	160.19	63.38	72.55
95th-Percentile Queue Length [veh/ln]	0.51	6.79	6.37	0.13	7.23	6.81	10.56	4.56	5.22
95th-Percentile Queue Length [ft/ln]	12.80	169.66	159.19	3.25	180.66	170.21	263.97	114.09	130.58

**Movement, Approach, & Intersection Results**

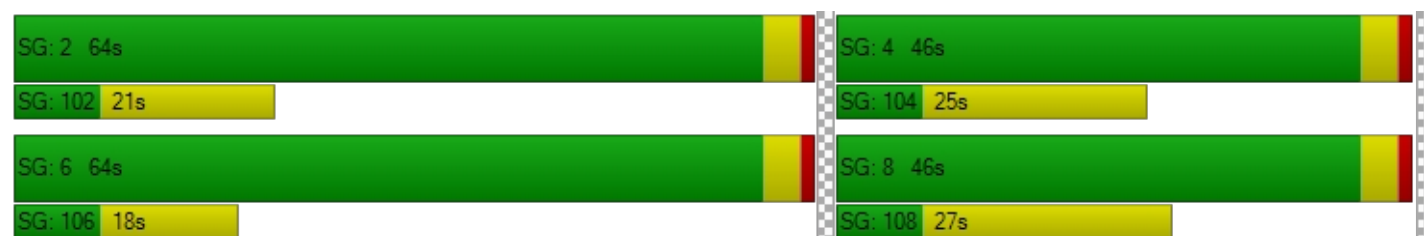
d_M, Delay for Movement [s/veh]	2.80	4.72	4.73	2.67	4.87	4.88	49.78	49.78	49.78	75.93	43.85	43.85
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.62			4.84			49.78			56.48		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.60											
Intersection LOS	B											
Intersection V/C	0.499											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.926			2.852			2.017			2.083		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1091			1091			764			764		
d_b, Bicycle Delay [s]	11.36			11.36			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.590			2.593			1.937			1.870		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.363

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	103	785	64	59	765	53	41	43	97	104	38	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	785	64	59	765	53	41	43	97	104	38	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	196	16	15	191	13	10	11	24	26	10	12
Total Analysis Volume [veh/h]	103	785	64	59	765	53	41	43	97	104	38	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.23	0.23	0.03	0.22	0.22	0.10	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1367	1528	1448	1362	1528	1448	261	272
d1, Uniform Delay [s]	2.23	2.74	2.71	2.17	2.70	2.69	46.99	47.20
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.48	0.49	0.06	0.45	0.46	3.29	3.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.29	0.28	0.04	0.28	0.27	0.69	0.69
d, Delay for Lane Group [s/veh]	2.33	3.21	3.20	2.23	3.16	3.15	50.28	50.34
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.38	1.98	1.82	0.21	1.88	1.74	5.05	5.25
50th-Percentile Queue Length [ft/ln]	9.46	49.56	45.56	5.28	47.09	43.53	126.18	131.33
95th-Percentile Queue Length [veh/ln]	0.68	3.57	3.28	0.38	3.39	3.13	8.73	9.01
95th-Percentile Queue Length [ft/ln]	17.03	89.20	82.00	9.50	84.76	78.36	218.29	225.31

**Movement, Approach, & Intersection Results**

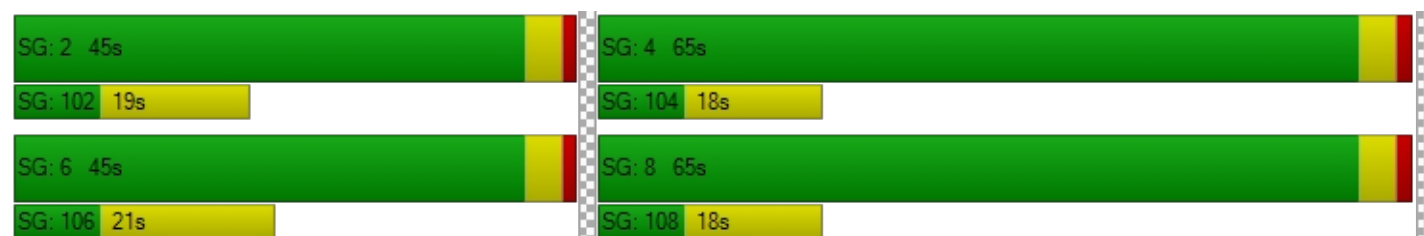
d_M, Delay for Movement [s/veh]	2.33	3.21	3.20	2.23	3.15	3.15	50.28	50.28	50.28	50.34	50.34	50.34
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.11			3.09			50.28			50.34		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.03											
Intersection LOS	B											
Intersection V/C	0.363											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.831			2.709			2.054			1.981		
Crosswalk LOS	C			B			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.345			2.283			1.858			1.870		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	230	1117	196	197	1126	161	233	689	258	223	820	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1117	196	197	1126	161	233	689	258	223	820	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	279	49	49	282	40	58	172	65	56	205	46
Total Analysis Volume [veh/h]	230	1117	196	197	1126	161	233	689	258	223	820	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	41	0	12	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	35	35	8	35	35	16	36	36	15	35	35
g / C, Green / Cycle	0.07	0.32	0.32	0.07	0.32	0.32	0.15	0.32	0.32	0.14	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.07	0.29	0.11	0.06	0.28	0.13	0.13	0.12	0.14	0.12	0.14	0.10
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	256	1204	571	256	1204	571	264	1847	583	253	1812	572
d1, Uniform Delay [s]	50.60	36.36	28.81	50.10	35.52	29.50	46.03	28.60	29.35	46.39	29.90	28.51
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.93	3.70	0.36	4.87	2.17	0.47	9.41	0.58	2.43	9.66	0.82	1.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.93	0.34	0.77	0.87	0.41	0.88	0.37	0.44	0.88	0.45	0.32
d, Delay for Lane Group [s/veh]	61.53	40.06	29.17	54.96	37.68	29.97	55.44	29.18	31.78	56.05	30.72	30.00
Lane Group LOS	E	D	C	D	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.52	14.83	4.01	2.83	13.45	4.90	6.90	4.75	5.75	6.63	5.88	3.92
50th-Percentile Queue Length [ft/ln]	88.02	370.75	100.19	70.73	336.31	122.46	172.52	118.66	143.76	165.83	146.91	98.00
95th-Percentile Queue Length [veh/ln]	6.34	21.15	7.21	5.09	19.47	8.53	11.21	8.32	9.68	10.86	9.85	7.06
95th-Percentile Queue Length [ft/ln]	158.44	528.64	180.35	127.31	486.69	213.20	280.22	207.98	242.08	271.42	246.29	176.40

**Movement, Approach, & Intersection Results**

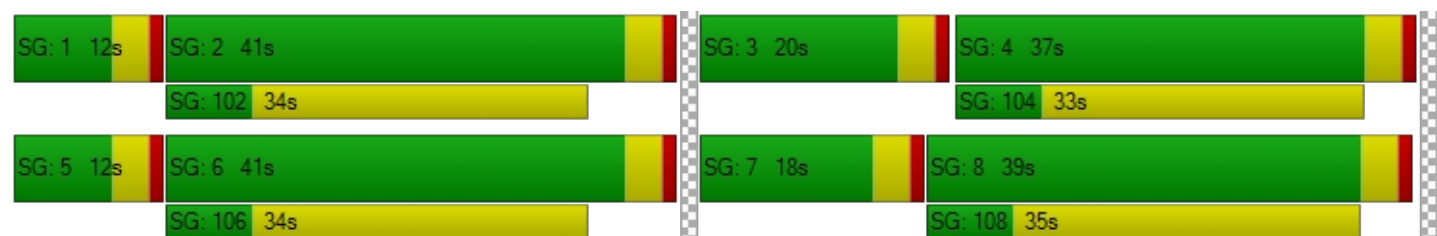
d_M, Delay for Movement [s/veh]	61.53	40.06	29.17	54.96	37.19	29.97	55.44	29.18	31.78	56.05	30.72	30.00
Movement LOS	E	D	C	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	41.88			38.76			34.93			35.22		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	38.02											
Intersection LOS	D											
Intersection V/C	0.730											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.119			3.024			3.026			3.016		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			673			636			600		
d_b, Bicycle Delay [s]	24.22			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.833			2.376			2.209			2.234		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.682

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	297	800	90	168	764	148	167	577	228	120	479	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	297	800	90	168	764	148	167	577	228	120	479	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	200	23	42	191	37	42	144	57	30	120	29
Total Analysis Volume [veh/h]	297	800	90	168	764	148	167	577	228	120	479	117
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	45	0	21	39	0	10	33	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	32	32	45	26	26	12	47	47	6	41	41
g / C, Green / Cycle	0.41	0.29	0.29	0.41	0.24	0.24	0.11	0.43	0.43	0.05	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.17	0.21	0.05	0.09	0.20	0.08	0.09	0.15	0.13	0.03	0.17	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	495	1120	530	500	899	426	200	1616	765	189	699	662
d1, Uniform Delay [s]	22.80	34.69	28.83	21.00	40.16	34.96	47.93	21.45	20.83	51.02	26.38	26.05
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	0.86	0.15	0.39	2.37	0.49	8.75	0.62	0.99	3.51	2.11	1.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.71	0.17	0.34	0.85	0.35	0.83	0.36	0.30	0.64	0.45	0.42
d, Delay for Lane Group [s/veh]	23.97	35.56	28.98	21.39	42.53	35.45	56.69	22.07	21.82	54.53	28.49	28.03
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.53	9.60	1.79	2.85	10.08	3.36	4.96	5.13	4.04	1.71	6.63	5.81
50th-Percentile Queue Length [ft/ln]	138.35	239.98	44.80	71.34	251.98	83.93	123.96	128.18	101.01	42.76	165.78	145.26
95th-Percentile Queue Length [veh/ln]	9.39	14.68	3.23	5.14	15.29	6.04	8.61	8.84	7.27	3.08	10.85	9.76
95th-Percentile Queue Length [ft/ln]	234.80	367.01	80.63	128.41	382.15	151.07	215.26	221.02	181.81	76.97	271.36	244.09

**Movement, Approach, & Intersection Results**

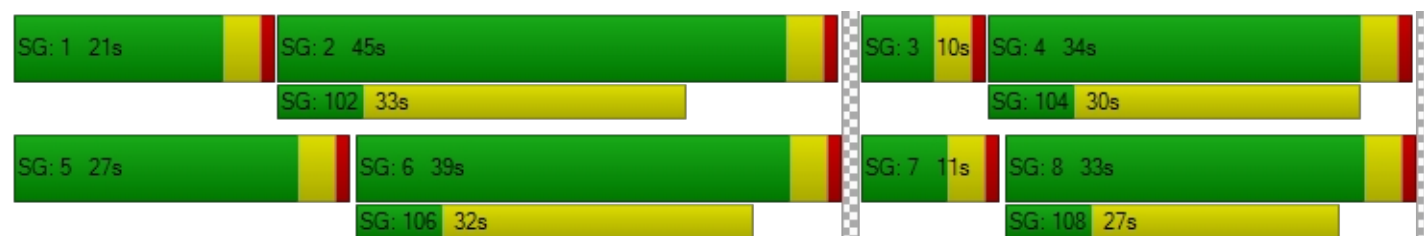
d_M, Delay for Movement [s/veh]	23.97	35.56	28.98	21.39	42.53	35.45	56.69	22.07	21.82	54.53	28.33	28.03
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	32.16			38.27			27.96			32.67		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	32.89											
Intersection LOS	C											
Intersection V/C	0.682											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.836			2.814			2.878			2.894		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			636			527			545		
d_b, Bicycle Delay [s]	21.64			25.57			29.82			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.539			2.451			2.094			2.150		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	394	0	0	353	157	0	0	0	54	90	114
Total Analysis Volume [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.36	0.38		0.12	0.09	0.25
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	203	3593	2022	958		521	1101	521
d1, Uniform Delay [s]	45.80	9.45	17.04	17.59		28.67	27.86	33.81
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.23	0.39	1.81	4.45		0.53	0.17	4.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.44	0.67	0.71		0.41	0.33	0.88
d, Delay for Lane Group [s/veh]	48.03	9.84	18.85	22.03		29.19	28.03	38.67
Lane Group LOS	D	A	B	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.39	5.50	11.20	12.22		4.21	3.37	11.02
50th-Percentile Queue Length [ft/ln]	34.64	137.44	280.04	305.48		105.28	84.14	275.57
95th-Percentile Queue Length [veh/ln]	2.49	9.34	16.69	17.95		7.58	6.06	16.47
95th-Percentile Queue Length [ft/ln]	62.35	233.58	417.26	448.80		189.42	151.45	411.70

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.03	9.84	0.00	0.00	18.97	22.03	0.00	0.00	0.00	29.19	28.03	38.67
Movement LOS	D	A			B	C				C	C	D
d_A, Approach Delay [s/veh]	12.33			19.91			0.00			32.99		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	20.06											
Intersection LOS	C											
Intersection V/C	0.754											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.254			2.387		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.487			2.682			4.132			2.411		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.756

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	172	0	0	260	71	0	0	0	42	131	168
Total Analysis Volume [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	51	41	41		41	41	41
g / C, Green / Cycle	0.06	0.51	0.41	0.41		0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.23	0.25		0.19	0.18	0.37
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	107	2892	1549	734		743	784	743
d1, Uniform Delay [s]	46.35	13.80	22.85	23.24		21.41	21.04	27.56
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.10	0.19	1.53	3.63		0.46	0.38	6.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.24	0.57	0.60		0.47	0.44	0.91
d, Delay for Lane Group [s/veh]	57.46	13.99	24.37	26.86		21.87	21.43	34.31
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.35	2.87	8.12	8.67		5.91	5.69	15.83
50th-Percentile Queue Length [ft/ln]	58.85	71.72	203.06	216.66		147.79	142.15	395.78
95th-Percentile Queue Length [veh/ln]	4.24	5.16	12.80	13.49		9.90	9.60	22.36
95th-Percentile Queue Length [ft/ln]	105.94	129.09	319.90	337.36		247.47	239.92	558.91

**Movement, Approach, & Intersection Results**

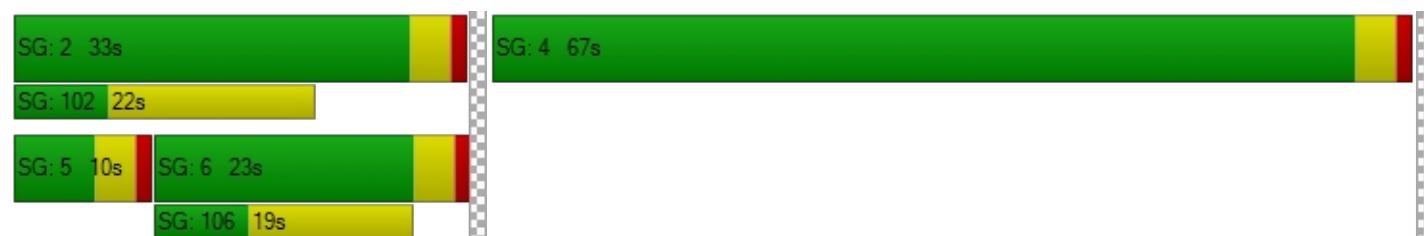
d_M, Delay for Movement [s/veh]	57.46	13.99	0.00	0.00	24.75	26.86	0.00	0.00	0.00	21.87	21.58	34.31
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	18.67			25.20			0.00			27.89		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.81											
Intersection LOS	C											
Intersection V/C	0.756											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.153	2.388
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	1.984	2.288	4.132	2.685
Bicycle LOS	A	B	D	B

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 24: Harbor Boulevard at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.572

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	249	65	120	281	0	168	57	36	0	0	0
Total Analysis Volume [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	49	49	16	69	23	23	23	
g / C, Green / Cycle	0.49	0.49	0.16	0.69	0.23	0.23	0.23	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.14	0.14	0.20	0.19	0.12	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2765	873	576	3930	807	438	415	
d1, Uniform Delay [s]	16.06	15.48	40.44	6.01	36.64	33.63	32.20	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.37	0.86	3.21	0.18	2.33	0.95	0.50	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.30	0.83	0.29	0.83	0.52	0.35	
d, Delay for Lane Group [s/veh]	16.43	16.34	43.66	6.19	38.97	34.58	32.70	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.68	3.65	5.90	2.75	7.95	4.88	2.97	
50th-Percentile Queue Length [ft/ln]	116.89	91.19	147.44	68.72	198.78	122.08	74.36	
95th-Percentile Queue Length [veh/ln]	8.22	6.57	9.88	4.95	12.58	8.51	5.35	
95th-Percentile Queue Length [ft/ln]	205.54	164.15	247.01	123.70	314.39	212.68	133.84	

**Movement, Approach, & Intersection Results**

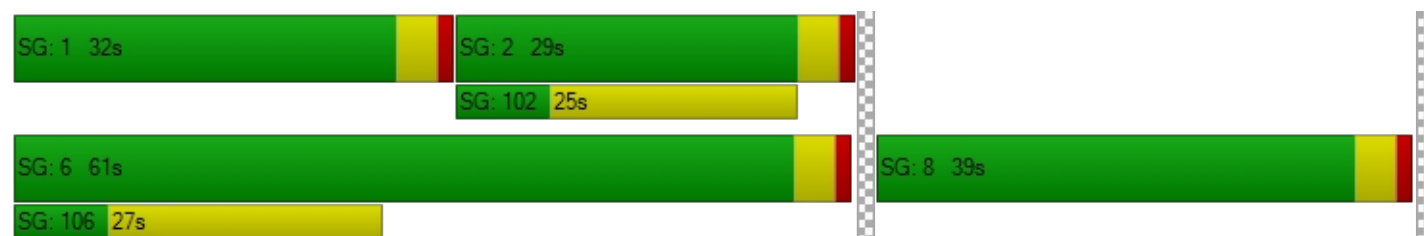
d_M, Delay for Movement [s/veh]	0.00	16.43	16.34	43.66	6.19	0.00	38.97	34.58	32.70	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	16.41			17.38			37.15			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.572											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.390			2.190		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.248			2.442			3.282			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	142	44	140	176	0	49	183	14	0	0	0
Total Analysis Volume [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	18	63	29	29	29	
g / C, Green / Cycle	0.41	0.41	0.18	0.63	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.16	0.19	0.26	0.24	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1540	730	633	2379	529	558	529	
d1, Uniform Delay [s]	20.34	20.51	39.93	8.58	33.74	32.91	25.75	
k, delay calibration	0.50	0.50	0.11	0.50	0.12	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.55	1.27	4.29	0.32	5.67	3.15	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.32	0.34	0.88	0.30	0.89	0.82	0.11	
d, Delay for Lane Group [s/veh]	20.89	21.77	44.22	8.90	39.40	36.07	25.84	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.01	4.18	6.99	3.35	11.46	10.66	1.00	
50th-Percentile Queue Length [ft/ln]	100.17	104.43	174.69	83.78	286.54	266.47	24.95	
95th-Percentile Queue Length [veh/ln]	7.21	7.52	11.32	6.03	17.01	16.01	1.80	
95th-Percentile Queue Length [ft/ln]	180.31	187.98	283.07	150.80	425.35	400.32	44.91	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	21.00	21.77	44.22	8.90	0.00	39.40	37.31	25.84	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	21.19			24.52			37.06			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.82											
Intersection LOS	C											
Intersection V/C	0.634											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.266			2.435		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.969			2.602			2.374			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	19	253	15	5	285
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	19	253	15	5	285
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	63	4	1	71
Total Analysis Volume [veh/h]	0	19	253	15	5	285
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.70	0.00	0.00	7.79	0.00
Movement LOS		A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.07	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.86	0.00	0.00	0.29	0.00
d_A, Approach Delay [s/veh]	9.70		0.00		0.13	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.39					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	4.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.148

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	379	29	5	323	0	2	2	7	33	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	379	29	5	323	0	2	2	7	33	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	95	7	1	81	0	1	1	2	8	0	3
Total Analysis Volume [veh/h]	0	379	29	5	323	0	2	2	7	33	0	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	73	0	10	83	0	0	27	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	93	93	98	98	4	4	4	4
g / C, Green / Cycle	0.84	0.84	0.89	0.89	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.00	0.09	0.00	0.01	0.02	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1600	1515	1648	3369	109	106	101	73
d1, Uniform Delay [s]	1.54	1.55	0.71	0.77	50.66	50.85	51.55	50.91
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.18	0.00	0.06	0.07	0.34	1.88	0.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.13	0.00	0.10	0.02	0.08	0.33	0.15
d, Delay for Lane Group [s/veh]	1.70	1.74	0.71	0.83	50.72	51.19	53.43	51.84
Lane Group LOS	A	A	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.51	0.52	0.00	0.13	0.05	0.25	0.94	0.31
50th-Percentile Queue Length [ft/ln]	12.86	13.05	0.08	3.21	1.37	6.23	23.52	7.79
95th-Percentile Queue Length [veh/ln]	0.93	0.94	0.01	0.23	0.10	0.45	1.69	0.56
95th-Percentile Queue Length [ft/ln]	23.15	23.50	0.14	5.77	2.47	11.21	42.34	14.02

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	1.72	1.74	0.71	0.83	0.00	50.72	51.19	51.19	53.43	0.00	51.84
Movement LOS		A	A	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	1.72			0.83			51.11			53.03		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.89											
Intersection LOS	A											
Intersection V/C	0.148											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.453			1.730			1.982		
Crosswalk LOS	F			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1255			1436			418			0		
d_b, Bicycle Delay [s]	7.64			4.37			34.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.896			1.830			1.578			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.065

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	1	175	236	0	46	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	175	236	0	46	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	44	59	0	12	4
Total Analysis Volume [veh/h]	1	175	236	0	46	14
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.06	0.02
d_M, Delay for Movement [s/veh]	7.71	0.00	0.00	0.00	10.51	9.92
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.27	0.27
95th-Percentile Queue Length [ft/ln]	0.06	0.00	0.00	0.00	6.70	6.70
d_A, Approach Delay [s/veh]	0.04		0.00		10.38	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.34					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	41	171	216	0	0	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	41	171	216	0	0	72
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	43	54	0	0	18
Total Analysis Volume [veh/h]	41	171	216	0	0	72
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.00	0.09
d_M, Delay for Movement [s/veh]	7.74	0.00	0.00	0.00	10.80	9.79
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.00	0.29	0.29
95th-Percentile Queue Length [ft/ln]	2.34	0.00	0.00	0.00	7.16	7.16
d_A, Approach Delay [s/veh]	1.50		0.00		9.79	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.04					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	196	12	24	268	11	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	196	12	24	268	11	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	3	6	67	3	5
Total Analysis Volume [veh/h]	196	12	24	268	11	21
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.02	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.69	0.00	10.79	9.50
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.05	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.34	0.00	3.29	3.29
d_A, Approach Delay [s/veh]	0.00		0.63		9.94	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.94					
Intersection LOS	B					





### Intersection Level Of Service Report

#### Intersection 31: Lemon Street at Parking Structure

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

#### Intersection Setup

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	366	17	0	328	5	0	0	12	0	0	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	366	17	0	328	5	0	0	12	0	0	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	92	4	0	82	1	0	0	3	0	0	5
Total Analysis Volume [veh/h]	6	366	17	0	328	5	0	0	12	0	0	21
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	7.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.30	0.00	0.00	9.52
Movement LOS	A	A	A		A	A			A			A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.08
95th-Percentile Queue Length [ft/ln]	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	1.98
d_A, Approach Delay [s/veh]	0.12			0.00			9.30			9.52		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	0.48											
Intersection LOS	A											

## APPENDIX C

### YORBA LINDA HIGH SCHOOL TRAFFIC COUNTS – FULLERTON COLLEGE FOOTBALL GAME

# National Data & Surveying Services

## Intersection Turning Movement Count

**Location:** Dwy 1 & Bastanchury Rd  
**City:** Yorba Linda  
**Control:** No Control

**Project ID:** 17-01217-001  
**Date:** 2017-10-21

### Total

NS/EW Streets:	Dwy 1				Dwy 1				Bastanchury Rd				Bastanchury Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	1 WL	2 WT	0 WR	0 WU	
11:30 AM	0	0	0	0	0	0	0	0	0	0	14	0	5	0	0	0	19
11:45 AM	0	0	1	0	0	0	0	0	0	0	15	0	3	0	0	0	19
12:00 PM	0	0	1	0	0	0	0	0	0	0	21	0	8	0	0	0	30
12:15 PM	0	0	1	0	0	0	0	0	0	0	24	0	8	0	0	0	33
12:30 PM	0	0	0	0	0	0	0	0	0	0	38	0	6	0	0	0	44
12:45 PM	0	0	0	0	0	0	0	0	0	0	40	0	11	0	0	0	51
1:00 PM	0	0	0	0	0	0	0	0	0	0	15	0	8	0	0	0	23
1:15 PM	0	0	1	0	0	0	0	0	0	0	21	0	9	0	0	0	31
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	188	0	58	0	0	0	250
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	12:00 PM - 01:00 PM																TOTAL
PEAK HR VOL :	0	0	2	0	0	0	0	0	0	0	123	0	33	0	0	0	158
PEAK HR FACTOR :	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.769	0.000	0.750	0.000	0.000	0.000	0.775
	0.500								0.769				0.750				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	1 WL	2 WT	0 WR	0 WU	
3:30 PM	0	0	2	0	0	0	0	0	0	0	4	0	2	0	0	0	8
3:45 PM	0	0	0	0	0	0	0	0	0	0	5	0	3	0	0	0	8
4:00 PM	0	0	1	0	0	0	0	0	0	0	8	0	0	0	0	0	9
4:15 PM	0	0	4	0	0	0	0	0	0	0	1	0	4	0	0	0	9
4:30 PM	0	0	5	0	0	0	0	0	0	0	6	0	1	0	0	0	12
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	6	0	3	0	0	0	9
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
TOTAL VOLUMES :	0	0	12	0	0	0	0	0	0	0	32	0	15	0	0	0	59
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	03:45 PM - 04:45 PM																TOTAL
PEAK HR VOL :	0	0	10	0	0	0	0	0	0	0	20	0	8	0	0	0	38
PEAK HR FACTOR :	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.500	0.000	0.000	0.000	0.792
	0.500								0.625				0.500				

**ID:** 17-01217-001  
**City:** Yorba Linda

**Day:** Saturday  
**Date:** 10/21/2017



# National Data & Surveying Services

## Intersection Turning Movement Count

**Location:** Dwy 2 & Bastanchury Rd  
**City:** Yorba Linda  
**Control:** No Control

**Project ID:** 17-01217-002  
**Date:** 2017-10-21

### Total

NS/EW Streets:	Dwy 2				Dwy 2				Bastanchury Rd				Bastanchury Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	1 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	1 WL	2 WT	0 WR	0 WU	
11:30 AM	0	0	15	0	0	0	0	0	0	0	12	0	17	0	0	0	44
11:45 AM	0	0	15	0	0	0	0	0	0	0	9	0	20	0	0	0	44
12:00 PM	0	0	45	0	0	0	0	0	0	0	3	0	32	0	0	0	80
12:15 PM	0	0	18	0	0	0	0	0	0	0	11	0	40	0	0	0	69
12:30 PM	0	0	12	0	0	0	0	0	0	0	9	0	47	0	0	0	68
12:45 PM	0	0	13	0	0	0	0	0	0	0	6	0	52	0	0	0	71
1:00 PM	0	0	23	0	0	0	0	0	0	0	5	0	53	0	0	0	81
1:15 PM	0	0	23	0	0	0	0	0	0	0	6	0	34	0	0	0	63
TOTAL VOLUMES :	0	0	164	0	0	0	0	0	0	0	61	0	295	0	0	0	520
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	12:15 PM - 01:15 PM																TOTAL
PEAK HR VOL :	0	0	66	0	0	0	0	0	0	0	31	0	192	0	0	0	289
PEAK HR FACTOR :	0.000	0.000	0.717	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.705	0.000	0.906	0.000	0.000	0.000	0.892
	0.717								0.705				0.906				

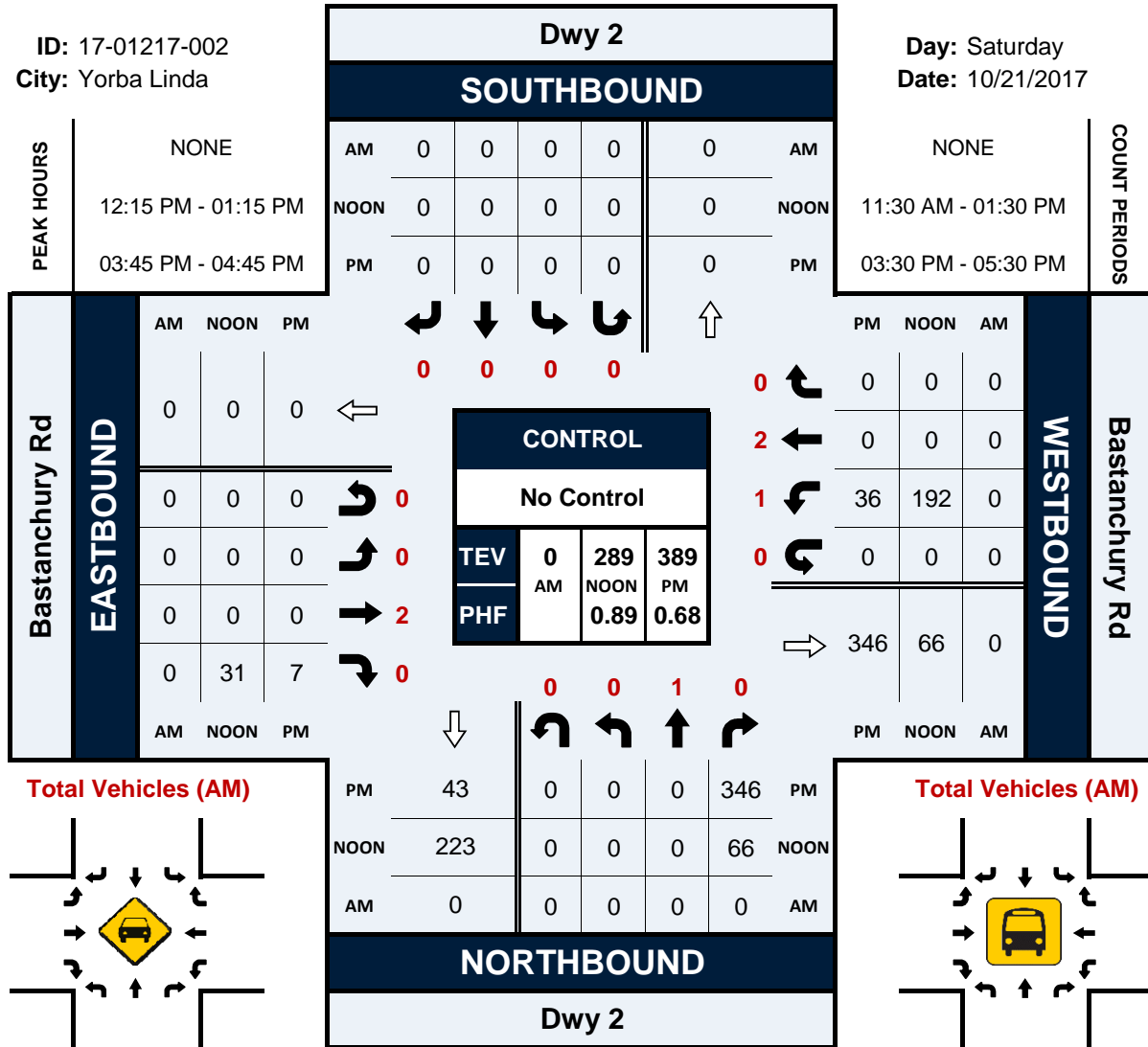
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	1 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	1 WL	2 WT	0 WR	0 WU	
3:30 PM	0	0	43	0	0	0	0	0	0	0	0	0	13	0	0	0	56
3:45 PM	0	0	37	0	0	0	0	0	0	0	2	0	7	0	0	0	46
4:00 PM	0	0	66	0	0	0	0	0	0	0	3	0	8	0	0	0	77
4:15 PM	0	0	138	0	0	0	0	0	0	0	0	0	5	0	0	0	143
4:30 PM	0	0	105	0	0	0	0	0	0	0	2	0	16	0	0	0	123
4:45 PM	0	0	14	0	0	0	0	0	0	0	0	0	2	0	0	0	16
5:00 PM	0	0	15	0	0	0	0	0	0	0	1	0	3	0	0	0	19
5:15 PM	0	0	25	0	0	0	0	0	0	0	2	0	5	0	0	0	32
TOTAL VOLUMES :	0	0	443	0	0	0	0	0	0	0	10	0	59	0	0	0	512
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	03:45 PM - 04:45 PM																TOTAL
PEAK HR VOL :	0	0	346	0	0	0	0	0	0	0	7	0	36	0	0	0	389
PEAK HR FACTOR :	0.000	0.000	0.627	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.583	0.000	0.563	0.000	0.000	0.000	0.680
	0.627								0.583				0.563				

# Dwy 2 & Bastanchury Rd

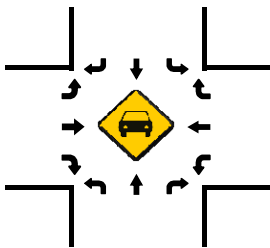
## Peak Hour Turning Movement Count

ID: 17-01217-002  
City: Yorba Linda

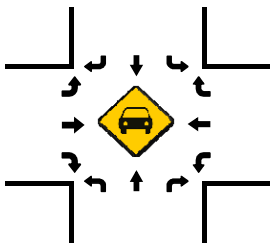
Day: Saturday  
Date: 10/21/2017



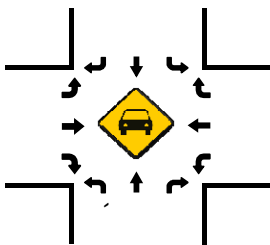
Total Vehicles (AM)



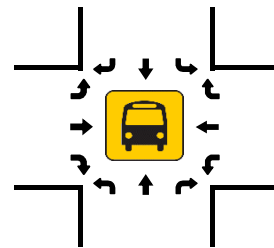
Total Vehicles (NOON)



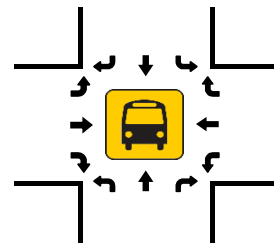
Total Vehicles (PM)



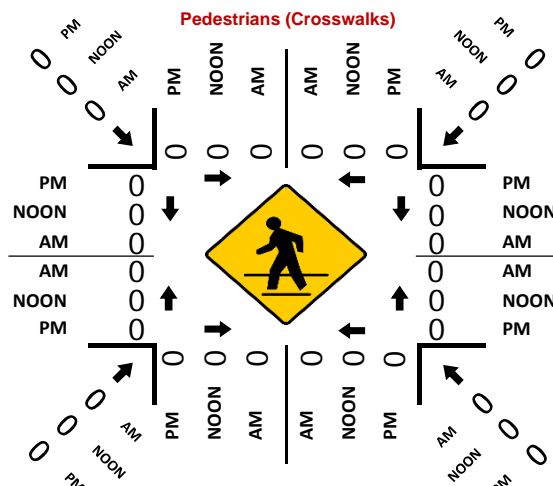
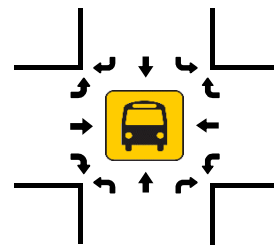
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



# National Data & Surveying Services

## Intersection Turning Movement Count

**Location:** Dwy 3 & Bastanchury Rd  
**City:** Yorba Linda  
**Control:** No Control

**Project ID:** 17-01217-003  
**Date:** 2017-10-21

### Total

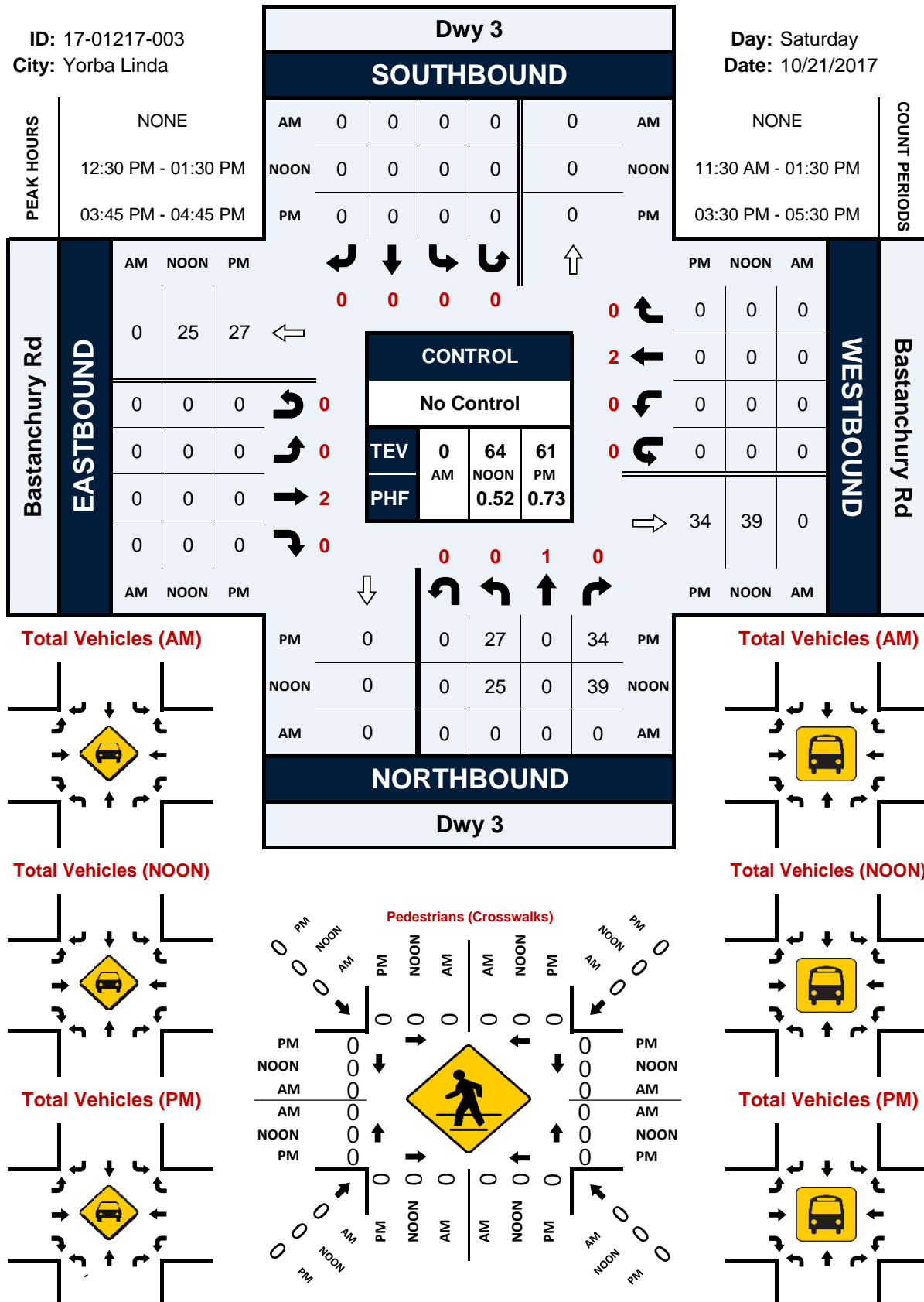
NS/EW Streets:	Dwy 3				Dwy 3				Bastanchury Rd				Bastanchury Rd				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	1 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	0 WL	2 WT	0 WR	0 WU	
11:30 AM	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
11:45 AM	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:00 PM	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	7
12:15 PM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
12:30 PM	5	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	15
12:45 PM	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6
1:00 PM	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	12
1:15 PM	13	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	31
TOTAL VOLUMES :	NL 37	NT 0	NR 47	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 84
APPROACH %'s :	44.05%	0.00%	55.95%	0.00%													
PEAK HR :	12:30 PM - 01:30 PM																TOTAL
PEAK HR VOL :	25	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	64
PEAK HR FACTOR :	0.481	0.000	0.542	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.516
	0.516																

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	1 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	2 ET	0 ER	0 EU	0 WL	2 WT	0 WR	0 WU	
3:30 PM	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	9
3:45 PM	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	10
4:00 PM	9	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	12
4:15 PM	7	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	21
4:30 PM	6	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	18
4:45 PM	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL 38	NT 0	NR 46	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 84
APPROACH %'s :	45.24%	0.00%	54.76%	0.00%													
PEAK HR :	03:45 PM - 04:45 PM																TOTAL
PEAK HR VOL :	27	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	61
PEAK HR FACTOR :	0.750	0.000	0.607	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.726
	0.726																



**Day:** Saturday  
**Date:** 10/21/2017



## APPENDIX D

### CUMULATIVE PROJECT TRAFFIC VOLUMES

*APPENDIX D-1*

**YEAR 2020 WEEKDAY PM PEAK HOUR  
CUMULATIVE PROJECT TRAFFIC VOLUMES**

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#560 YORBA LINDA BLVD/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	0	0	0	0	0	0	0	1	0	0	1	0	2
#561 CHAPMAN AVE/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	5	0	0	13	0	18
Total	0	0	0	0	0	0	0	5	0	0	13	0	18
#562 KRAEMER BLVD/CROWTHER AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#563 ORANGETHORPE AVE/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	8	0	0	18	0	26
Total	0	0	0	0	0	0	0	8	0	0	18	0	26
#16 #1001 HARBOR BLVD/COMMONWEALTH AVE													
Base	152	1060	156	84	1156	140	148	604	152	176	824	116	4768
Added	34	9	3	0	11	9	3	5	11	6	13	0	104
Total	186	1069	159	84	1167	149	151	609	163	182	837	116	4872
#7 #1004 HARBOR BLVD/CHAPMAN AVE													
Base	128	1076	164	148	1024	184	252	832	116	228	912	168	5232
Added	0	12	0	2	20	0	0	2	0	0	1	1	38
Total	128	1088	164	150	1044	184	252	834	116	228	913	169	5270
#3 #1006 HARBOR BLVD/BERKELEY AVE													
Base	116	1560	52	280	1284	28	64	196	224	80	200	532	4616
Added	0	13	0	0	21	0	0	0	0	0	0	0	34
Total	116	1573	52	280	1305	28	64	196	224	80	200	532	4650
#2 #1008 HARBOR BLVD/BREA BLVD-WEST VALLEY VIEW DR													
Base	60	1388	532	128	1272	80	108	192	64	584	160	168	4736
Added	0	12	1	0	20	0	0	0	0	1	0	0	34
Total	60	1400	533	128	1292	80	108	192	64	585	160	168	4770
#1 #1010 HARBOR BLVD/BASTANCHURY RD													
Base	312	1152	260	480	1064	320	352	1152	220	264	968	352	6896
Added	4	8	0	0	19	2	1	1	2	0	2	0	39
Total	316	1160	260	480	1083	322	353	1153	222	264	970	352	6935

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#6 #1051	EUCLID ST/MALVERN AVE												
Base	192	1168	164	160	1016	40	44	808	152	216	708	112	4780
Added	0	9	0	1	12	0	0	1	0	0	1	1	25
Total	192	1177	164	161	1028	40	44	809	152	216	709	113	4805
#1053	EUCLID ST/BASTANCHURY RD												
Base	124	1172	304	452	664	108	140	760	72	300	684	504	5284
Added	0	4	6	1	10	0	0	4	0	3	2	0	30
Total	124	1176	310	453	674	108	140	764	72	303	686	504	5314
#1058	CHAPMAN AVE/COMMONWEALTH AVE												
Base	36	236	408	80	232	168	108	1208	56	308	1180	148	4168
Added	0	3	5	0	6	0	0	0	0	13	0	0	27
Total	36	239	413	80	238	168	108	1208	56	321	1180	148	4195
#1062	ROSECRANS AVE/GILBERT ST												
Base	176	792	104	80	376	192	280	572	160	124	572	100	3528
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	176	792	104	80	376	192	280	572	160	124	572	100	3528
#1063	GILBERT ST/PIONEER AVE												
Base	80	710	50	20	410	30	20	10	30	30	10	10	1410
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	80	710	50	20	410	30	20	10	30	30	10	10	1410
#1065	CHAPMAN AVE/HIGHLAND AVE												
Base	140	190	220	30	150	60	50	1140	120	170	1010	50	3330
Added	0	0	0	0	0	0	0	2	0	0	1	0	3
Total	140	190	220	30	150	60	50	1142	120	170	1011	50	3333
#8 #1070	CHAPMAN AVE/LEMON ST												
Base	144	772	176	124	480	116	312	896	108	220	936	160	4444
Added	0	0	0	0	0	0	0	3	0	0	2	0	5
Total	144	772	176	124	480	116	312	899	108	220	938	160	4449
#9 #1074	CHAPMAN AVE/BERKELEY AVE												
Base	20	72	32	420	56	116	112	916	24	72	1216	440	3496
Added	0	0	0	0	0	0	0	3	0	0	2	0	5
Total	20	72	32	420	56	116	112	919	24	72	1218	440	3501
#4 #1076	LEMON ST/BERKELEY AVE												
Base	352	584	176	152	368	24	40	320	180	112	444	140	2892
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	352	584	176	152	368	24	40	320	180	112	444	140	2892

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1520 ORANGETHORPE AVE/SR-57 SB RAMPS													
Base	28	12	28	156	4	268	372	1172	44	20	1332	288	3724
Added	0	0	0	0	0	1	1	9	0	0	19	0	30
Total	28	12	28	156	4	269	373	1181	44	20	1351	288	3754
#1521 ORANGETHORPE AVE/SR-57 NB RAMPS													
Base	480	0	672	0	0	0	364	1000	0	0	1008	748	4272
Added	1	0	0	0	0	0	1	8	0	0	18	0	28
Total	481	0	672	0	0	0	365	1008	0	0	1026	748	4300
#1522													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	1	0	1	0	0	0	0	0	0	0	2
Total	0	0	1	0	1	0	0	0	0	0	0	0	2
#1523													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	1	0	0	1	0	0	1	3
Total	0	0	0	0	0	1	0	0	1	0	0	1	3
#1564 VALENCIA MESA DR/ST JUDE AVE													
Base	60	28	8	40	12	156	104	132	52	12	392	68	1064
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	60	28	8	40	12	156	104	132	52	12	392	68	1064
#5 #1574 BERKELEY AVE/HORNET WY													
Base	0	0	4	48	0	168	176	416	0	0	456	32	1300
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	48	0	168	176	416	0	0	456	32	1300
#30 #1575 BERKELEY AVE/BROOKDALE PL													
Base	0	440	32	52	516	0	0	0	0	32	0	52	1124
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	440	32	52	516	0	0	0	0	32	0	52	1124
#1584 LEMON ST/WALNUT WAY													
Base	60	1564	0	0	1172	48	28	0	92	0	0	0	2964
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	60	1564	0	0	1172	48	28	0	92	0	0	0	2964
#1585 HIGHLAND AVE/WALNUT AVE													
Base	8	388	16	40	424	80	76	20	12	36	32	64	1196
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	8	388	16	40	424	80	76	20	12	36	32	64	1196

None

Tue Jan 17, 2017 15:38:36

Page 2-21

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1079 COMMONWEALTH AVE/HIGHLAND AVE													
Base	70	230	190	90	210	120	120	1120	100	150	1000	80	3480
Added	0	0	0	0	0	0	0	18	0	0	56	0	74
Total	70	230	190	90	210	120	120	1138	100	150	1056	80	3554
#17 #1082 COMMONWEALTH AVE/LEMON ST													
Base	144	832	224	60	660	132	132	680	160	276	996	76	4372
Added	0	0	0	0	0	0	0	8	0	0	19	0	27
Total	144	832	224	60	660	132	132	688	160	276	1015	76	4399
#1083 STATE COLLEGE BLVD/ROLLING HILLS DR													
Base	112	644	16	10	560	92	44	10	80	40	12	32	1652
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	112	644	16	10	560	92	44	10	80	40	12	32	1652
#1084 STATE COLLEGE BLVD/BASTANCHURY RD													
Base	660	1128	60	176	564	208	340	1140	340	48	1008	260	5932
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	660	1128	60	176	564	208	340	1140	340	48	1008	260	5932
#1085 STATE COLLEGE BLVD/YORBA LINDA BLVD													
Base	32	1192	792	292	588	96	76	192	36	684	152	316	4448
Added	0	0	1	0	0	0	0	0	0	1	0	0	2
Total	32	1192	793	292	588	96	76	192	36	685	152	316	4450
#10 #1089 CHAPMAN AVE/RAYMOND AVE													
Base	272	268	216	124	192	84	88	1004	168	144	1232	124	3916
Added	2	1	0	0	1	0	0	0	3	0	0	0	7
Total	274	269	216	124	193	84	88	1004	171	144	1232	124	3923
#11 #1091 CHAPMAN AVE/ACACIA AVE													
Base	210	150	150	50	110	70	70	1250	110	120	1530	80	3900
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	210	150	150	50	110	70	70	1250	110	120	1530	80	3900
#1092 COMMONWEALTH AVE/RAYMOND AVE													
Base	260	676	128	104	312	120	176	624	148	116	836	108	3608
Added	0	3	0	0	4	0	0	8	0	0	19	0	34
Total	260	679	128	104	316	120	176	632	148	116	855	108	3642
#1093 COMMONWEALTH AVE/ACACIA AVE													
Base	250	410	170	60	180	130	90	930	130	60	650	50	3110
Added	0	0	0	0	0	0	0	8	0	0	19	0	27
Total	250	410	170	60	180	130	90	938	130	60	669	50	3137



None

Tue Jan 17, 2017 15:38:36

Page 2-18

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1014 MALVERN AVE/GILBERT ST													
Base	184	608	440	160	520	188	232	792	100	408	1032	188	4852
Added	0	0	2	0	0	0	0	2	0	1	1	0	6
Total	184	608	442	160	520	188	232	794	100	409	1033	188	4858
#1017 MAGNOLIA AVE/VALENCIA DR													
Base	212	796	148	92	784	60	24	308	148	108	268	88	3036
Added	0	2	0	0	1	0	0	0	0	0	0	0	3
Total	212	798	148	92	785	60	24	308	148	108	268	88	3039
#1018 COMMONWEALTH AVE/MAGNOLIA AVE													
Base	312	0	396	16	20	20	0	696	192	448	556	4	2660
Added	0	0	2	0	0	0	0	10	0	1	2	0	15
Total	312	0	398	16	20	20	0	706	192	449	558	4	2675
#1020 ORANGETHORPE AVE/MAGNOLIA AVE													
Base	276	908	360	120	876	80	128	468	300	212	632	144	4504
Added	0	2	1	0	1	0	0	11	0	1	5	0	21
Total	276	910	361	120	877	80	128	479	300	213	637	144	4525
#1021 COMMONWEALTH AVE/BROOKHURST RD													
Base	512	24	440	12	24	12	8	496	504	408	608	16	3064
Added	0	0	0	0	0	0	0	10	0	0	2	0	12
Total	512	24	440	12	24	12	8	506	504	408	610	16	3076
#1023 BROOKHURST RD/VALENCIA DR													
Base	144	804	108	96	700	84	104	264	104	140	284	96	2928
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	144	804	108	96	700	84	104	264	104	140	284	96	2928
#1024 ORANGETHORPE AVE/BROOKHURST RD													
Base	200	1004	232	116	812	88	184	668	176	260	708	140	4588
Added	0	0	1	0	0	0	0	13	0	1	6	0	21
Total	200	1004	233	116	812	88	184	681	176	261	714	140	4609
#1026 STATE COLLEGE BLVD/NUTWOOD AVE													
Base	44	1680	256	276	1408	88	64	96	36	328	96	332	4704
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	44	1681	256	276	1409	88	64	96	36	328	96	332	4706
#1027 STATE COLLEGE BLVD/CHAPMAN AVE													
Base	228	1292	268	276	696	536	468	992	144	164	884	428	6376
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	228	1293	268	276	697	536	468	992	144	164	884	428	6378

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None

Tue Jan 17, 2017 15:38:36

Page 2-24

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1307 IMPERIAL HWY/SR-57 NB OFF RAMP-BREA PLAZA													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#1309 YORBA LINDA BLVD/SR-57 SB OFF RAMP													
Base	0	0	0	872	0	212	0	964	532	0	1772	528	4880
Added	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	0	0	0	872	0	212	0	965	532	0	1773	528	4882
#1310 YORBA LINDA BLVD/SR-57 NB OFF RAMP													
Base	536	0	696	0	0	0	0	1452	156	0	1568	308	4716
Added	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	536	0	696	0	0	0	0	1453	156	0	1569	308	4718
#1311 NUTWOOD AVE/SR-57 SB RAMPS													
Base	0	0	0	168	256	316	0	848	772	152	692	0	3204
Added	0	0	0	0	0	6	0	3	0	0	0	0	9
Total	0	0	0	168	256	322	0	851	772	152	692	0	3213
#1312 NUTWOOD AVE/SR-57 NB RAMPS													
Base	392	472	256	0	0	0	412	596	0	0	432	116	2676
Added	0	0	0	0	0	0	3	0	0	0	0	0	3
Total	392	472	256	0	0	0	415	596	0	0	432	116	2679
#1313 CHAPMAN AVE/SR-57 SB RAMPS													
Base	0	0	0	152	28	224	0	1108	488	440	1300	0	3740
Added	0	0	0	0	0	0	0	5	0	0	13	0	18
Total	0	0	0	152	28	224	0	1113	488	440	1313	0	3758
#1314 CHAPMAN AVE/SR-57 NB RAMPS													
Base	444	88	356	0	0	0	212	936	0	0	1144	288	3468
Added	0	0	0	0	0	0	0	5	0	0	13	0	18
Total	444	88	356	0	0	0	212	941	0	0	1157	288	3486
#1315 MAGNOLIA AVE/SR-91 WB RAMPS													
Base	236	1288	0	0	1172	328	0	0	0	484	0	180	3688
Added	0	3	0	0	2	0	0	0	0	0	0	0	5
Total	236	1291	0	0	1174	328	0	0	0	484	0	180	3693
#1317 BROOKHURST/SR-91 WB RAMPS													
Base	180	1276	0	0	1104	336	0	0	0	492	0	328	3716
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	180	1277	0	0	1105	336	0	0	0	492	0	328	3718

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None

Tue Jan 17, 2017 15:38:35

Page 2-11

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#281													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#283 EUCLID ST/HILL AVE-SOUTHGATE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	28	0	0	11	0	0	0	0	0	0	0	39
Total	0	28	0	0	11	0	0	0	0	0	0	0	39
#285 CHAPMAN AVE/MALDEN AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	2	0	0	1	0	3
Total	0	0	0	0	0	0	0	2	0	0	1	0	3
#286 COMMONWEALTH AVE/MALDEN AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	18	0	0	56	0	74
Total	0	0	0	0	0	0	0	18	0	0	56	0	74
#295 CHAPMAN AVE/POMONA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	3	0	0	2	0	5
Total	0	0	0	0	0	0	0	3	0	0	2	0	5
#296 COMMONWEALTH AVE/POMONA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	8	0	0	19	0	27
Total	0	0	0	0	0	0	0	8	0	0	19	0	27
#297 LEMON ST/WILSHIRE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#298 VALENCIA DR/POMONA AVE													
Base	48	16	140	28	8	24	16	212	16	36	284	16	844
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	16	140	28	8	24	16	212	16	36	284	16	844
#320 STATE COLLEGE BLVD/WALNUT AVE													
Base	148	1068	72	148	888	48	44	0	92	44	0	316	2868
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	148	1069	72	148	889	48	44	0	92	44	0	316	2870

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None

Tue Jan 17, 2017 15:38:35

Page 2-4

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#99 HARBOR BLVD/LAS PALMAS DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	9	0	0	20	0	0	0	0	0	0	0	29
Total	0	9	0	0	20	0	0	0	0	0	0	0	29
#100 HARBOR BLVD/HERMOSA DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	9	0	0	20	0	0	0	0	0	0	0	29
Total	0	9	0	0	20	0	0	0	0	0	0	0	29
#101 HARBOR BLVD/VALENCIA MESA DR													
Base	144	1312	124	144	968	168	208	72	312	240	152	320	4164
Added	0	12	0	0	20	0	0	0	0	0	0	0	32
Total	144	1324	124	144	988	168	208	72	312	240	152	320	4196
#102 HARBOR BLVD/EAST VALLEY VIEW DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	13	0	0	21	0	0	0	0	0	0	0	34
Total	0	13	0	0	21	0	0	0	0	0	0	0	34
#104 HARBOR BLVD/UNION AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	13	0	0	21	0	0	0	0	0	0	0	34
Total	0	13	0	0	21	0	0	0	0	0	0	0	34
#105 HARBOR BLVD/WILSHIRE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	12	0	0	20	0	0	0	0	0	0	0	32
Total	0	12	0	0	20	0	0	0	0	0	0	0	32
#106 HARBOR BLVD/AMERIGE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	12	0	0	20	0	0	0	0	0	0	0	32
Total	0	12	0	0	20	0	0	0	0	0	0	0	32
#107 HARBOR BLVD/VALENCIA DR													
Base	92	1364	72	32	1436	56	76	112	116	72	152	44	3624
Added	0	46	0	0	27	0	0	0	0	0	0	0	73
Total	92	1410	72	32	1463	56	76	112	116	72	152	44	3697
#108 HARBOR BLVD/SOUTHGATE AVE/COSTCO													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	73	0	0	34	0	0	0	0	0	0	0	107
Total	0	73	0	0	34	0	0	0	0	0	0	0	107

None

Tue Jan 17, 2017 15:38:35

Page 2-5

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#109 HARBOR BLVD/ORANGEFAIR AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	51	0	0	23	0	0	0	0	0	0	0	74
Total	0	51	0	0	23	0	0	0	0	0	0	0	74
#111 IMPERIAL HWY/MERVYN'S DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#112 BASTANCHURY RD/BALBOA RD/ST JUDE AVE													
Base	44	16	172	16	0	20	16	1672	52	100	1500	20	3628
Added	0	0	0	0	0	0	0	1	0	0	2	0	3
Total	44	16	172	16	0	20	16	1673	52	100	1502	20	3631
#113 LAMBERT RD/PALM ST													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#115 BASTANCHURY RD/PUENTE ST													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	1	0	0	2	0	3
Total	0	0	0	0	0	0	0	1	0	0	2	0	3
#116 BREA BLVD/LEMON ST													
Base	92	20	336	28	24	24	28	1116	84	260	640	12	2664
Added	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	92	20	336	28	24	24	28	1117	84	260	641	12	2666
#118 LEMON ST/VALENCIA DR													
Base	92	1264	68	96	1076	104	96	64	116	92	56	76	3200
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	92	1264	68	96	1076	104	96	64	116	92	56	76	3200
#119 LEMON ST/ORANGEFAIR AVE													
Base	148	1524	92	164	1208	132	172	96	120	188	80	128	4052
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	148	1524	92	164	1208	132	172	96	120	188	80	128	4052
#126 COMMONWEALTH AVE/BERKELEY AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	8	0	0	19	0	27
Total	0	0	0	0	0	0	0	8	0	0	19	0	27

None

Tue Jan 17, 2017 15:38:36

Page 2-19

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1028 STATE COLLEGE BLVD/COMMONWEALTH AVE													
Base	348	908	112	56	916	180	228	368	156	112	488	100	3972
Added	0	1	0	0	1	0	0	8	0	0	19	0	29
Total	348	909	112	56	917	180	228	376	156	112	507	100	4001
#1030 BREA BLVD/ROLLING HILLS DR													
Base	40	540	40	70	600	380	40	60	60	90	60	50	2030
Added	0	1	0	0	3	0	0	0	0	0	0	0	4
Total	40	541	40	70	603	380	40	60	60	90	60	50	2034
#1031 BASTANCHURY RD/BREA BLVD													
Base	116	1156	432	268	788	304	544	1496	140	424	1284	432	7384
Added	0	1	0	0	1	2	1	0	0	0	0	0	5
Total	116	1157	432	268	789	306	545	1496	140	424	1284	432	7389
#1035 HARBOR BLVD/ORANGETHORPE AVE													
Base	308	1384	284	228	1164	248	316	680	228	356	972	288	6456
Added	0	50	1	8	23	3	6	4	0	1	3	18	117
Total	308	1434	285	236	1187	251	322	684	228	357	975	306	6573
#1037 ORANGETHORPE AVE/LEMON ST													
Base	256	1092	168	176	940	156	204	736	188	284	1020	200	5420
Added	0	0	0	0	0	0	0	13	0	0	21	0	34
Total	256	1092	168	176	940	156	204	749	188	284	1041	200	5454
#1042 EUCLID ST/ORANGETHORPE AVE													
Base	220	1188	252	200	1060	164	148	752	148	256	948	220	5556
Added	0	24	1	0	9	2	4	9	0	1	5	0	55
Total	220	1212	253	200	1069	166	152	761	148	257	953	220	5611
#1044 EUCLID ST/VALENCIA DR													
Base	104	1084	100	148	1012	224	204	216	100	164	260	164	3780
Added	0	28	0	0	11	0	0	0	0	0	0	0	39
Total	104	1112	100	148	1023	224	204	216	100	164	260	164	3819
#1045 COMMONWEALTH AVE/GILBERT ST													
Base	40	268	72	516	264	756	528	416	56	160	556	572	4204
Added	0	0	0	0	0	1	2	10	0	0	2	0	15
Total	40	268	72	516	264	757	530	426	56	160	558	572	4219
#1049 EUCLID ST/COMMONWEALTH AVE													
Base	108	1404	264	88	1000	172	232	552	84	252	664	168	4988
Added	0	7	19	8	4	0	0	10	0	7	1	3	59
Total	108	1411	283	96	1004	172	232	562	84	259	665	171	5047

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1318 BROOKHURST/SR-91 EB RAMPS													
Base	0	984	528	296	1256	0	516	0	236	0	0	0	3816
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	0	985	528	296	1257	0	516	0	236	0	0	0	3818
#1319 EUCLID ST/SR-91 WB RAMPS													
Base	300	1536	0	0	1164	328	0	0	0	568	0	404	4300
Added	0	25	0	0	8	2	0	0	0	0	0	0	35
Total	300	1561	0	0	1172	330	0	0	0	568	0	404	4335
#1320 EUCLID ST/SR-91 EB RAMPS													
Base	0	1416	856	288	1496	0	416	0	368	0	0	0	4840
Added	0	21	0	0	8	0	4	0	0	0	0	0	33
Total	0	1437	856	288	1504	0	420	0	368	0	0	0	4873
#22 #1321 HARBOR BLVD/SR-91 WB RAMPS													
Base	236	1416	0	0	1108	516	0	0	0	240	288	212	4016
Added	0	39	0	0	18	5	0	0	0	0	0	12	74
Total	236	1455	0	0	1126	521	0	0	0	240	288	224	4090
#24 #1322 HARBOR BLVD/SR-91 EB RAMPS													
Base	0	1484	424	328	1136	0	488	212	208	0	0	0	4280
Added	0	30	0	6	12	0	9	0	0	0	0	0	57
Total	0	1514	424	334	1148	0	497	212	208	0	0	0	4337
#23 #1323 LEMON ST/ANAHEIM BLVD/SR-91 WB RAMPS													
Base	172	1296	0	0	1284	256	0	0	0	168	404	500	4080
Added	0	0	0	0	0	0	0	0	0	0	12	0	12
Total	172	1296	0	0	1284	256	0	0	0	168	416	500	4092
#25 #1324 LEMON ST/ANAHEIM BLVD/SR-91 EB RAMPS													
Base	0	1052	344	596	744	0	340	576	80	0	0	0	3732
Added	0	0	0	0	0	0	0	6	0	0	0	0	6
Total	0	1052	344	596	744	0	340	582	80	0	0	0	3738
#1325 RAYMOND AVE/SR-91 WB RAMPS													
Base	440	800	0	0	940	504	0	0	0	180	0	284	3148
Added	0	4	0	0	2	2	0	0	0	0	0	3	11
Total	440	804	0	0	942	506	0	0	0	180	0	287	3159
#1326 RAYMOND AVE/SR-91 EB RAMPS													
Base	0	876	336	444	580	0	380	0	436	0	0	0	3052
Added	0	1	0	2	1	0	3	0	0	0	0	0	7
Total	0	877	336	446	581	0	383	0	436	0	0	0	3059



None

Tue Jan 17, 2017 15:38:35

Page 2-10

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#242 HARBOR BLVD/SANTA FE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	46	0	0	27	0	0	0	0	0	0	0	73
Total	0	46	0	0	27	0	0	0	0	0	0	0	73
#243 HARBOR BLVD/ORANGEFAIR MALL													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	51	0	0	23	0	0	0	0	0	0	0	74
Total	0	51	0	0	23	0	0	0	0	0	0	0	74
#244 ORANGETHORPE AVE/POMONA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	13	0	0	21	0	34
Total	0	0	0	0	0	0	0	13	0	0	21	0	34
#247 LEMON ST/NUTWOOD PL													
Base	32	836	140	96	576	16	32	4	64	144	8	148	2096
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	836	140	96	576	16	32	4	64	144	8	148	2096
#248 BERKELEY AVE/EAST-OF-LEMON ST DWY													
Base	0	0	72	0	0	0	0	472	64	0	612	0	1220
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	72	0	0	0	0	472	64	0	612	0	1220
#250 BERKELEY AVE/NORTH-OF-BROOKDALE PL DWY													
Base	68	0	0	0	0	20	56	0	172	0	0	0	316
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	0	0	0	0	20	56	0	172	0	0	0	316
#257 COMMONWEALTH AVE/PRITCHARD AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	13	0	0	3	0	16
Total	0	0	0	0	0	0	0	13	0	0	3	0	16
#272													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#273													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	4	0	0	11	0	0	0	0	0	0	0	15
Total	0	4	0	0	11	0	0	0	0	0	0	0	15

None

Tue Jan 17, 2017 15:38:35

Page 2-12

Opening Day  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#328 YORBA LINDA BLVD/ALMIRA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	1	0	0	1	0	2
Total	0	0	0	0	0	0	0	1	0	0	1	0	2
#331 COMMONWEALTH AVE/COLLEGE PL													
Base	0	550	0	0	400	0	0	0	0	0	0	0	950
Added	0	3	0	0	6	0	0	0	0	0	0	0	9
Total	0	553	0	0	406	0	0	0	0	0	0	0	959
#345													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	15	0	0	8	0	23
Total	0	0	0	0	0	0	0	15	0	0	8	0	23
#349													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	15	0	0	8	0	23
Total	0	0	0	0	0	0	0	15	0	0	8	0	23
#360													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	4	0	0	7	0	0	0	0	0	0	0	11
Total	0	4	0	0	7	0	0	0	0	0	0	0	11
#27 #364 LEMON AVE/GROVE PL													
Base	84	916	80	72	680	36	4	0	4	88	0	80	2044
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	916	80	72	680	36	4	0	4	88	0	80	2044
#366 IMPERIAL HWY/STATE COLLEGE BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#367 IMPERIAL HWY/BREA BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	1	0	0	3	0	0	0	0	0	0	0	4
Total	0	1	0	0	3	0	0	0	0	0	0	0	4
#369 STATE COLLEGE BLVD/SR-91 EB RAMPS													
Base	0	1100	240	404	912	0	312	0	308	0	0	0	3276
Added	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	0	1101	240	404	913	0	312	0	308	0	0	0	3278



*APPENDIX D-II*

**YEAR 2030 WEEKDAY PM PEAK HOUR  
CUMULATIVE PROJECT TRAFFIC VOLUMES**

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#560 YORBA LINDA BLVD/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	25	0	0	22	0	47
Total	0	0	0	0	0	0	0	25	0	0	22	0	47
#561 CHAPMAN AVE/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	259	0	0	161	0	420
Total	0	0	0	0	0	0	0	259	0	0	161	0	420
#562 KRAEMER BLVD/CROWTHER AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#563 ORANGETHORPE AVE/KRAEMER BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	17	0	0	31	0	48
Total	0	0	0	0	0	0	0	17	0	0	31	0	48
#16 #1001 HARBOR BLVD/COMMONWEALTH AVE													
Base	152	1060	156	84	1156	140	148	604	152	176	824	116	4768
Added	111	349	76	65	625	39	20	148	89	63	370	65	2020
Total	263	1409	232	149	1781	179	168	752	241	239	1194	181	6788
#7 #1004 HARBOR BLVD/CHAPMAN AVE													
Base	128	1076	164	148	1024	184	252	832	116	228	912	168	5232
Added	42	273	72	60	527	15	15	193	46	80	272	49	1644
Total	170	1349	236	208	1551	199	267	1025	162	308	1184	217	6876
#3 #1006 HARBOR BLVD/BERKELEY AVE													
Base	116	1560	52	280	1284	28	64	196	224	80	200	532	4616
Added	-53	393	0	23	658	-16	-14	0	-56	0	0	14	949
Total	63	1953	52	303	1942	12	50	196	168	80	200	546	5565
#2 #1008 HARBOR BLVD/BREA BLVD-WEST VALLEY VIEW DR													
Base	60	1388	532	128	1272	80	108	192	64	584	160	168	4736
Added	-16	366	42	6	636	-12	-11	-7	-23	53	-3	12	1043
Total	44	1754	574	134	1908	68	97	185	41	637	157	180	5779
#1 #1010 HARBOR BLVD/BASTANCHURY RD													
Base	312	1152	260	480	1064	320	352	1152	220	264	968	352	6896
Added	43	351	44	37	474	56	67	110	91	56	86	19	1434
Total	355	1503	304	517	1538	376	419	1262	311	320	1054	371	8330

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 Future Build-Out  
 Default Trip Distribution  
 PM Trips  
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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#6 #1051	EUCLID ST/MALVERN AVE												
Base	192	1168	164	160	1016	40	44	808	152	216	708	112	4780
Added	34	111	25	47	105	8	3	202	31	15	263	44	888
Total	226	1279	189	207	1121	48	47	1010	183	231	971	156	5668
#1053	EUCLID ST/BASTANCHURY RD												
Base	124	1172	304	452	664	108	140	760	72	300	684	504	5284
Added	0	114	39	40	111	-1	3	35	0	43	42	52	478
Total	124	1286	343	492	775	107	143	795	72	343	726	556	5762
#1058	CHAPMAN AVE/COMMONWEALTH AVE												
Base	36	236	408	80	232	168	108	1208	56	308	1180	148	4168
Added	0	3	90	143	51	557	171	531	0	56	373	52	2027
Total	36	239	498	223	283	725	279	1739	56	364	1553	200	6195
#1062	ROSECRANS AVE/GILBERT ST												
Base	176	792	104	80	376	192	280	572	160	124	572	100	3528
Added	108	155	0	0	108	0	0	56	82	0	61	0	570
Total	284	947	104	80	484	192	280	628	242	124	633	100	4098
#1063	GILBERT ST/PIONEER AVE												
Base	80	710	50	20	410	30	20	10	30	30	10	10	1410
Added	0	263	0	0	189	0	0	0	0	0	0	0	452
Total	80	973	50	20	599	30	20	10	30	30	10	10	1862
#1065	CHAPMAN AVE/HIGHLAND AVE												
Base	140	190	220	30	150	60	50	1140	120	170	1010	50	3330
Added	27	0	11	0	0	0	0	259	33	22	320	0	672
Total	167	190	231	30	150	60	50	1399	153	192	1330	50	4002
#8 #1070	CHAPMAN AVE/LEMON ST												
Base	144	772	176	124	480	116	312	896	108	220	936	160	4444
Added	16	40	77	1	50	0	0	306	21	165	387	3	1066
Total	160	812	253	125	530	116	312	1202	129	385	1323	163	5510
#9 #1074	CHAPMAN AVE/BERKELEY AVE												
Base	20	72	32	420	56	116	112	916	24	72	1216	440	3496
Added	0	0	16	0	0	0	0	387	0	21	555	0	979
Total	20	72	48	420	56	116	112	1303	24	93	1771	440	4475
#4 #1076	LEMON ST/BERKELEY AVE												
Base	352	584	176	152	368	24	40	320	180	112	444	140	2892
Added	12	31	0	0	33	2	5	0	18	0	0	0	101
Total	364	615	176	152	401	26	45	320	198	112	444	140	2993

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1520 ORANGETHORPE AVE/SR-57 SB RAMPS													
Base	28	12	28	156	4	268	372	1172	44	20	1332	288	3724
Added	4	0	0	0	0	24	165	354	0	0	74	0	621
Total	32	12	28	156	4	292	537	1526	44	20	1406	288	4345
#1521 ORANGETHORPE AVE/SR-57 NB RAMPS													
Base	480	0	672	0	0	0	364	1000	0	0	1008	748	4272
Added	43	0	0	0	0	0	119	17	0	0	31	0	210
Total	523	0	672	0	0	0	483	1017	0	0	1039	748	4482
#1522													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	533	43	0	956	0	0	0	0	0	0	0	1532
Total	0	533	43	0	956	0	0	0	0	0	0	0	1532
#1523													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	533	0	0	792	24	0	0	165	0	0	119	1633
Total	0	533	0	0	792	24	0	0	165	0	0	119	1633
#1564 VALENCIA MESA DR/ST JUDE AVE													
Base	60	28	8	40	12	156	104	132	52	12	392	68	1064
Added	0	0	0	0	0	154	58	0	0	0	0	0	212
Total	60	28	8	40	12	310	162	132	52	12	392	68	1276
#5 #1574 BERKELEY AVE/HORNET WY													
Base	0	0	4	48	0	168	176	416	0	0	456	32	1300
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	48	0	168	176	416	0	0	456	32	1300
#30 #1575 BERKELEY AVE/BROOKDALE PL													
Base	0	440	32	52	516	0	0	0	0	32	0	52	1124
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	440	32	52	516	0	0	0	0	32	0	52	1124
#1584 LEMON ST/WALNUT WAY													
Base	60	1564	0	0	1172	48	28	0	92	0	0	0	2964
Added	5	179	0	0	391	20	0	0	-1	0	0	0	594
Total	65	1743	0	0	1563	68	28	0	91	0	0	0	3558
#1585 HIGHLAND AVE/WALNUT AVE													
Base	8	388	16	40	424	80	76	20	12	36	32	64	1196
Added	0	97	5	1	83	0	0	0	0	0	0	1	187
Total	8	485	21	41	507	80	76	20	12	36	32	65	1383

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1079 COMMONWEALTH AVE/HIGHLAND AVE													
Base	70	230	190	90	210	120	120	1120	100	150	1000	80	3480
Added	11	63	23	7	62	0	0	179	4	18	449	23	839
Total	81	293	213	97	272	120	120	1299	104	168	1449	103	4319
#1082 COMMONWEALTH AVE/LEMON ST													
Base	144	832	224	60	660	132	132	680	160	276	996	76	4372
Added	5	48	48	-1	197	26	74	246	20	152	471	1	1287
Total	149	880	272	59	857	158	206	926	180	428	1467	77	5659
#1083 STATE COLLEGE BLVD/ROLLING HILLS DR													
Base	112	644	16	10	560	92	44	10	80	40	12	32	1652
Added	0	209	0	0	97	0	0	0	0	0	0	0	306
Total	112	853	16	10	657	92	44	10	80	40	12	32	1958
#1084 STATE COLLEGE BLVD/BASTANCHURY RD													
Base	660	1128	60	176	564	208	340	1140	340	48	1008	260	5932
Added	100	199	0	17	80	0	0	213	32	0	118	10	769
Total	760	1327	60	193	644	208	340	1353	372	48	1126	270	6701
#1085 STATE COLLEGE BLVD/YORBA LINDA BLVD													
Base	32	1192	792	292	588	96	76	192	36	684	152	316	4448
Added	1	299	56	0	112	0	0	0	0	43	0	0	511
Total	33	1491	848	292	700	96	76	192	36	727	152	316	4959
#1089 CHAPMAN AVE/RAYMOND AVE													
Base	272	268	216	124	192	84	88	1004	168	144	1232	124	3916
Added	43	2	108	0	2	2	3	397	23	135	524	0	1239
Total	315	270	324	124	194	86	91	1401	191	279	1756	124	5155
#1091 CHAPMAN AVE/ACACIA AVE													
Base	210	150	150	50	110	70	70	1250	110	120	1530	80	3900
Added	24	0	44	0	0	0	0	516	9	5	615	0	1213
Total	234	150	194	50	110	70	70	1766	119	125	2145	80	5113
#1092 COMMONWEALTH AVE/RAYMOND AVE													
Base	260	676	128	104	312	120	176	624	148	116	836	108	3608
Added	133	129	10	0	112	45	32	193	42	3	415	0	1114
Total	393	805	138	104	424	165	208	817	190	119	1251	108	4722
#1093 COMMONWEALTH AVE/ACACIA AVE													
Base	250	410	170	60	180	130	90	930	130	60	650	50	3110
Added	48	65	15	0	17	81	44	119	5	5	234	0	633
Total	298	475	185	60	197	211	134	1049	135	65	884	50	3743

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1014 MALVERN AVE/GILBERT ST													
Base	184	608	440	160	520	188	232	792	100	408	1032	188	4852
Added	27	156	35	86	101	0	0	137	8	8	232	106	896
Total	211	764	475	246	621	188	232	929	108	416	1264	294	5748
#1017 MAGNOLIA AVE/VALENCIA DR													
Base	212	796	148	92	784	60	24	308	148	108	268	88	3036
Added	12	49	12	0	94	0	0	58	12	25	69	1	332
Total	224	845	160	92	878	60	24	366	160	133	337	89	3368
#1018 COMMONWEALTH AVE/MAGNOLIA AVE													
Base	312	0	396	16	20	20	0	696	192	448	556	4	2660
Added	26	-1	20	3	-3	-1	-1	280	56	39	156	7	581
Total	338	-1	416	19	17	19	-1	976	248	487	712	11	3241
#1020 ORANGETHORPE AVE/MAGNOLIA AVE													
Base	276	908	360	120	876	80	128	468	300	212	632	144	4504
Added	0	60	39	18	115	4	3	121	0	58	248	17	683
Total	276	968	399	138	991	84	131	589	300	270	880	161	5187
#1021 COMMONWEALTH AVE/BROOKHURST RD													
Base	512	24	440	12	24	12	8	496	504	408	608	16	3064
Added	26	0	22	0	0	0	0	289	72	29	119	0	557
Total	538	24	462	12	24	12	8	785	576	437	727	16	3621
#1023 BROOKHURST RD/VALENCIA DR													
Base	144	804	108	96	700	84	104	264	104	140	284	96	2928
Added	4	49	23	1	112	3	2	85	19	55	82	3	438
Total	148	853	131	97	812	87	106	349	123	195	366	99	3366
#1024 ORANGETHORPE AVE/BROOKHURST RD													
Base	200	1004	232	116	812	88	184	668	176	260	708	140	4588
Added	28	68	28	6	207	7	3	181	5	44	265	4	846
Total	228	1072	260	122	1019	95	187	849	181	304	973	144	5434
#1026 STATE COLLEGE BLVD/NUTWOOD AVE													
Base	44	1680	256	276	1408	88	64	96	36	328	96	332	4704
Added	0	263	0	35	117	0	0	0	0	1	0	93	509
Total	44	1943	256	311	1525	88	64	96	36	329	96	425	5213
#1027 STATE COLLEGE BLVD/CHAPMAN AVE													
Base	228	1292	268	276	696	536	468	992	144	164	884	428	6376
Added	34	171	160	0	65	52	92	542	16	343	587	0	2062
Total	262	1463	428	276	761	588	560	1534	160	507	1471	428	8438



Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1307 IMPERIAL HWY/SR-57 NB OFF RAMP-BREA PLAZA													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	76	0	0	0	0	0	0	78	0	0	82	0	236
Total	76	0	0	0	0	0	0	78	0	0	82	0	236
#1309 YORBA LINDA BLVD/SR-57 SB OFF RAMP													
Base	0	0	0	872	0	212	0	964	532	0	1772	528	4880
Added	0	0	0	36	0	20	0	140	0	0	138	0	334
Total	0	0	0	908	0	232	0	1104	532	0	1910	528	5214
#1310 YORBA LINDA BLVD/SR-57 NB OFF RAMP													
Base	536	0	696	0	0	0	0	1452	156	0	1568	308	4716
Added	43	0	39	0	0	0	0	112	0	0	134	0	328
Total	579	0	735	0	0	0	0	1564	156	0	1702	308	5044
#1311 NUTWOOD AVE/SR-57 SB RAMPS													
Base	0	0	0	168	256	316	0	848	772	152	692	0	3204
Added	0	0	0	2	168	43	0	101	41	77	19	0	451
Total	0	0	0	170	424	359	0	949	813	229	711	0	3655
#1312 NUTWOOD AVE/SR-57 NB RAMPS													
Base	392	472	256	0	0	0	412	596	0	0	432	116	2676
Added	18	254	71	0	0	0	100	3	0	0	79	1	526
Total	410	726	327	0	0	0	512	599	0	0	511	117	3202
#1313 CHAPMAN AVE/SR-57 SB RAMPS													
Base	0	0	0	152	28	224	0	1108	488	440	1300	0	3740
Added	0	0	0	0	45	168	0	506	257	4	314	0	1294
Total	0	0	0	152	73	392	0	1614	745	444	1614	0	5034
#1314 CHAPMAN AVE/SR-57 NB RAMPS													
Base	444	88	356	0	0	0	212	936	0	0	1144	288	3468
Added	148	18	5	0	0	0	254	253	0	0	170	0	848
Total	592	106	361	0	0	0	466	1189	0	0	1314	288	4316
#1315 MAGNOLIA AVE/SR-91 WB RAMPS													
Base	236	1288	0	0	1172	328	0	0	0	484	0	180	3688
Added	0	75	0	0	116	56	0	0	0	0	0	24	271
Total	236	1363	0	0	1288	384	0	0	0	484	0	204	3959
#1317 BROOKHURST/SR-91 WB RAMPS													
Base	180	1276	0	0	1104	336	0	0	0	492	0	328	3716
Added	0	94	0	0	220	45	0	0	0	0	0	38	397
Total	180	1370	0	0	1324	381	0	0	0	492	0	366	4113

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 Future Build-Out  
 Default Trip Distribution  
 PM Trips  
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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
<b>#281</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	29	29	23	0	33	22	8	0	13	22	0	0	179
Total	29	29	23	0	33	22	8	0	13	22	0	0	179
<b>#283 EUCLID ST/HILL AVE-SOUTHGATE AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	7	200	1	0	246	4	6	0	14	0	0	1	479
Total	7	200	1	0	246	4	6	0	14	0	0	1	479
<b>#285 CHAPMAN AVE/MALDEN AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	57	0	41	3	0	0	0	210	59	44	285	0	699
Total	57	0	41	3	0	0	0	210	59	44	285	0	699
<b>#286 COMMONWEALTH AVE/MALDEN AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	3	19	0	45	22	187	0	4	444	8	732
Total	0	0	3	19	0	45	22	187	0	4	444	8	732
<b>#295 CHAPMAN AVE/POMONA AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	3	3	0	3	0	0	325	0	2	401	0	737
Total	0	3	3	0	3	0	0	325	0	2	401	0	737
<b>#296 COMMONWEALTH AVE/POMONA AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	78	5	115	0	4	0	0	229	59	66	420	0	976
Total	78	5	115	0	4	0	0	229	59	66	420	0	976
<b>#297 LEMON ST/WILSHIRE AVE</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	124	0	10	226	1	1	0	0	0	0	8	370
Total	0	124	0	10	226	1	1	0	0	0	0	8	370
<b>#298 VALENCIA DR/POMONA AVE</b>													
Base	48	16	140	28	8	24	16	212	16	36	284	16	844
Added	7	0	44	76	0	125	83	15	9	126	41	59	585
Total	55	16	184	104	8	149	99	227	25	162	325	75	1429
<b>#320 STATE COLLEGE BLVD/WALNUT AVE</b>													
Base	148	1068	72	148	888	48	44	0	92	44	0	316	2868
Added	8	374	0	0	462	6	39	0	56	0	0	0	945
Total	156	1442	72	148	1350	54	83	0	148	44	0	316	3813



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 Future Build-Out  
 Default Trip Distribution  
 PM Trips  
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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#99 HARBOR BLVD/LAS PALMAS DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	412	0	0	456	0	0	0	0	0	0	0	868
Total	0	412	0	0	456	0	0	0	0	0	0	0	868
#100 HARBOR BLVD/HERMOSA DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	412	0	0	456	0	0	0	3	0	0	0	871
Total	0	412	0	0	456	0	0	0	3	0	0	0	871
#101 HARBOR BLVD/VALENCIA MESA DR													
Base	144	1312	124	144	968	168	208	72	312	240	152	320	4164
Added	2	353	11	42	579	0	0	5	-6	56	14	84	1140
Total	146	1665	135	186	1547	168	208	77	306	296	166	404	5304
#102 HARBOR BLVD/EAST VALLEY VIEW DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	393	0	0	665	0	0	0	0	0	0	0	1058
Total	0	393	0	0	665	0	0	0	0	0	0	0	1058
#104 HARBOR BLVD/UNION AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	337	0	0	602	0	3	0	0	0	0	0	942
Total	0	337	0	0	602	0	3	0	0	0	0	0	942
#105 HARBOR BLVD/WILSHIRE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	142	335	0	0	600	54	51	1	176	0	1	0	1360
Total	142	335	0	0	600	54	51	1	176	0	1	0	1360
#106 HARBOR BLVD/AMERIGE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	4	430	0	0	725	51	47	8	5	0	10	0	1280
Total	4	430	0	0	725	51	47	8	5	0	10	0	1280
#107 HARBOR BLVD/VALENCIA DR													
Base	92	1364	72	32	1436	56	76	112	116	72	152	44	3624
Added	32	345	12	166	473	53	50	51	91	86	78	99	1536
Total	124	1709	84	198	1909	109	126	163	207	158	230	143	5160
#108 HARBOR BLVD/SOUTHGATE AVE/COSTCO													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	53	427	0	0	461	0	0	0	27	0	0	0	968
Total	53	427	0	0	461	0	0	0	27	0	0	0	968

None

Tue Jan 17, 2017 14:47:57

Page 2-5

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#109 HARBOR BLVD/ORANGEFAIR AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	570	44	16	542	0	0	0	0	24	0	26	1222
Total	0	570	44	16	542	0	0	0	0	24	0	26	1222
#111 IMPERIAL HWY/MERVYN'S DR													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	303	0	0	202	0	505
Total	0	0	0	0	0	0	0	303	0	0	202	0	505
#112 BASTANCHURY RD/BALBOA RD/ST JUDE AVE													
Base	44	16	172	16	0	20	16	1672	52	100	1500	20	3628
Added	0	0	33	0	0	28	0	187	4	0	133	1	386
Total	44	16	205	16	0	48	16	1859	56	100	1633	21	4014
#113 LAMBERT RD/PALM ST													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	72	71	143	0	49	9	21	91	30	62	39	0	587
Total	72	71	143	0	49	9	21	91	30	62	39	0	587
#115 BASTANCHURY RD/PUENTE ST													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	1	0	219	0	0	133	0	353
Total	0	0	0	0	0	1	0	219	0	0	133	0	353
#116 BREA BLVD/LEMON ST													
Base	92	20	336	28	24	24	28	1116	84	260	640	12	2664
Added	2	0	13	0	0	0	0	39	5	9	13	0	81
Total	94	20	349	28	24	24	28	1155	89	269	653	12	2745
#118 LEMON ST/VALENCIA DR													
Base	92	1264	68	96	1076	104	96	64	116	92	56	76	3200
Added	92	136	15	0	257	133	48	2	85	1	1	1	771
Total	184	1400	83	96	1333	237	144	66	201	93	57	77	3971
#119 LEMON ST/ORANGEFAIR AVE													
Base	148	1524	92	164	1208	132	172	96	120	188	80	128	4052
Added	26	202	0	0	213	3	4	0	8	0	0	0	456
Total	174	1726	92	164	1421	135	176	96	128	188	80	128	4508
#126 COMMONWEALTH AVE/BERKELEY AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	2	0	20	18	262	0	0	619	3	924
Total	0	0	0	2	0	20	18	262	0	0	619	3	924

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Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1028 STATE COLLEGE BLVD/COMMONWEALTH AVE													
Base	348	908	112	56	916	180	228	368	156	112	488	100	3972
Added	90	305	29	0	381	35	46	62	39	43	114	0	1144
Total	438	1213	141	56	1297	215	274	430	195	155	602	100	5116
#1030 BREA BLVD/ROLLING HILLS DR													
Base	40	540	40	70	600	380	40	60	60	90	60	50	2030
Added	0	188	0	0	92	0	0	0	0	0	0	0	280
Total	40	728	40	70	692	380	40	60	60	90	60	50	2310
#1031 BASTANCHURY RD/BREA BLVD													
Base	116	1156	432	268	788	304	544	1496	140	424	1284	432	7384
Added	0	53	-1	48	26	18	21	198	0	-5	115	114	587
Total	116	1209	431	316	814	322	565	1694	140	419	1399	546	7971
#20 #1035 HARBOR BLVD/ORANGETHORPE AVE													
Base	308	1384	284	228	1164	248	316	680	228	356	972	288	6456
Added	53	531	37	27	455	7	40	126	29	61	247	87	1700
Total	361	1915	321	255	1619	255	356	806	257	417	1219	375	8156
#21 #1037 ORANGETHORPE AVE/LEMON ST													
Base	256	1092	168	176	940	156	204	736	188	284	1020	200	5420
Added	65	164	15	19	287	32	33	128	88	204	257	46	1338
Total	321	1256	183	195	1227	188	237	864	276	488	1277	246	6758
#1042 EUCLID ST/ORANGETHORPE AVE													
Base	220	1188	252	200	1060	164	148	752	148	256	948	220	5556
Added	43	153	17	27	210	23	21	192	40	19	265	35	1045
Total	263	1341	269	227	1270	187	169	944	188	275	1213	255	6601
#1044 EUCLID ST/VALENCIA DR													
Base	104	1084	100	148	1012	224	204	216	100	164	260	164	3780
Added	5	191	11	11	229	18	25	92	11	11	62	8	674
Total	109	1275	111	159	1241	242	229	308	111	175	322	172	4454
#1045 COMMONWEALTH AVE/GILBERT ST													
Base	40	268	72	516	264	756	528	416	56	160	556	572	4204
Added	6	43	3	92	45	67	75	225	4	6	129	42	737
Total	46	311	75	608	309	823	603	641	60	166	685	614	4941
#1049 EUCLID ST/COMMONWEALTH AVE													
Base	108	1404	264	88	1000	172	232	552	84	252	664	168	4988
Added	53	110	58	26	105	14	32	295	73	80	80	20	946
Total	161	1514	322	114	1105	186	264	847	157	332	744	188	5934

Future Build-Out  
Default Trip Distribution  
PM Trips

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1318 BROOKHURST/SR-91 EB RAMPS													
Base	0	984	528	296	1256	0	516	0	236	0	0	0	3816
Added	0	72	0	127	93	0	22	0	0	0	0	0	314
Total	0	1056	528	423	1349	0	538	0	236	0	0	0	4130
#1319 EUCLID ST/SR-91 WB RAMPS													
Base	300	1536	0	0	1164	328	0	0	0	568	0	404	4300
Added	0	162	0	0	251	23	0	0	0	0	0	56	492
Total	300	1698	0	0	1415	351	0	0	0	568	0	460	4792
#1320 EUCLID ST/SR-91 EB RAMPS													
Base	0	1416	856	288	1496	0	416	0	368	0	0	0	4840
Added	0	152	0	105	146	0	10	0	0	0	0	0	413
Total	0	1568	856	393	1642	0	426	0	368	0	0	0	5253
#22 #1321 HARBOR BLVD/SR-91 WB RAMPS													
Base	236	1416	0	0	1108	516	0	0	0	240	288	212	4016
Added	0	457	0	0	298	267	0	0	0	0	42	156	1220
Total	236	1873	0	0	1406	783	0	0	0	240	330	368	5236
#24 #1322 HARBOR BLVD/SR-91 EB RAMPS													
Base	0	1484	424	328	1136	0	488	212	208	0	0	0	4280
Added	0	226	0	155	143	0	232	35	0	0	0	0	791
Total	0	1710	424	483	1279	0	720	247	208	0	0	0	5071
#23 #1323 LEMON ST/ANAHEIM BLVD/SR-91 WB RAMPS													
Base	172	1296	0	0	1284	256	0	0	0	168	404	500	4080
Added	0	171	0	0	179	42	0	0	0	0	156	160	708
Total	172	1467	0	0	1463	298	0	0	0	168	560	660	4788
#25 #1324 LEMON ST/ANAHEIM BLVD/SR-91 EB RAMPS													
Base	0	1052	344	596	744	0	340	576	80	0	0	0	3732
Added	0	136	0	134	45	0	35	155	0	0	0	0	505
Total	0	1188	344	730	789	0	375	731	80	0	0	0	4237
#1325 RAYMOND AVE/SR-91 WB RAMPS													
Base	440	800	0	0	940	504	0	0	0	180	0	284	3148
Added	0	133	0	0	312	131	0	0	0	4	0	33	613
Total	440	933	0	0	1252	635	0	0	0	184	0	317	3761
#1326 RAYMOND AVE/SR-91 EB RAMPS													
Base	0	876	336	444	580	0	380	0	436	0	0	0	3052
Added	0	92	4	98	219	0	41	0	0	0	0	0	454
Total	0	968	340	542	799	0	421	0	436	0	0	0	3506

None

Tue Jan 17, 2017 14:47:57

Page 2-10

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 Future Build-Out  
 Default Trip Distribution  
 PM Trips  
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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#242 HARBOR BLVD/SANTA FE AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	465	75	43	735	0	0	0	0	0	0	71	1389
Total	0	465	75	43	735	0	0	0	0	0	0	71	1389
#243 HARBOR BLVD/ORANGEFAIR MALL													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	16	580	0	20	524	0	11	0	33	0	0	31	1215
Total	16	580	0	20	524	0	11	0	33	0	0	31	1215
#244 ORANGETHORPE AVE/POMONA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	101	0	109	0	0	0	0	140	51	61	293	0	755
Total	101	0	109	0	0	0	0	140	51	61	293	0	755
#247 LEMON ST/NUTWOOD PL													
Base	32	836	140	96	576	16	32	4	64	144	8	148	2096
Added	0	43	0	0	52	0	0	0	0	0	0	0	95
Total	32	879	140	96	628	16	32	4	64	144	8	148	2191
#248 BERKELEY AVE/EAST-OF-LEMON ST DWY													
Base	0	0	72	0	0	0	0	472	64	0	612	0	1220
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	72	0	0	0	0	472	64	0	612	0	1220
#250 BERKELEY AVE/NORTH-OF-BROOKDALE PL DWY													
Base	68	0	0	0	0	20	56	0	172	0	0	0	316
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	0	0	0	0	20	56	0	172	0	0	0	316
#257 COMMONWEALTH AVE/PRITCHARD AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	2	0	2	0	0	0	0	302	1	1	200	0	508
Total	2	0	2	0	0	0	0	302	1	1	200	0	508
#272													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	2	0	1	0	0	0	0	64	3	0	71	0	141
Total	2	0	1	0	0	0	0	64	3	0	71	0	141
#273													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	9	160	0	0	146	0	0	0	4	0	0	0	319
Total	9	160	0	0	146	0	0	0	4	0	0	0	319



None

Tue Jan 17, 2017 14:47:57

Page 2-12

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 Future Build-Out  
 Default Trip Distribution  
 PM Trips  
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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#328 YORBA LINDA BLVD/ALMIRA AVE													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	14	0	0	0	0	56	0	15	43	0	128
Total	0	0	14	0	0	0	0	56	0	15	43	0	128
#331 COMMONWEALTH AVE/COLLEGE PL													
Base	0	550	0	0	400	0	0	0	0	0	0	0	950
Added	2	225	0	0	747	0	0	0	4	0	0	0	978
Total	2	775	0	0	1147	0	0	0	4	0	0	0	1928
#345													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	56	0	467	0	0	774	0	1297
Total	0	0	0	0	0	56	0	467	0	0	774	0	1297
#349													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	35	0	0	0	0	467	0	0	774	24	1300
Total	0	0	35	0	0	0	0	467	0	0	774	24	1300
#360													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	738	0	0	419	12	0	0	0	0	0	9	1178
Total	0	738	0	0	419	12	0	0	0	0	0	9	1178
#364 LEMON AVE/GROVE PL													
Base	84	916	80	72	680	36	4	0	4	88	0	80	2044
Added	0	43	0	0	52	0	0	0	0	0	0	0	95
Total	84	959	80	72	732	36	4	0	4	88	0	80	2139
#366 IMPERIAL HWY/STATE COLLEGE BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	-1	210	0	0	97	0	0	283	0	0	162	0	751
Total	-1	210	0	0	97	0	0	283	0	0	162	0	751
#367 IMPERIAL HWY/BREA BLVD													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	2	178	8	4	82	6	5	271	4	5	153	3	721
Total	2	178	8	4	82	6	5	271	4	5	153	3	721
#369 STATE COLLEGE BLVD/SR-91 EB RAMPS													
Base	0	1100	240	404	912	0	312	0	308	0	0	0	3276
Added	0	82	13	264	215	0	53	0	0	0	0	0	627
Total	0	1182	253	668	1127	0	365	0	308	0	0	0	3903

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## APPENDIX E

### EXISTING PLUS PROJECT TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

*APPENDIX E-1*

**EXISTING PLUS PROJECT WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	57.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	296	1280	212	333	980	391	281	1255	171	191	1119	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	296	1280	212	333	980	391	281	1255	171	191	1119	330
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	320	53	83	245	98	70	314	43	48	280	83
Total Analysis Volume [veh/h]	296	1280	212	333	980	391	281	1255	171	191	1119	330
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	42	0	11	38	0	15	45	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	46	46	7	42	42	11	33	33	8	30	30
g / C, Green / Cycle	0.10	0.42	0.42	0.06	0.38	0.38	0.10	0.30	0.30	0.07	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.12	0.10	0.25	0.24	0.16	0.25	0.26	0.05	0.20	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	354	2376	750	228	1447	686	182	1139	539	256	1548	489
d1, Uniform Delay [s]	48.63	24.16	21.24	51.51	28.09	27.71	49.53	36.09	36.63	50.07	36.37	35.80
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.14	0.11	0.25	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.23	0.88	0.94	212.44	2.29	4.26	251.92	1.73	9.76	4.30	0.65	1.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.54	0.28	1.46	0.65	0.62	1.54	0.84	0.87	0.75	0.72	0.67
d, Delay for Lane Group [s/veh]	53.86	25.04	22.18	263.96	30.38	31.97	301.45	37.81	46.39	54.37	37.03	37.53
Lane Group LOS	D	C	C	F	C	C	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.24	8.40	3.78	9.87	10.50	9.81	17.73	12.08	13.31	2.73	9.09	8.07
50th-Percentile Queue Length [ft/ln]	105.95	209.97	94.49	246.65	262.61	245.24	443.27	301.95	332.81	68.18	227.35	201.81
95th-Percentile Queue Length [veh/ln]	7.61	13.15	6.80	16.64	15.82	14.95	28.36	17.78	19.30	4.91	14.04	12.73
95th-Percentile Queue Length [ft/ln]	190.36	328.79	170.09	416.00	395.49	373.66	708.90	444.44	482.40	122.73	350.99	318.30

**Movement, Approach, & Intersection Results**

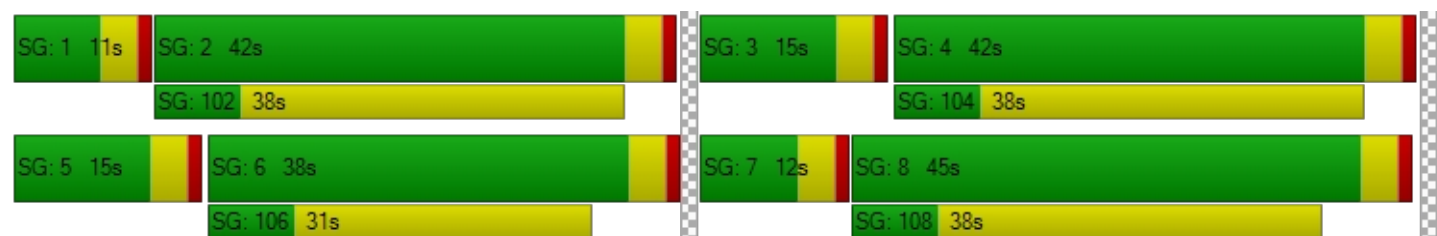
d_M, Delay for Movement [s/veh]	53.86	25.04	22.18	263.96	30.44	31.97	301.45	39.87	46.39	54.37	37.03	37.53
Movement LOS	D	C	C	F	C	C	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	29.47			76.43			83.58			39.15		
Approach LOS	C			E			F			D		
d_I, Intersection Delay [s/veh]	57.00											
Intersection LOS	E											
Intersection V/C	0.802											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.198			3.173			3.093			3.231		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			745			691		
d_b, Bicycle Delay [s]	23.56			26.25			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.543			2.497			2.498			2.462		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	27	1414	609	97	1242	68	102	191	36	553	114	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1414	609	97	1242	68	102	191	36	553	114	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	354	152	24	311	17	26	48	9	138	29	0
Total Analysis Volume [veh/h]	27	1414	609	97	1242	68	102	191	36	553	114	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	11	33	0	0	16	0	0	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	50	7	54	54	14	14	14	24	24
g / C, Green / Cycle	0.03	0.45	0.06	0.49	0.49	0.12	0.12	0.12	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.05	0.28	0.14	0.06	0.10	0.02	0.18	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	57	2582	116	1846	874	222	234	222	385	385
d1, Uniform Delay [s]	52.40	21.91	50.93	20.18	16.92	44.85	47.04	43.17	41.69	41.82
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.98	0.84	14.39	1.30	0.83	1.48	6.76	0.34	5.69	6.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.55	0.84	0.57	0.29	0.46	0.81	0.16	0.86	0.87
d, Delay for Lane Group [s/veh]	58.38	22.75	65.33	21.49	17.75	46.33	53.79	43.51	47.37	48.04
Lane Group LOS	E	C	E	C	B	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.83	8.86	3.10	9.73	3.94	2.68	5.52	0.90	9.19	9.40
50th-Percentile Queue Length [ft/ln]	20.69	221.43	77.53	243.24	98.57	66.95	138.01	22.49	229.82	235.00
95th-Percentile Queue Length [veh/ln]	1.49	13.74	5.58	14.85	7.10	4.82	9.37	1.62	14.17	14.43
95th-Percentile Queue Length [ft/ln]	37.24	343.45	139.55	371.13	177.43	120.52	234.34	40.49	354.13	360.70

**Movement, Approach, & Intersection Results**

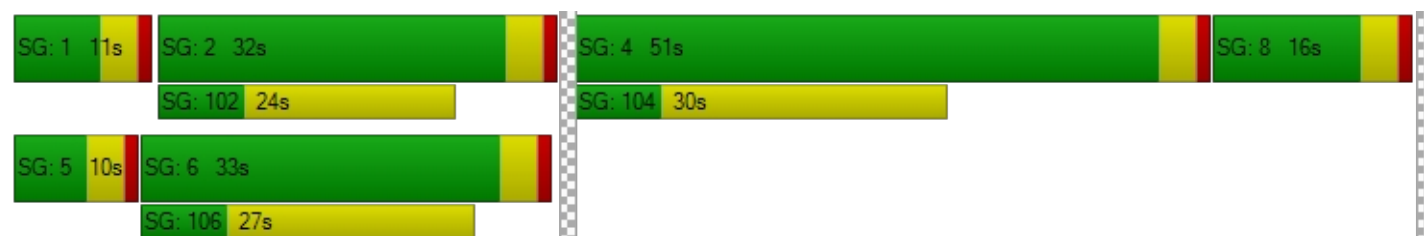
d_M, Delay for Movement [s/veh]	58.38	22.75	0.00	65.33	20.93	17.75	46.33	53.79	43.51	47.64	48.04	0.00
Movement LOS	E	C		E	C	B	D	D	D	D	D	
d_A, Approach Delay [s/veh]	23.41			23.84			50.35			47.71		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.09											
Intersection LOS	C											
Intersection V/C	0.689											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			3.011			2.272			2.260		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			527			218			855		
d_b, Bicycle Delay [s]	30.56			29.82			43.65			18.04		
I_b,int, Bicycle LOS Score for Intersection	2.352			2.333			2.102			2.660		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	81	1377	30	432	1314	37	40	192	127	61	261	607
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	1377	30	432	1314	37	40	192	127	61	261	607
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	344	8	108	329	9	10	48	32	15	65	152
Total Analysis Volume [veh/h]	81	1377	30	432	1314	37	40	192	127	61	261	607
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	50	50	16	60	60	32	32	32	32	32	52
g / C, Green / Cycle	0.06	0.45	0.45	0.15	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.47
(v / s)_i Volume / Saturation Flow Rate	0.05	0.38	0.38	0.12	0.35	0.02	0.02	0.10	0.07	0.03	0.14	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	863	818	513	2070	980	347	551	522	407	551	851
d1, Uniform Delay [s]	51.27	26.46	26.37	45.68	17.42	11.64	28.34	30.82	29.81	28.68	32.12	23.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.42	9.62	9.82	3.84	1.50	0.07	0.15	0.38	0.24	0.17	0.63	5.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.80	0.84	0.83	0.84	0.63	0.04	0.12	0.35	0.24	0.15	0.47	0.71
d, Delay for Lane Group [s/veh]	64.69	36.07	36.19	49.52	18.92	11.71	28.48	31.20	30.05	28.85	32.75	28.09
Lane Group LOS	E	D	D	D	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.58	18.45	17.39	5.99	11.50	0.44	0.78	4.07	2.60	1.21	5.78	13.30
50th-Percentile Queue Length [ft/ln]	64.50	461.25	434.70	149.78	287.43	10.90	19.56	101.74	65.03	30.13	144.51	332.42
95th-Percentile Queue Length [veh/ln]	4.64	25.49	24.23	10.01	17.06	0.78	1.41	7.33	4.68	2.17	9.72	19.28
95th-Percentile Queue Length [ft/ln]	116.10	637.36	605.67	250.14	426.45	19.61	35.21	183.13	117.06	54.23	243.08	481.92

**Movement, Approach, & Intersection Results**

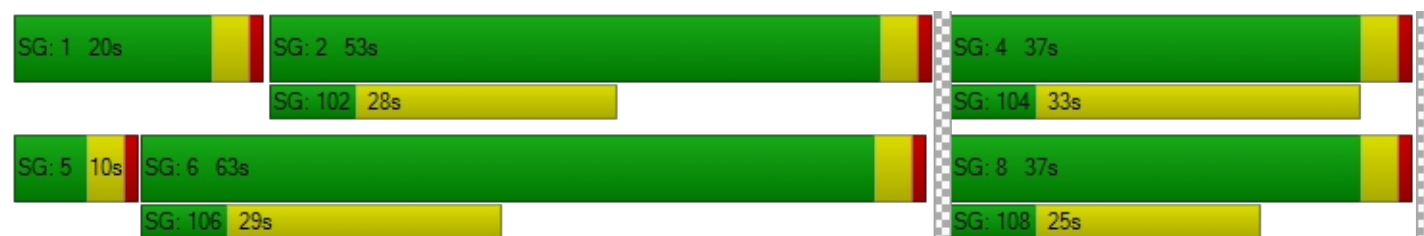
d_M, Delay for Movement [s/veh]	64.69	36.13	36.19	49.52	18.92	11.71	28.48	31.20	30.05	28.85	32.75	28.09
Movement LOS	E	D	D	D	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	37.68			26.19			30.49			29.45		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	30.94											
Intersection LOS	C											
Intersection V/C	0.883											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.979			3.191			2.321			2.618		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.787			3.031			2.152			3.092		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	446	426	128	115	296	19	23	351	289	81	490	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	446	426	128	115	296	19	23	351	289	81	490	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	107	32	29	74	5	6	88	72	20	123	36
Total Analysis Volume [veh/h]	446	426	128	115	296	19	23	351	289	81	490	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	43	0	0	33	0	0	34	34	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	37	23	23	64	23	23	23
g / C, Green / Cycle	0.34	0.34	0.34	0.34	0.34	0.21	0.21	0.59	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.24	0.24	0.07	0.06	0.18	0.01	0.18	0.16	0.05	0.18	0.16
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	614	614	614	614	614	112	396	1055	96	396	375
d1, Uniform Delay [s]	31.44	31.44	25.65	25.45	28.88	34.83	42.18	11.20	36.00	41.83	41.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.21	0.50	0.11	0.19	0.16
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.82	6.82	0.77	0.67	3.05	0.89	12.18	0.64	17.09	9.12	5.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.71	0.71	0.21	0.19	0.51	0.21	0.89	0.27	0.84	0.85	0.79
d, Delay for Lane Group [s/veh]	38.26	38.26	26.42	26.12	31.92	35.72	54.36	11.85	53.09	50.95	46.63
Lane Group LOS	D	D	C	C	C	D	D	B	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	11.07	11.07	2.50	2.23	7.10	0.52	10.50	3.55	2.26	9.76	8.13
50th-Percentile Queue Length [ft/ln]	276.84	276.84	62.62	55.77	177.39	13.09	262.50	88.64	56.56	243.99	203.18
95th-Percentile Queue Length [veh/ln]	16.53	16.53	4.51	4.02	11.46	0.94	15.81	6.38	4.07	14.88	12.80
95th-Percentile Queue Length [ft/ln]	413.28	413.28	112.72	100.39	286.61	23.56	395.35	159.54	101.81	372.07	320.06

**Movement, Approach, & Intersection Results**

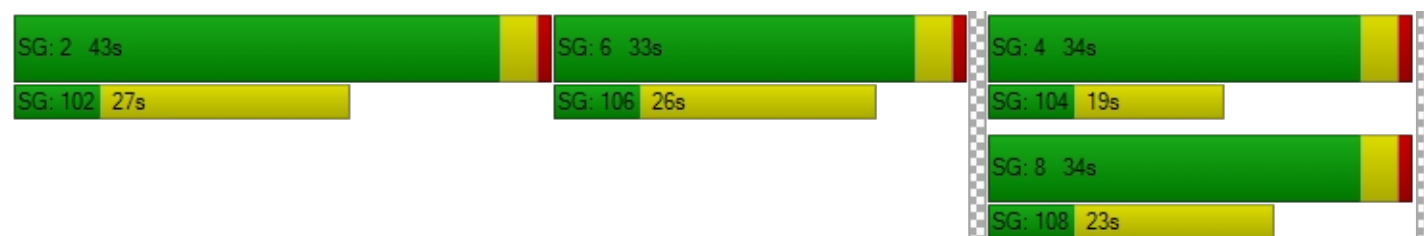
d_M, Delay for Movement [s/veh]	38.26	38.26	26.42	26.12	31.92	31.92	35.72	54.36	11.85	53.09	49.61	46.63
Movement LOS	D	D	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	36.74			30.37			35.18			49.40		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	38.63											
Intersection LOS	D											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.662			2.315			2.625			2.460		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			527			545			545		
d_b, Bicycle Delay [s]	22.91			29.82			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	3.210			2.269			2.654			2.150		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.401

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	28	233	177	402	461	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	233	177	402	461	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	58	44	101	115	6
Total Analysis Volume [veh/h]	28	233	177	402	461	23
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	46	46	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	85	85	85	85
g / C, Green / Cycle	0.15	0.15	0.78	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.10	0.21	0.24	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	269	269	1284	1477	1477	1399
d1, Uniform Delay [s]	40.27	45.54	3.01	3.45	3.59	2.75
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	8.14	0.22	0.46	0.55	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.86	0.14	0.27	0.31	0.02
d, Delay for Lane Group [s/veh]	40.44	53.68	3.24	3.90	4.14	2.77
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.67	6.78	0.85	2.19	2.61	0.10
50th-Percentile Queue Length [ft/ln]	16.70	169.41	21.24	54.65	65.33	2.49
95th-Percentile Queue Length [veh/ln]	1.20	11.05	1.53	3.93	4.70	0.18
95th-Percentile Queue Length [ft/ln]	30.06	276.14	38.23	98.37	117.59	4.49

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	40.44	53.68	3.24	3.90	4.14	2.77
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	52.26		3.70		4.08	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.41					
Intersection LOS	B					
Intersection V/C	0.401					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.351	2.363	2.247
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.088	4.931
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 64s

SG: 101 26s

SG: 4 46s





SG: 104 21s

SG: 8 46s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.842

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	189	1235	104	142	1113	29	52	601	175	158	806	235
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	1235	104	142	1113	29	52	601	175	158	806	235
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	309	26	36	278	7	13	150	44	40	202	59
Total Analysis Volume [veh/h]	189	1235	104	142	1113	29	52	601	175	158	806	235
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	47	47	45	35	35	45	36	36
g / C, Green / Cycle	0.52	0.43	0.43	0.52	0.43	0.43	0.41	0.31	0.31	0.41	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.37	0.36	0.08	0.31	0.31	0.03	0.22	0.20	0.09	0.29	0.27
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	561	815	772	430	815	772	329	599	567	485	620	587
d1, Uniform Delay [s]	14.14	28.29	27.99	13.74	26.02	25.93	19.95	33.01	32.32	21.23	35.31	34.25
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.14	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.62	10.90	10.39	0.44	5.51	5.65	0.22	1.44	1.20	0.39	6.27	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.85	0.84	0.33	0.72	0.72	0.16	0.69	0.64	0.33	0.90	0.83
d, Delay for Lane Group [s/veh]	15.76	39.20	38.38	14.18	31.53	31.57	20.17	34.45	33.52	21.62	41.58	37.42
Lane Group LOS	B	D	D	B	C	C	C	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.73	18.37	16.85	1.87	13.66	12.83	0.84	9.80	8.37	2.70	14.96	12.32
50th-Percentile Queue Length [ft/ln]	68.37	459.22	421.27	46.63	341.42	320.69	20.95	244.99	209.33	67.42	374.11	308.11
95th-Percentile Queue Length [veh/ln]	4.92	25.40	23.58	3.36	19.72	18.70	1.51	14.93	13.12	4.85	21.31	18.08
95th-Percentile Queue Length [ft/ln]	123.06	634.94	589.57	83.93	492.93	467.53	37.71	373.33	327.97	121.36	532.72	452.05

**Movement, Approach, & Intersection Results**

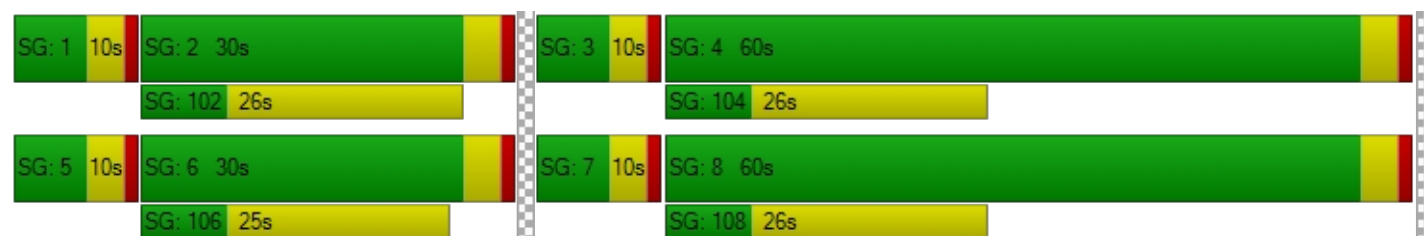
d_M, Delay for Movement [s/veh]	15.76	38.84	38.38	14.18	31.55	31.57	20.17	34.16	33.52	21.62	40.28	37.42
Movement LOS	B	D	D	B	C	C	C	C	C	C	D	D
d_A, Approach Delay [s/veh]	35.95			29.63			33.15			37.26		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	34.12											
Intersection LOS	C											
Intersection V/C	0.842											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.964			2.882			2.791			2.799		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.820			2.619			2.243			2.549		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.843

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	111	1066	123	121	904	106	244	707	102	198	1012	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1066	123	121	904	106	244	707	102	198	1012	154
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	267	31	30	226	27	61	177	26	50	253	39
Total Analysis Volume [veh/h]	111	1066	123	121	904	106	244	707	102	198	1012	154
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	10	56	0	13	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	58	48	48	58	48	48	44	31	31	44	34	34
g / C, Green / Cycle	0.53	0.44	0.44	0.53	0.44	0.44	0.40	0.28	0.28	0.40	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.33	0.32	0.07	0.28	0.27	0.14	0.22	0.21	0.11	0.27	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	642	829	785	539	830	786	368	536	508	449	1174	556
d1, Uniform Delay [s]	13.15	25.98	25.57	13.23	24.19	23.85	22.87	36.55	36.09	22.21	35.82	28.74
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	6.13	5.75	0.21	3.71	3.56	2.05	2.70	2.34	0.68	2.00	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.75	0.72	0.22	0.64	0.61	0.66	0.79	0.76	0.44	0.86	0.28
d, Delay for Lane Group [s/veh]	13.73	32.11	31.32	13.43	27.90	27.41	24.92	39.25	38.43	22.90	37.82	29.01
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.47	14.60	13.15	1.53	11.32	10.19	4.57	10.83	9.65	3.52	12.91	3.11
50th-Percentile Queue Length [ft/ln]	36.82	365.12	328.85	38.30	282.88	254.83	114.29	270.81	241.34	88.08	322.73	77.85
95th-Percentile Queue Length [veh/ln]	2.65	20.87	19.10	2.76	16.83	15.43	8.08	16.23	14.75	6.34	18.80	5.61
95th-Percentile Queue Length [ft/ln]	66.28	521.80	477.54	68.94	420.79	385.72	201.95	405.75	368.73	158.54	470.04	140.13

**Movement, Approach, & Intersection Results**

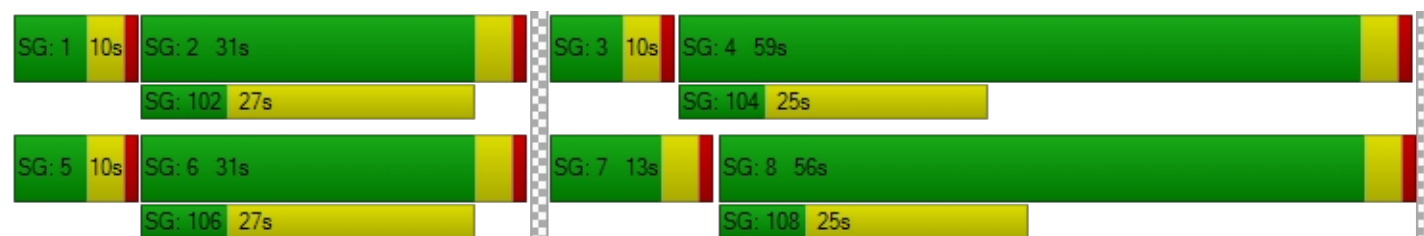
d_M, Delay for Movement [s/veh]	13.73	31.78	31.32	13.43	27.70	27.41	24.92	38.92	38.43	22.90	37.82	29.01
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	30.20			26.14			35.63			34.66		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	31.69											
Intersection LOS	C											
Intersection V/C	0.843											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.882			2.929			2.826			2.917		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			945			1000		
d_b, Bicycle Delay [s]	31.31			31.31			15.29			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.632			2.493			2.428			2.685		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):34.5  
C  
0.742**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	151	846	140	82	603	116	147	786	125	283	1140	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	846	140	82	603	116	147	786	125	283	1140	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	212	35	21	151	29	37	197	31	71	285	30
Total Analysis Volume [veh/h]	151	846	140	82	603	116	147	786	125	283	1140	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	34	0	10	29	0	15	51	0	15	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	41	41	50	39	39	11	37	37	11	37	37
g / C, Green / Cycle	0.46	0.37	0.37	0.46	0.35	0.35	0.10	0.34	0.34	0.10	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.08	0.05	0.20	0.19	0.08	0.25	0.24	0.08	0.30	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	619	1397	662	585	664	629	177	641	608	345	1284	608
d1, Uniform Delay [s]	17.85	28.31	23.86	17.13	29.11	28.72	48.76	32.31	31.79	48.68	34.48	25.86
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.16	0.14	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.93	1.95	0.73	0.11	3.55	3.31	9.69	2.59	1.98	4.89	2.30	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.24	0.61	0.21	0.14	0.57	0.54	0.83	0.75	0.71	0.82	0.89	0.20
d, Delay for Lane Group [s/veh]	18.78	30.27	24.59	17.24	32.66	32.02	58.45	34.89	33.77	53.57	36.78	26.02
Lane Group LOS	B	C	C	B	C	C	E	C	C	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.43	9.31	2.63	1.20	8.70	7.68	4.43	11.59	10.21	4.03	14.55	2.26
50th-Percentile Queue Length [ft/ln]	60.73	232.84	65.66	30.00	217.57	192.09	110.71	289.70	255.18	100.86	363.64	56.46
95th-Percentile Queue Length [veh/ln]	4.37	14.32	4.73	2.16	13.54	12.23	7.88	17.17	15.45	7.26	20.80	4.07
95th-Percentile Queue Length [ft/ln]	109.32	357.97	118.19	54.00	338.52	305.74	196.99	429.26	386.17	181.54	520.01	101.64

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	18.78	30.27	24.59	17.24	32.42	32.02	58.45	34.46	33.77	53.57	36.78	26.02
Movement LOS	B	C	C	B	C	C	E	C	C	D	D	C
d_A, Approach Delay [s/veh]	28.04			30.81			37.71			39.02		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.52											
Intersection LOS	C											
Intersection V/C	0.742											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.811			2.683			2.869			3.004		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			455			855			855		
d_b, Bicycle Delay [s]	29.09			32.84			18.04			18.04		
I_b,int, Bicycle LOS Score for Intersection	2.498			2.220			2.432			2.833		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	11	62	43	438	61	87	67	902	13	52	1425	456
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	62	43	438	61	87	67	902	13	52	1425	456
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	11	110	15	22	17	226	3	13	356	114
Total Analysis Volume [veh/h]	11	62	43	438	61	87	67	902	13	52	1425	456
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	18	28	74	74	74	65	65	87
g / C, Green / Cycle	0.05	0.05	0.05	0.16	0.25	0.67	0.67	0.67	0.59	0.59	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.02	0.13	0.08	0.04	0.25	0.25	0.03	0.38	0.25
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	101	96	573	456	854	1281	1213	891	2241	1421
d1, Uniform Delay [s]	49.61	50.97	50.51	44.00	33.42	6.08	7.78	7.76	9.54	14.83	3.26
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	5.83	3.23	2.17	0.41	0.04	0.82	0.85	0.13	1.39	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.61	0.45	0.76	0.32	0.08	0.37	0.37	0.06	0.64	0.32
d, Delay for Lane Group [s/veh]	50.78	56.80	53.75	46.16	33.83	6.11	8.59	8.62	9.67	16.22	3.39
Lane Group LOS	D	E	D	D	C	A	A	A	A	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.31	1.83	1.23	5.85	3.27	0.50	4.72	4.45	0.55	11.42	2.21
50th-Percentile Queue Length [ft/ln]	7.75	45.85	30.85	146.26	81.71	12.53	117.96	111.36	13.68	285.58	55.23
95th-Percentile Queue Length [veh/ln]	0.56	3.30	2.22	9.82	5.88	0.90	8.28	7.92	0.98	16.97	3.98
95th-Percentile Queue Length [ft/ln]	13.94	82.53	55.53	245.43	147.08	22.56	207.02	197.89	24.62	424.15	99.41

**Movement, Approach, & Intersection Results**

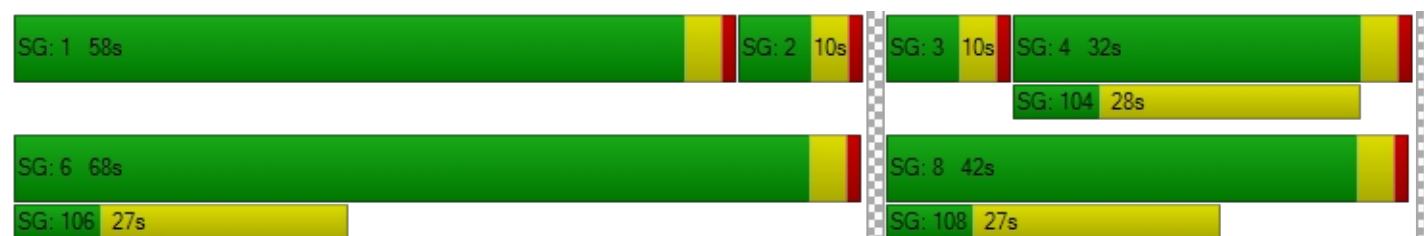
d_M, Delay for Movement [s/veh]	50.78	56.80	53.75	46.16	33.83	33.83	6.11	8.61	8.62	9.67	16.22	3.39
Movement LOS	D	E	D	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	55.10			43.05			8.44			13.02		
Approach LOS	E			D			A			B		
d_I, Intersection Delay [s/veh]	17.99											
Intersection LOS	B											
Intersection V/C	0.614											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.274			2.484			2.814			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.751			2.527			2.370			3.154		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	284	268	232	65	162	62	59	1081	134	189	1565	105
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	284	268	232	65	162	62	59	1081	134	189	1565	105
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	67	58	16	41	16	15	270	34	47	391	26
Total Analysis Volume [veh/h]	284	268	232	65	162	62	59	1081	134	189	1565	105
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	40	0	10	30	0	11	46	0	14	49	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	20	20	29	9	9	73	62	62	73	64	64
g / C, Green / Cycle	0.27	0.18	0.18	0.27	0.08	0.08	0.66	0.56	0.56	0.66	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.13	0.04	0.06	0.06	0.03	0.33	0.32	0.11	0.45	0.45
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	474	347	328	338	161	152	637	1067	1011	872	1098	1040
d1, Uniform Delay [s]	35.14	42.84	42.24	30.70	49.17	49.01	6.56	15.89	15.61	7.09	17.90	17.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.22	3.69	2.79	0.27	6.29	5.61	0.06	2.45	2.37	0.57	5.58	5.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.77	0.71	0.19	0.73	0.70	0.09	0.60	0.57	0.22	0.78	0.78
d, Delay for Lane Group [s/veh]	36.36	46.52	45.03	30.98	55.46	54.62	6.62	18.34	17.98	7.66	23.48	23.63
Lane Group LOS	D	D	D	C	E	D	A	B	B	A	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.75	7.25	6.14	1.34	3.44	3.07	0.47	10.72	9.64	1.72	17.38	16.42
50th-Percentile Queue Length [ft/ln]	168.76	181.33	153.56	33.59	85.90	76.73	11.68	268.09	241.02	42.94	434.46	410.41
95th-Percentile Queue Length [veh/ln]	11.01	11.67	10.21	2.42	6.18	5.52	0.84	16.09	14.73	3.09	24.22	23.06
95th-Percentile Queue Length [ft/ln]	275.29	291.75	255.18	60.47	154.62	138.11	21.03	402.35	368.32	77.29	605.38	576.53

**Movement, Approach, & Intersection Results**

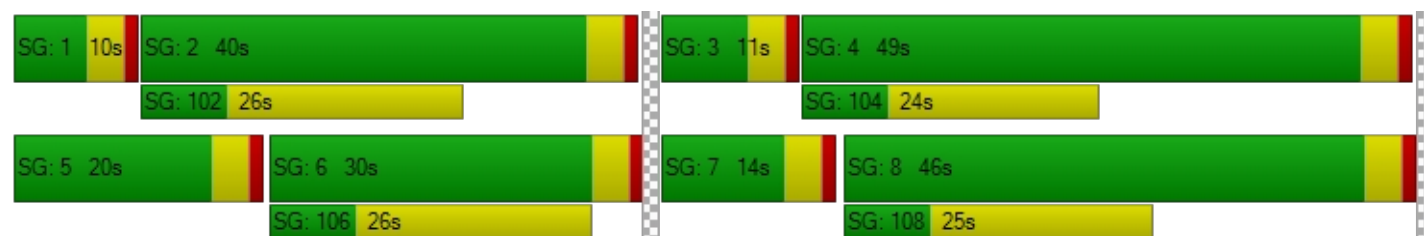
d_M, Delay for Movement [s/veh]	36.36	46.52	45.03	30.98	55.23	54.62	6.62	18.19	17.98	7.66	23.55	23.63
Movement LOS	D	D	D	C	E	D	A	B	B	A	C	C
d_A, Approach Delay [s/veh]	42.40			49.64			17.63			21.94		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	26.35											
Intersection LOS	C											
Intersection V/C	0.783											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.713			2.366			2.972			2.959		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			473			764			818		
d_b, Bicycle Delay [s]	24.89			32.07			21.02			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.853			1.798			2.611			3.093		
Bicycle LOS	C			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	88	242	205	55	118	72	48	1254	92	112	1534	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	242	205	55	118	72	48	1254	92	112	1534	53
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	61	51	14	30	18	12	314	23	28	384	13
Total Analysis Volume [veh/h]	88	242	205	55	118	72	48	1254	92	112	1534	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	63	0	0	63	0	24	37	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	85	75	75	85	76	76
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.77	0.68	0.68	0.77	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.11	0.03	0.11	0.03	0.37	0.36	0.06	0.43	0.43
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	131	291	275	89	275	1060	1300	1232	1145	1321	1251
d1, Uniform Delay [s]	41.48	45.21	44.52	40.69	44.11	2.88	8.66	8.56	2.99	8.97	8.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	6.16	3.98	6.84	3.08	0.02	1.59	1.61	0.17	2.18	2.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.67	0.83	0.74	0.62	0.69	0.05	0.54	0.53	0.10	0.62	0.62
d, Delay for Lane Group [s/veh]	47.32	51.36	48.50	47.53	47.18	2.90	10.26	10.18	3.16	11.15	11.21
Lane Group LOS	D	D	D	D	D	A	B	B	A	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.34	6.87	5.62	1.47	5.12	0.20	8.02	7.38	0.53	10.00	9.42
50th-Percentile Queue Length [ft/ln]	58.50	171.84	140.60	36.83	127.99	5.07	200.51	184.61	13.33	250.05	235.62
95th-Percentile Queue Length [veh/ln]	4.21	11.17	9.51	2.65	8.83	0.37	12.66	11.84	0.96	15.19	14.46
95th-Percentile Queue Length [ft/ln]	105.30	279.33	237.82	66.30	220.76	9.13	316.62	296.02	24.00	379.71	361.48

**Movement, Approach, & Intersection Results**

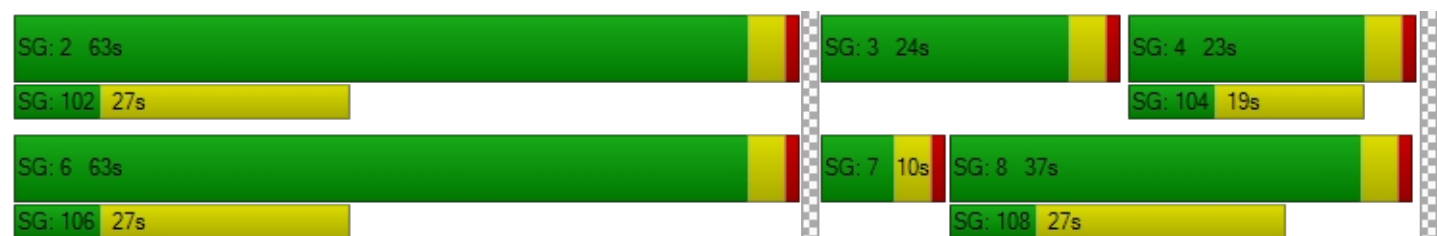
d_M, Delay for Movement [s/veh]	47.32	51.36	48.50	47.53	47.18	47.18	2.90	10.22	10.18	3.16	11.18	11.21
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	49.60			47.26			9.97			10.65		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	18.10											
Intersection LOS	B											
Intersection V/C	0.634											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.462			2.190			3.037			3.014		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1073			1073			600			345		
d_b, Bicycle Delay [s]	11.82			11.82			26.95			37.64		
I_b,int, Bicycle LOS Score for Intersection	2.442			1.964			2.710			2.961		
Bicycle LOS	B			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.825

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	85	402	68	312	387	545	439	869	50	124	1062	275
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	402	68	312	387	545	439	869	50	124	1062	275
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	101	17	78	97	136	110	217	13	31	266	69
Total Analysis Volume [veh/h]	85	402	68	312	387	545	439	869	50	124	1062	275
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	15	38	38	20	47	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	33	33	11	37	58	16	41	41	9	34	34
g / C, Green / Cycle	0.06	0.30	0.30	0.10	0.34	0.52	0.15	0.37	0.37	0.08	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.04	0.09	0.10	0.30	0.13	0.23	0.03	0.07	0.28	0.15
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	111	1143	541	354	1293	941	512	1396	661	154	1166	552
d1, Uniform Delay [s]	50.92	30.14	28.01	48.87	26.71	18.01	45.93	28.59	22.68	49.48	36.75	31.25
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.43	0.85	0.48	7.18	0.59	2.60	4.30	0.46	0.05	9.39	3.16	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.35	0.13	0.88	0.30	0.58	0.86	0.62	0.08	0.80	0.91	0.50
d, Delay for Lane Group [s/veh]	61.35	30.99	28.48	56.06	27.30	20.61	50.24	29.05	22.73	58.87	39.91	31.95
Lane Group LOS	E	C	C	E	C	C	D	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.63	4.29	1.38	4.57	3.83	9.84	6.14	9.34	0.85	3.75	13.99	6.04
50th-Percentile Queue Length [ft/ln]	65.67	107.37	34.49	114.26	95.78	245.95	153.47	233.58	21.34	93.63	349.80	151.10
95th-Percentile Queue Length [veh/ln]	4.73	7.69	2.48	8.08	6.90	14.98	10.20	14.36	1.54	6.74	20.13	10.08
95th-Percentile Queue Length [ft/ln]	118.20	192.33	62.07	201.91	172.40	374.55	255.05	358.90	38.42	168.53	503.17	251.90

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	61.35	30.99	28.48	56.06	27.30	20.61	50.24	29.05	22.73	58.87	39.91	31.95
Movement LOS	E	C	C	E	C	C	D	C	C	E	D	C
d_A, Approach Delay [s/veh]	35.33			31.58			35.67			40.02		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	35.90											
Intersection LOS	D											
Intersection V/C	0.825											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.644			2.932			3.028			2.903		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			618			782			673		
d_b, Bicycle Delay [s]	29.09			26.25			20.40			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.017			2.586			2.680			2.765		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	30	44	53	0	254	130	52	390	0
Total Analysis Volume [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	69	0	0	31	0	10	41	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	63	63	15	81
g / C, Green / Cycle		0.19	0.19	0.57	0.57	0.13	0.74
(v / s)_i Volume / Saturation Flow Rate		0.16	0.12	0.27	0.29	0.11	0.41
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		339	339	2161	1023	241	2809
d1, Uniform Delay [s]		43.31	41.05	13.96	14.37	46.55	6.35
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.78	1.88	0.73	1.79	8.32	0.80
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.62	0.47	0.51	0.85	0.56
d, Delay for Lane Group [s/veh]		50.09	42.93	14.69	16.16	54.87	7.15
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.34	5.41	7.34	8.00	6.04	7.04
50th-Percentile Queue Length [ft/ln]		208.48	135.37	183.53	199.94	151.02	176.12
95th-Percentile Queue Length [veh/ln]		13.08	9.23	11.78	12.64	10.07	11.40
95th-Percentile Queue Length [ft/ln]		326.88	230.78	294.62	315.89	251.79	284.94

**Movement, Approach, & Intersection Results**

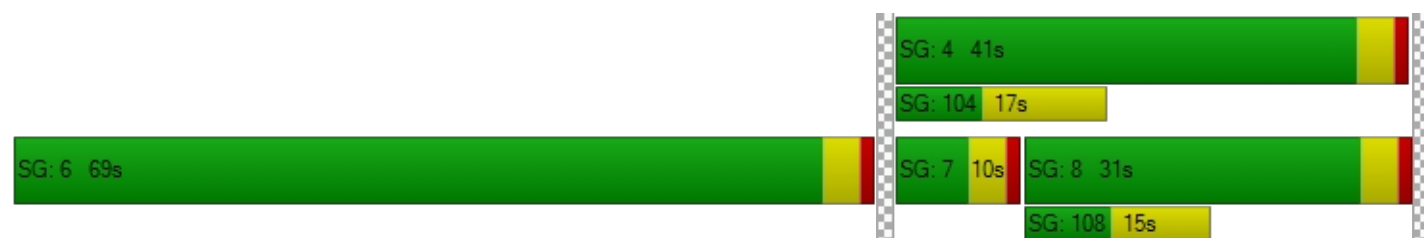
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	50.09	50.09	42.93	0.00	14.69	16.16	54.87	7.15	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			47.10			15.19			12.71		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.28											
Intersection LOS	B											
Intersection V/C	0.644											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.308			1.971			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			1182			491			673		
d_b, Bicycle Delay [s]	55.00			9.20			31.31			24.22		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.393			2.402			3.017		
Bicycle LOS	D			B			B			C		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	0	122	0	0	0	36	243	0	0	306	51
Total Analysis Volume [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	81	0	0	0	0	0	10	29	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.24	0.24	0.24		0.10	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.38	0.40
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	438	438	438		179	2598	1042	987
d1, Uniform Delay [s]	39.63	39.63	39.63		48.53	7.39	17.99	18.61
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.58	4.58	4.58		8.56	0.41	3.68	4.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.81	0.37	0.69	0.72
d, Delay for Lane Group [s/veh]	44.22	44.22	44.22		57.09	7.81	21.67	23.23
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.01	10.01	10.01		4.31	4.58	13.57	14.20
50th-Percentile Queue Length [ft/ln]	250.22	250.22	250.22		107.76	114.61	339.21	355.05
95th-Percentile Queue Length [veh/ln]	15.20	15.20	15.20		7.72	8.10	19.61	20.38
95th-Percentile Queue Length [ft/ln]	379.93	379.93	379.93		192.88	202.39	490.23	509.56

**Movement, Approach, & Intersection Results**

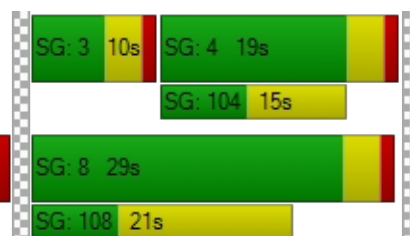
d_M, Delay for Movement [s/veh]	44.22	0.00	44.22	0.00	0.00	0.00	57.09	7.81	0.00	0.00	22.32	23.23
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.22			0.00			14.20			22.45		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.55											
Intersection LOS	C											
Intersection V/C	0.767											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	1.774	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	455	273
d_b, Bicycle Delay [s]	55.00	55.00	32.84	41.02
I_b,int, Bicycle LOS Score for Intersection	5.969	4.132	2.482	2.739
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



SG: 5 81s



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.491

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	46	1104	81	57	884	46	19	44	49	100	52	84
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	1104	81	57	884	46	19	44	49	100	52	84
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	276	20	14	221	12	5	11	12	25	13	21
Total Analysis Volume [veh/h]	46	1104	81	57	884	46	19	44	49	100	52	84
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.32	0.32	0.03	0.25	0.25	0.06	0.13
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1277	1478	1400	1221	1478	1400	307	316
d1, Uniform Delay [s]	2.78	4.01	3.97	2.80	3.63	3.61	42.31	45.66
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.87	0.88	0.07	0.59	0.60	0.72	3.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.42	0.41	0.05	0.33	0.32	0.36	0.75
d, Delay for Lane Group [s/veh]	2.83	4.88	4.85	2.87	4.22	4.21	43.03	49.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.20	3.92	3.60	0.25	2.77	2.57	2.81	6.57
50th-Percentile Queue Length [ft/ln]	5.08	97.90	90.06	6.37	69.16	64.26	70.37	164.28
95th-Percentile Queue Length [veh/ln]	0.37	7.05	6.48	0.46	4.98	4.63	5.07	10.78
95th-Percentile Queue Length [ft/ln]	9.15	176.23	162.12	11.47	124.48	115.67	126.67	269.39

**Movement, Approach, & Intersection Results**

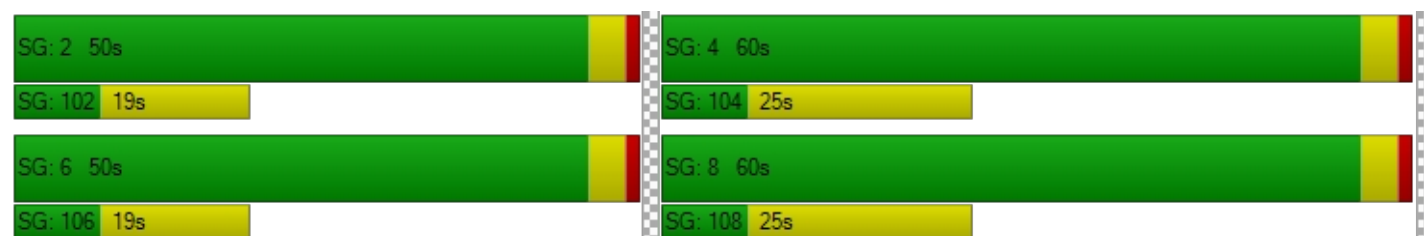
d_M, Delay for Movement [s/veh]	2.83	4.86	4.85	2.87	4.22	4.21	43.03	43.03	43.03	49.20	49.20	49.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.79			4.14			43.03			49.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.29											
Intersection LOS	B											
Intersection V/C	0.491											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.893			2.764			1.915			2.009		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.575			2.374			1.744			1.949		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	113	1060	197	48	1017	100	132	599	116	219	747	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	113	1060	197	48	1017	100	132	599	116	219	747	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	265	49	12	254	25	33	150	29	55	187	18
Total Analysis Volume [veh/h]	113	1060	197	48	1017	100	132	599	116	219	747	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	12	33	0	10	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	47	39	39	47	37	37	55	41	41	55	44	44
g / C, Green / Cycle	0.43	0.35	0.35	0.43	0.34	0.34	0.50	0.37	0.37	0.50	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.11	0.03	0.31	0.30	0.07	0.16	0.06	0.12	0.20	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	343	1333	631	414	643	609	722	1402	664	777	1523	722
d1, Uniform Delay [s]	19.08	32.18	26.06	18.38	34.75	34.29	15.01	26.02	23.43	15.84	24.59	20.56
k, delay calibration	0.11	0.11	0.11	0.11	0.20	0.18	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.55	1.12	0.28	0.12	8.85	6.94	0.12	0.95	0.57	0.91	1.13	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.33	0.80	0.31	0.12	0.91	0.88	0.18	0.43	0.17	0.28	0.49	0.10
d, Delay for Lane Group [s/veh]	19.64	33.30	26.34	18.50	43.60	41.23	15.13	26.98	24.00	16.74	25.72	20.83
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.81	12.68	3.80	0.73	16.15	14.37	1.80	6.01	2.14	3.30	7.40	1.18
50th-Percentile Queue Length [ft/ln]	45.20	316.96	95.05	18.30	403.66	359.25	45.00	150.22	53.41	82.60	184.95	29.38
95th-Percentile Queue Length [veh/ln]	3.25	18.52	6.84	1.32	22.74	20.59	3.24	10.03	3.85	5.95	11.86	2.12
95th-Percentile Queue Length [ft/ln]	81.36	462.95	171.10	32.94	568.41	514.67	81.00	250.73	96.14	148.68	296.46	52.88

**Movement, Approach, & Intersection Results**

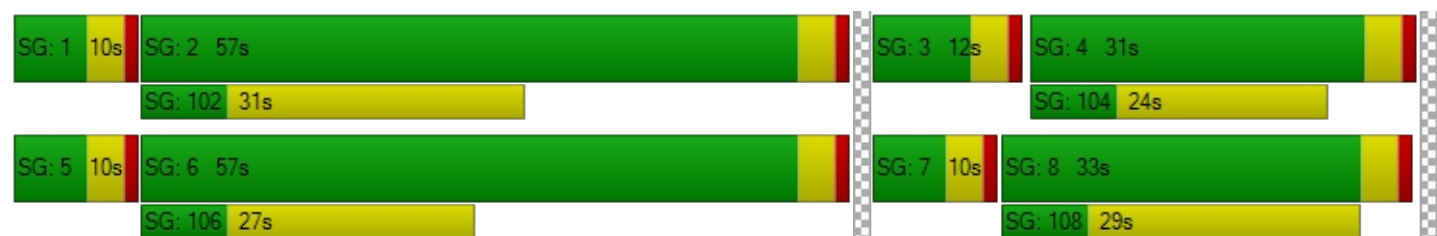
d_M, Delay for Movement [s/veh]	19.64	33.30	26.34	18.50	42.59	41.23	15.13	26.98	24.00	16.74	25.72	20.83
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	31.17			41.48			24.72			23.49		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.85											
Intersection LOS	C											
Intersection V/C	0.686											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.026			2.862			2.813			2.793		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			491		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.690			2.521			2.258			2.414		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	142	1011	212	46	804	91	117	642	97	353	821	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	142	1011	212	46	804	91	117	642	97	353	821	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	253	53	12	201	23	29	161	24	88	205	21
Total Analysis Volume [veh/h]	142	1011	212	46	804	91	117	642	97	353	821	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	37	0	33	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	34	34	43	33	33	9	42	42	14	46	46
g / C, Green / Cycle	0.39	0.31	0.31	0.39	0.30	0.30	0.08	0.38	0.38	0.12	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.12	0.03	0.25	0.24	0.07	0.17	0.05	0.10	0.22	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	385	1176	557	345	563	533	148	1437	681	437	1599	757
d1, Uniform Delay [s]	22.40	35.78	29.76	21.17	36.18	35.76	49.58	25.61	22.50	46.88	23.56	19.38
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	1.97	0.43	0.17	3.27	2.85	8.98	1.01	0.44	3.57	1.18	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.86	0.38	0.13	0.83	0.80	0.79	0.45	0.14	0.81	0.51	0.11
d, Delay for Lane Group [s/veh]	22.99	37.75	30.19	21.34	39.45	38.61	58.56	26.62	22.94	50.45	24.74	19.68
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.51	12.88	4.45	0.76	12.08	10.86	3.52	6.42	1.73	4.90	8.01	1.38
50th-Percentile Queue Length [ft/ln]	62.67	322.04	111.21	19.12	302.02	271.58	88.01	160.47	43.34	122.57	200.17	34.57
95th-Percentile Queue Length [veh/ln]	4.51	18.77	7.91	1.38	17.78	16.27	6.34	10.57	3.12	8.53	12.65	2.49
95th-Percentile Queue Length [ft/ln]	112.80	469.19	197.69	34.42	444.52	406.71	158.43	264.35	78.00	213.35	316.19	62.22

**Movement, Approach, & Intersection Results**

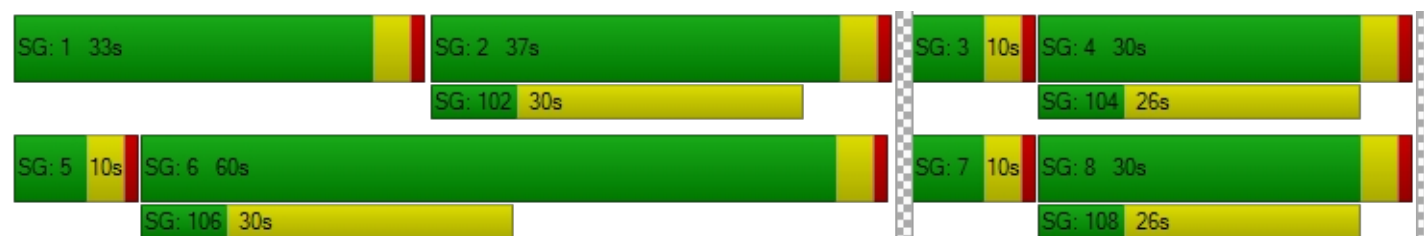
d_M, Delay for Movement [s/veh]	22.99	37.75	30.19	21.34	39.09	38.61	58.56	26.62	22.94	50.45	24.74	19.68
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	B
d_A, Approach Delay [s/veh]	35.04			38.18			30.57			31.60		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.86											
Intersection LOS	C											
Intersection V/C	0.680											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.888			2.729			2.836			2.926		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			1018			473			473		
d_b, Bicycle Delay [s]	26.95			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.686			2.336			2.266			2.598		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.986

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	59	1336	50	22	46	1386	60	114	86	67	132	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	1336	50	22	46	1386	60	114	86	67	132	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	334	13	6	12	347	15	29	22	17	33	4
Total Analysis Volume [veh/h]	59	1336	50	22	46	1386	60	114	86	67	132	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	79	0	0	79	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.38	0.37	0.01	0.02	0.77	0.14	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	72	1454	1377	1142	1454	1377	332	74	291
d1, Uniform Delay [s]	3.12	4.85	4.82	3.06	3.10	12.87	45.03	40.02	41.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	63.64	1.19	1.23	0.03	0.04	25.76	4.09	28.70	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.49	0.49	0.02	0.03	1.01	0.78	0.90	0.50
d, Delay for Lane Group [s/veh]	66.76	6.04	6.05	3.09	3.14	38.63	49.12	68.72	43.31
Lane Group LOS	E	A	A	A	A	F	D	E	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.53	5.40	5.06	0.11	0.22	35.03	7.27	2.17	3.74
50th-Percentile Queue Length [ft/ln]	38.36	135.05	126.49	2.63	5.46	875.77	181.67	54.29	93.47
95th-Percentile Queue Length [veh/ln]	2.76	9.21	8.75	0.19	0.39	45.00	11.69	3.91	6.73
95th-Percentile Queue Length [ft/ln]	69.05	230.34	218.71	4.74	9.84	1125.10	292.19	97.72	168.25

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	66.76	6.04	6.05	3.09	3.14	38.63	49.12	49.12	49.12	68.72	43.31	43.31
Movement LOS	E	A	A	A	A	F	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	8.52			36.97			49.12			51.26		
Approach LOS	A			D			D			D		
d_I, Intersection Delay [s/veh]	26.63											
Intersection LOS	C											
Intersection V/C	0.986											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.725			2.953			2.704			2.111		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1364			1364			491			491		
d_b, Bicycle Delay [s]	5.57			5.57			31.31			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.752			2.759			1.989			1.913		
Bicycle LOS	C			C			A			A		


**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 10.1  
Level Of Service: B  
Volume to Capacity (v/c): 0.526**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	125	1301	75	55	1195	67	73	39	92	99	51	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	1301	75	55	1195	67	73	39	92	99	51	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	325	19	14	299	17	18	10	23	25	13	12
Total Analysis Volume [veh/h]	125	1301	75	55	1195	67	73	39	92	99	51	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	87	87	87	87	87	87	15	15
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.79	0.79	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.37	0.03	0.34	0.34	0.11	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1258	1511	1431	1231	1511	1431	282	287
d1, Uniform Delay [s]	2.48	3.69	3.66	2.38	3.52	3.49	46.65	46.42
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	1.06	1.09	0.07	0.91	0.93	3.49	2.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.47	0.46	0.04	0.43	0.43	0.72	0.68
d, Delay for Lane Group [s/veh]	2.64	4.74	4.74	2.45	4.42	4.41	50.14	49.27
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.51	4.29	3.99	0.22	3.75	3.48	5.70	5.42
50th-Percentile Queue Length [ft/ln]	12.73	107.18	99.83	5.38	93.65	86.93	142.62	135.50
95th-Percentile Queue Length [veh/ln]	0.92	7.68	7.19	0.39	6.74	6.26	9.62	9.24
95th-Percentile Queue Length [ft/ln]	22.91	192.07	179.70	9.68	168.57	156.47	240.55	230.95

**Movement, Approach, & Intersection Results**

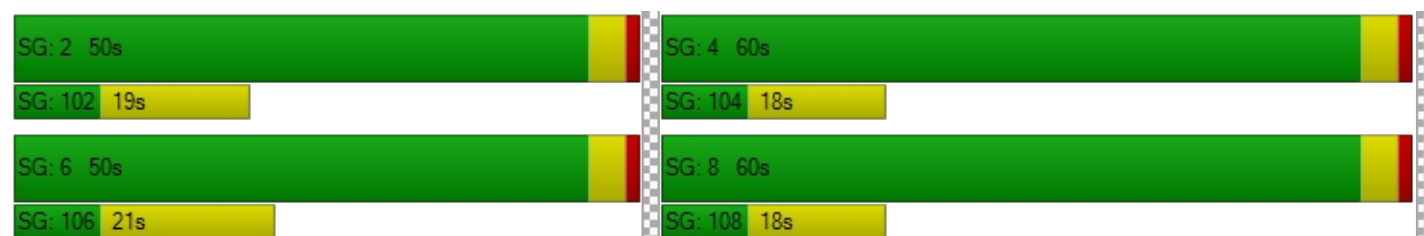
d_M, Delay for Movement [s/veh]	2.64	4.74	4.74	2.45	4.42	4.41	50.14	50.14	50.14	49.27	49.27	49.27
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.57			4.34			50.14			49.27		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.08											
Intersection LOS	B											
Intersection V/C	0.526											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.013			2.947			2.120			1.981		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.798			2.646			1.896			1.883		
Bicycle LOS	C			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.796

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	279	1273	229	191	1153	192	190	743	198	214	1056	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	279	1273	229	191	1153	192	190	743	198	214	1056	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	318	57	48	288	48	48	186	50	54	264	42
Total Analysis Volume [veh/h]	279	1273	229	191	1153	192	190	743	198	214	1056	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	42	0	11	39	0	18	39	0	18	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	38	38	7	35	35	13	35	35	14	36	36
g / C, Green / Cycle	0.09	0.35	0.35	0.06	0.32	0.32	0.12	0.32	0.32	0.13	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.08	0.34	0.13	0.05	0.29	0.13	0.11	0.13	0.11	0.12	0.19	0.09
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	318	1311	621	223	1207	572	219	1805	570	233	1847	583
d1, Uniform Delay [s]	49.39	35.49	27.04	51.01	36.09	29.56	47.43	29.53	28.86	47.33	30.84	27.68
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	6.60	0.37	9.17	3.18	0.49	9.89	0.70	1.67	13.86	1.29	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.88	0.97	0.37	0.86	0.91	0.42	0.87	0.41	0.35	0.92	0.57	0.28
d, Delay for Lane Group [s/veh]	57.03	42.09	27.40	60.18	39.27	30.05	57.32	30.23	30.53	61.20	32.13	28.90
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.11	17.59	4.56	2.88	14.51	5.07	5.69	5.24	4.26	6.66	7.90	3.45
50th-Percentile Queue Length [ft/ln]	102.77	439.80	113.90	72.06	362.67	126.81	142.26	130.91	106.61	166.58	197.50	86.21
95th-Percentile Queue Length [veh/ln]	7.40	24.47	8.06	5.19	20.75	8.77	9.60	8.99	7.65	10.90	12.51	6.21
95th-Percentile Queue Length [ft/ln]	184.99	611.76	201.41	129.71	518.83	219.15	240.06	224.73	191.28	272.42	312.74	155.17

**Movement, Approach, & Intersection Results**

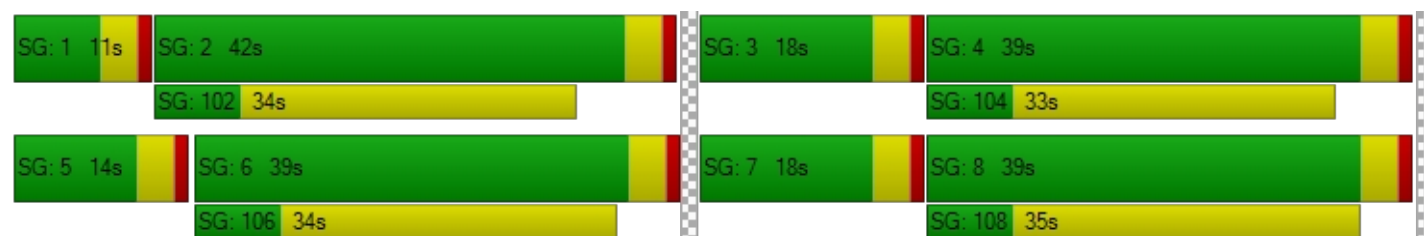
d_M, Delay for Movement [s/veh]	57.03	42.09	27.40	60.18	38.88	30.05	57.32	30.23	30.53	61.20	32.13	28.90
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	42.54			40.43			34.83			36.09		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	38.93											
Intersection LOS	D											
Intersection V/C	0.796											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.143			3.044			3.059			3.052		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			636			636		
d_b, Bicycle Delay [s]	23.56			25.57			25.57			25.57		
I_b,int, Bicycle LOS Score for Intersection	3.029			2.404			2.182			2.349		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.889

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	243	1209	101	188	1005	189	209	708	145	254	801	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	243	1209	101	188	1005	189	209	708	145	254	801	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	302	25	47	251	47	52	177	36	64	200	35
Total Analysis Volume [veh/h]	243	1209	101	188	1005	189	209	708	145	254	801	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	50	0	10	47	0	12	40	0	10	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	39	49	36	36	15	39	39	10	34	34
g / C, Green / Cycle	0.45	0.36	0.36	0.45	0.33	0.33	0.13	0.35	0.35	0.09	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.14	0.32	0.06	0.10	0.26	0.11	0.12	0.18	0.08	0.07	0.26	0.25
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	451	1355	642	348	1253	593	239	1329	630	323	587	556
d1, Uniform Delay [s]	19.33	33.45	24.16	18.67	33.67	27.67	46.87	28.57	25.43	48.96	35.54	34.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.00	2.27	0.11	1.31	1.24	0.31	9.62	1.50	0.90	4.26	13.63	11.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.89	0.16	0.54	0.80	0.32	0.87	0.53	0.24	0.79	0.84	0.80
d, Delay for Lane Group [s/veh]	20.34	35.72	24.28	19.98	34.91	27.97	56.49	30.08	26.33	53.22	49.17	46.39
Lane Group LOS	C	D	C	B	C	C	E	C	C	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.05	15.29	1.81	3.06	12.24	3.77	6.23	7.59	2.96	3.60	14.40	12.55
50th-Percentile Queue Length [ft/ln]	101.22	382.32	45.36	76.44	305.97	94.17	155.79	189.79	73.91	90.01	359.94	313.68
95th-Percentile Queue Length [veh/ln]	7.29	21.71	3.27	5.50	17.98	6.78	10.33	12.11	5.32	6.48	20.62	18.36
95th-Percentile Queue Length [ft/ln]	182.19	542.65	81.65	137.60	449.41	169.50	258.13	302.76	133.04	162.01	515.51	458.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	20.34	35.72	24.28	19.98	34.91	27.97	56.49	30.05	26.33	53.22	48.10	46.39
Movement LOS	C	D	C	B	C	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	32.57			31.93			34.74			48.99		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	36.62											
Intersection LOS	D											
Intersection V/C	0.889											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.943			2.940			2.956			3.009		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			782			655			618		
d_b, Bicycle Delay [s]	18.62			20.40			24.89			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.841			2.700			2.144			2.544		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.654

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	477	0	0	348	128	0	0	0	77	95	91
Total Analysis Volume [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	68	59	59		24	24	24
g / C, Green / Cycle	0.05	0.68	0.59	0.59		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.33	0.33	0.35		0.17	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3881	2230	1056		431	909	431
d1, Uniform Delay [s]	45.77	7.66	12.81	13.18		34.89	32.16	36.23
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.41	0.45	1.06	2.53		2.21	0.31	4.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.49	0.57	0.60		0.71	0.42	0.84
d, Delay for Lane Group [s/veh]	47.18	8.11	13.87	15.70		37.10	32.46	40.71
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.96	5.88	8.50	9.14		7.02	3.89	8.81
50th-Percentile Queue Length [ft/ln]	23.97	147.01	212.41	228.58		175.47	97.29	220.15
95th-Percentile Queue Length [veh/ln]	1.73	9.86	13.28	14.10		11.36	7.00	13.67
95th-Percentile Queue Length [ft/ln]	43.14	246.44	331.92	352.56		284.09	175.12	341.82

**Movement, Approach, & Intersection Results**

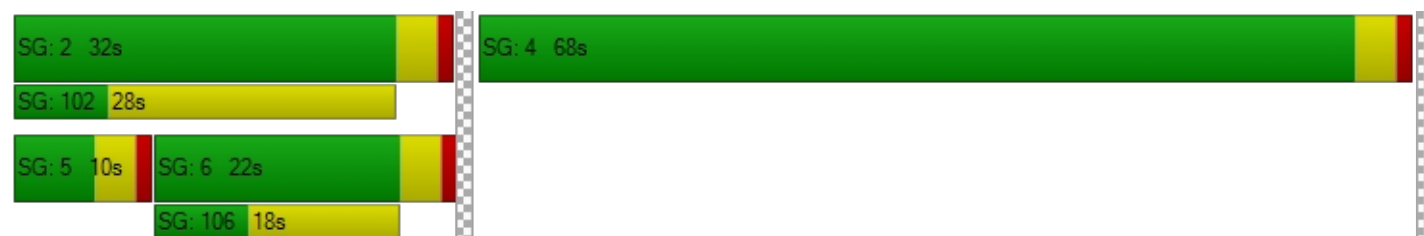
d_M, Delay for Movement [s/veh]	47.18	8.11	0.00	0.00	14.03	15.70	0.00	0.00	0.00	37.10	32.46	40.71
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.62			14.48			0.00			36.67		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.24											
Intersection LOS	B											
Intersection V/C	0.654											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.192			2.392		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.651			2.606			4.132			2.425		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	303	0	0	304	84	0	0	0	42	142	154
Total Analysis Volume [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	43	43		38	38	38
g / C, Green / Cycle	0.07	0.54	0.43	0.43		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.27	0.29		0.21	0.19	0.34
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	3078	1631	772		684	722	684
d1, Uniform Delay [s]	45.74	13.45	22.40	22.87		24.20	23.76	29.24
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.38	1.90	4.59		0.67	0.54	9.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.39	0.63	0.67		0.54	0.50	0.90
d, Delay for Lane Group [s/veh]	56.22	13.83	24.30	27.47		24.88	24.30	38.54
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	5.19	9.65	10.40		6.83	6.54	15.23
50th-Percentile Queue Length [ft/ln]	70.64	129.78	241.32	260.12		170.64	163.61	380.68
95th-Percentile Queue Length [veh/ln]	5.09	8.93	14.75	15.69		11.11	10.74	21.63
95th-Percentile Queue Length [ft/ln]	127.15	223.19	368.71	392.37		277.75	268.50	540.67

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.22	13.83	0.00	0.00	24.77	27.47	0.00	0.00	0.00	24.88	24.51	38.54
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.08			25.35			0.00			30.96		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.57											
Intersection LOS	C											
Intersection V/C	0.780											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.209			2.384		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.282			2.414			4.132			2.674		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	336	54	68	369	0	176	73	37	0	0	0
Total Analysis Volume [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	10	68	24	24	24	
g / C, Green / Cycle	0.54	0.54	0.10	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.20	0.15	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3073	971	339	3854	854	463	439	
d1, Uniform Delay [s]	13.90	12.05	44.22	7.08	35.77	33.78	31.11	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.45	0.52	4.42	0.29	2.07	1.42	0.44	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.44	0.22	0.80	0.38	0.82	0.63	0.33	
d, Delay for Lane Group [s/veh]	14.35	12.57	48.64	7.37	37.84	35.19	31.55	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.94	2.55	3.48	4.15	8.22	6.43	2.93	
50th-Percentile Queue Length [ft/ln]	148.60	63.70	87.09	103.86	205.38	160.85	73.32	
95th-Percentile Queue Length [veh/ln]	9.94	4.59	6.27	7.48	12.92	10.59	5.28	
95th-Percentile Queue Length [ft/ln]	248.56	114.66	156.75	186.95	322.90	264.85	131.97	

**Movement, Approach, & Intersection Results**

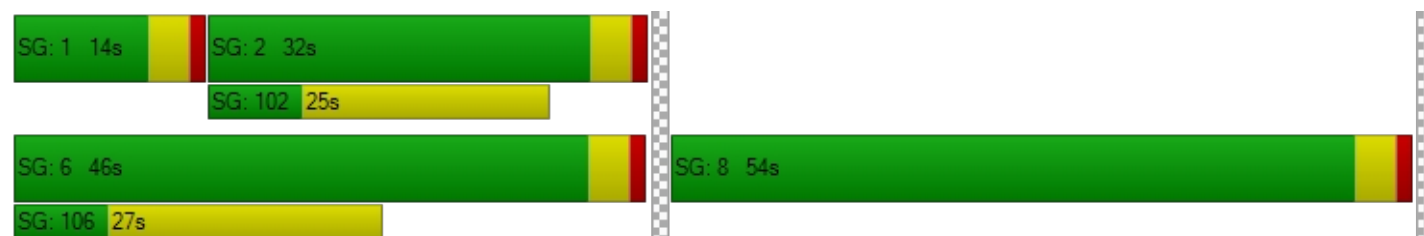
d_M, Delay for Movement [s/veh]	0.00	14.35	12.57	48.64	7.37	0.00	37.84	35.19	31.55	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	14.11			13.80			36.36			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.70											
Intersection LOS	B											
Intersection V/C	0.585											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.414			2.099		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.520			3.442			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.616

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	247	52	102	236	0	80	104	14	0	0	0
Total Analysis Volume [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.20	0.19	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1917	908	490	2601	424	447	424	
d1, Uniform Delay [s]	15.54	15.78	41.85	6.62	36.72	36.24	30.18	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.67	1.54	3.74	0.39	5.46	3.83	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.42	0.44	0.83	0.36	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.21	17.32	45.60	7.01	42.18	40.07	30.33	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.67	5.97	5.11	3.83	9.11	8.84	1.10	
50th-Percentile Queue Length [ft/ln]	141.79	149.14	127.65	95.85	227.82	221.10	27.43	
95th-Percentile Queue Length [veh/ln]	9.58	9.97	8.81	6.90	14.06	13.72	1.97	
95th-Percentile Queue Length [ft/ln]	239.43	249.28	220.29	172.53	351.59	343.03	49.37	

**Movement, Approach, & Intersection Results**

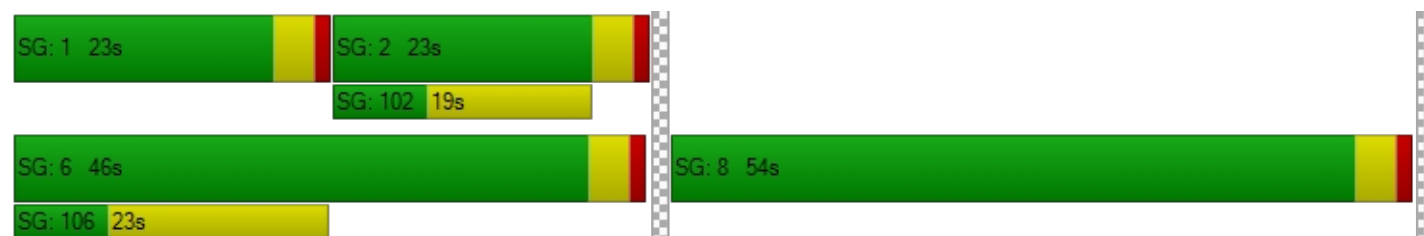
d_M, Delay for Movement [s/veh]	0.00	16.43	17.32	45.60	7.01	0.00	42.18	40.30	30.33	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	16.58			18.66			40.35			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.06											
Intersection LOS	C											
Intersection V/C	0.616											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.202			2.222		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.218			2.675			2.213			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.139

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	78	514	97	16	678
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	78	514	97	16	678
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	20	129	24	4	170
Total Analysis Volume [veh/h]	0	78	514	97	16	678
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.14	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	12.46	0.00	0.00	8.78	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.48	0.00	0.00	0.05	0.00
95th-Percentile Queue Length [ft/ln]	0.00	12.03	0.00	0.00	1.26	0.00
d_A, Approach Delay [s/veh]	12.46		0.00		0.20	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.80					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	892	223	80	587	0	46	0	54	272	0	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	892	223	80	587	0	46	0	54	272	0	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	223	56	20	147	0	12	0	14	68	0	18
Total Analysis Volume [veh/h]	0	892	223	80	587	0	46	0	54	272	0	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	74	74	83	83	19	19	19	19
g / C, Green / Cycle	0.67	0.67	0.76	0.76	0.17	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.29	0.31	0.04	0.15	0.03	0.03	0.15	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1272	1205	1179	2874	341	340	295	308
d1, Uniform Delay [s]	8.51	8.71	3.42	3.86	38.79	38.97	44.53	39.40
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	1.28	0.02	0.16	0.18	0.22	11.54	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.46	0.07	0.20	0.13	0.16	0.92	0.24
d, Delay for Lane Group [s/veh]	9.61	9.99	3.44	4.02	38.97	39.18	56.06	39.79
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.07	6.25	0.39	1.65	1.08	1.27	8.14	1.74
50th-Percentile Queue Length [ft/ln]	151.85	156.20	9.74	41.17	26.91	31.75	203.47	43.53
95th-Percentile Queue Length [veh/ln]	10.12	10.35	0.70	2.96	1.94	2.29	12.82	3.13
95th-Percentile Queue Length [ft/ln]	252.90	258.69	17.53	74.11	48.44	57.15	320.43	78.36

**Movement, Approach, & Intersection Results**

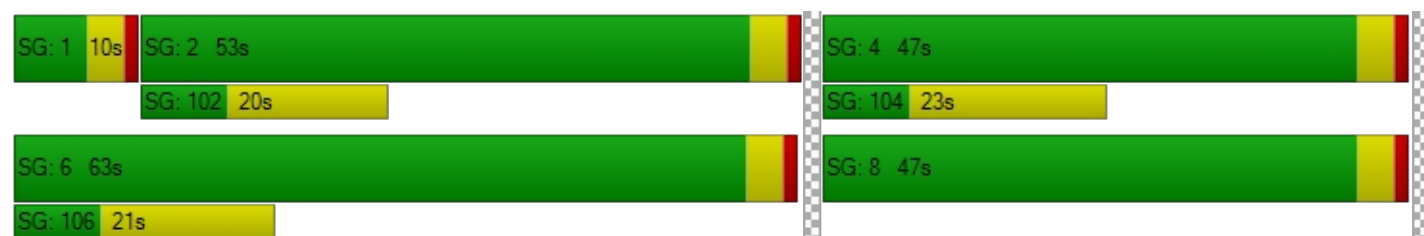
d_M, Delay for Movement [s/veh]	0.00	9.75	9.99	3.44	4.02	0.00	38.97	39.18	39.18	56.06	0.00	39.79
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	9.80			3.95			39.08			52.62		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	16.00											
Intersection LOS	B											
Intersection V/C	0.533											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.702			1.773			2.239		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.479			2.110			1.725			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.127

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	44	443	347	7	62	77
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	443	347	7	62	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	111	87	2	16	19
Total Analysis Volume [veh/h]	44	443	347	7	62	77
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.13	0.11
d_M, Delay for Movement [s/veh]	8.10	0.00	0.00	0.00	14.28	12.11
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.92	0.92
95th-Percentile Queue Length [ft/ln]	2.84	0.00	0.00	0.00	23.03	23.03
d_A, Approach Delay [s/veh]	0.73		0.00		13.08	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.22					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	72	480	429	1	7	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	72	480	429	1	7	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	120	107	0	2	27
Total Analysis Volume [veh/h]	72	480	429	1	7	109
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.02	0.17
d_M, Delay for Movement [s/veh]	8.40	0.00	0.00	0.00	14.85	12.14
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.20	0.00	0.00	0.00	0.70	0.70
95th-Percentile Queue Length [ft/ln]	5.10	0.00	0.00	0.00	17.47	17.47
d_A, Approach Delay [s/veh]	1.10		0.00		12.31	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.85					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.077

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	540	28	42	552	31	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	540	28	42	552	31	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	135	7	11	138	8	15
Total Analysis Volume [veh/h]	540	28	42	552	31	61
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**



V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.08	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	8.74	0.00	15.73	13.54
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.13	0.00	0.70	0.70
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.27	0.00	17.55	17.55
d_A, Approach Delay [s/veh]	0.00		0.62		14.28	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.34					
Intersection LOS	C					



**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.455

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	33	840	57	0	672	11	0	0	28	0	0	254
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	840	57	0	672	11	0	0	28	0	0	254
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	210	14	0	168	3	0	0	7	0	0	64
Total Analysis Volume [veh/h]	33	840	57	0	672	11	0	0	28	0	0	254
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.46
d_M, Delay for Movement [s/veh]	9.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.75	0.00	0.00	16.74
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	2.36
95th-Percentile Queue Length [ft/ln]	2.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.35	0.00	0.00	59.05
d_A, Approach Delay [s/veh]	0.32			0.00			10.75			16.74		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	2.56											
Intersection LOS	C											





*APPENDIX E-II*

**EXISTING PLUS PROJECT SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	92	536	104	228	610	167	161	602	93	117	810	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	536	104	228	610	167	161	602	93	117	810	229
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	134	26	57	153	42	40	151	23	29	203	57
Total Analysis Volume [veh/h]	92	536	104	228	610	167	161	602	93	117	810	229
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	43	0	11	43	0	14	43	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	57	57	7	58	58	10	24	24	6	20	20
g / C, Green / Cycle	0.05	0.52	0.52	0.06	0.53	0.53	0.09	0.22	0.22	0.05	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.06	0.07	0.14	0.14	0.09	0.12	0.13	0.03	0.14	0.13
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	182	2940	929	225	2007	951	165	838	397	189	1043	329
d1, Uniform Delay [s]	50.80	14.24	13.70	51.51	14.23	14.24	49.90	38.10	38.35	50.98	42.84	42.11
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.15	0.14	0.24	30.77	0.32	0.67	27.49	0.58	1.34	3.31	1.28	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.18	0.11	1.01	0.26	0.26	0.98	0.55	0.58	0.62	0.78	0.70
d, Delay for Lane Group [s/veh]	52.94	14.38	13.94	82.27	14.55	14.91	77.38	38.68	39.70	54.30	44.13	44.76
Lane Group LOS	D	B	B	F	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.29	2.38	1.38	4.06	3.61	3.52	5.66	5.61	5.68	1.66	7.08	6.04
50th-Percentile Queue Length [ft/ln]	32.19	59.55	34.39	101.55	90.27	88.07	141.50	140.26	142.07	41.59	176.99	151.02
95th-Percentile Queue Length [veh/ln]	2.32	4.29	2.48	7.31	6.50	6.34	9.56	9.49	9.59	2.99	11.44	10.07
95th-Percentile Queue Length [ft/ln]	57.94	107.20	61.90	182.79	162.48	158.53	239.05	237.37	239.80	74.85	286.08	251.79

**Movement, Approach, & Intersection Results**

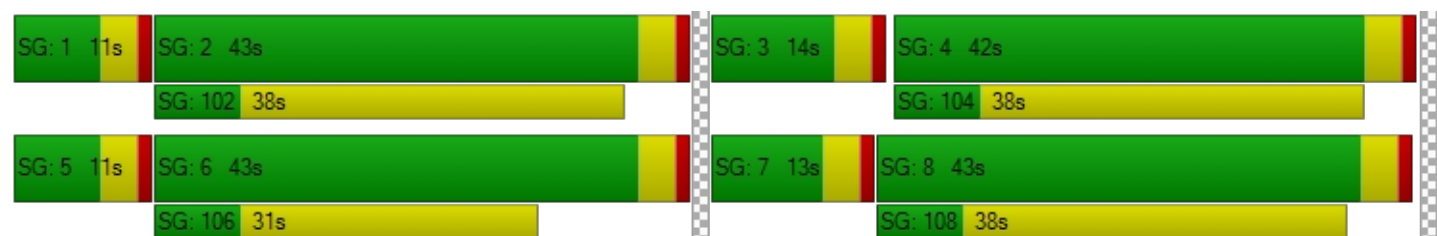
d_M, Delay for Movement [s/veh]	52.94	14.38	13.94	82.27	14.60	14.91	77.38	38.91	39.70	54.30	44.13	44.76
Movement LOS	D	B	B	F	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	19.16			30.00			46.23			45.28		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	36.30											
Intersection LOS	D											
Intersection V/C	0.464											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.027			2.970			2.872			3.085		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			709			709			691		
d_b, Bicycle Delay [s]	22.91			22.91			22.91			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.962			2.112			2.030			2.195		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	19	828	552	77	921	31	63	121	27	522	83	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	828	552	77	921	31	63	121	27	522	83	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	207	138	19	230	8	16	30	7	131	21	0
Total Analysis Volume [veh/h]	19	828	552	77	921	31	63	121	27	522	83	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	57	6	60	60	9	9	9	22	22
g / C, Green / Cycle	0.02	0.52	0.06	0.55	0.55	0.08	0.08	0.08	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.04	0.20	0.10	0.04	0.06	0.02	0.17	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	45	2952	100	2084	987	153	162	153	353	353
d1, Uniform Delay [s]	52.88	14.97	51.28	14.05	12.51	47.74	49.21	46.77	42.73	42.84
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.11	0.24	11.51	0.50	0.42	1.76	6.72	0.54	5.87	6.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.28	0.77	0.37	0.19	0.41	0.75	0.18	0.85	0.86
d, Delay for Lane Group [s/veh]	59.00	15.21	62.79	14.56	12.93	49.50	55.93	47.31	48.60	49.16
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.59	3.88	2.41	5.37	2.37	1.71	3.54	0.71	8.41	8.57
50th-Percentile Queue Length [ft/ln]	14.85	97.08	60.30	134.23	59.22	42.82	88.62	17.77	210.21	214.23
95th-Percentile Queue Length [veh/ln]	1.07	6.99	4.34	9.17	4.26	3.08	6.38	1.28	13.16	13.37
95th-Percentile Queue Length [ft/ln]	26.73	174.74	108.54	229.23	106.59	77.08	159.52	31.99	329.10	334.26

**Movement, Approach, & Intersection Results**

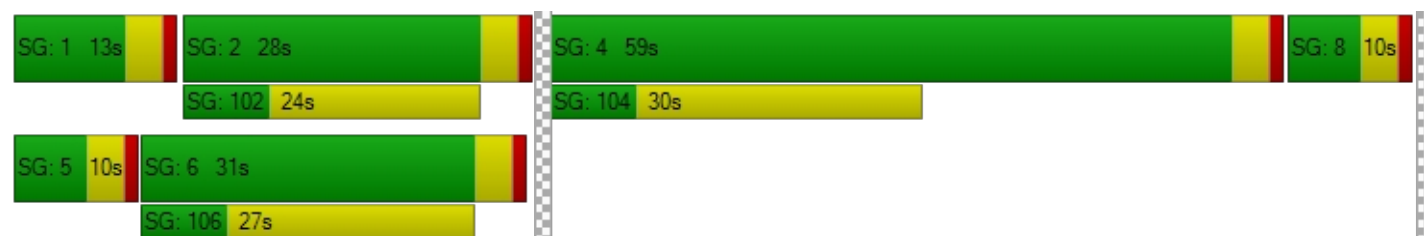
d_M, Delay for Movement [s/veh]	59.00	15.21	0.00	62.79	14.28	12.93	49.50	55.93	47.31	48.84	49.16	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	16.19			17.87			52.91			48.88		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.06											
Intersection LOS	C											
Intersection V/C	0.521											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.871			2.224			2.211		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.025			2.126			1.908			2.558		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	82	1091	43	264	1183	27	30	91	107	83	112	315
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1091	43	264	1183	27	30	91	107	83	112	315
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	273	11	66	296	7	8	23	27	21	28	79
Total Analysis Volume [veh/h]	82	1091	43	264	1183	27	30	91	107	83	112	315
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	55	0	18	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	7	65	65	14	73	73	19	19	19	19	19	37
g / C, Green / Cycle	0.06	0.59	0.59	0.13	0.66	0.66	0.17	0.17	0.17	0.17	0.17	0.33
(v / s)_i Volume / Saturation Flow Rate	0.05	0.31	0.30	0.08	0.31	0.02	0.02	0.05	0.06	0.05	0.06	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	109	1128	1068	450	2514	1191	245	321	304	263	321	601
d1, Uniform Delay [s]	50.85	13.14	13.06	45.16	9.14	6.39	38.61	39.88	40.37	39.80	40.35	29.57
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.19
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.12	1.71	1.76	1.22	0.63	0.04	0.22	0.48	0.69	0.68	0.65	1.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.52	0.51	0.59	0.47	0.02	0.12	0.28	0.35	0.32	0.35	0.52
d, Delay for Lane Group [s/veh]	60.97	14.85	14.82	46.38	9.77	6.43	38.83	40.36	41.06	40.48	40.99	30.80
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.53	8.61	8.03	3.47	6.62	0.22	0.70	2.19	2.62	2.01	2.73	6.88
50th-Percentile Queue Length [ft/ln]	63.13	215.27	200.77	86.70	165.46	5.39	17.53	54.80	65.42	50.16	68.36	171.91
95th-Percentile Queue Length [veh/ln]	4.55	13.42	12.68	6.24	10.84	0.39	1.26	3.95	4.71	3.61	4.92	11.18
95th-Percentile Queue Length [ft/ln]	113.63	335.58	316.96	156.06	270.94	9.71	31.55	98.65	117.76	90.29	123.04	279.42

**Movement, Approach, & Intersection Results**

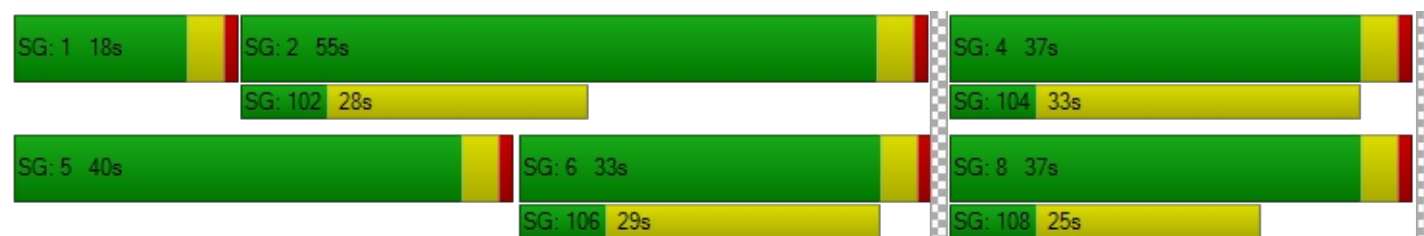
d_M, Delay for Movement [s/veh]	60.97	14.84	14.82	46.38	9.77	6.43	38.83	40.36	41.06	40.48	40.99	30.80
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	17.95			16.27			40.49			34.62		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	21.21											
Intersection LOS	C											
Intersection V/C	0.599											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.932			3.051			2.250			2.486		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			527			600			600		
d_b, Bicycle Delay [s]	15.82			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.563			2.776			1.936			2.401		
Bicycle LOS	B			C			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.469

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	229	260	146	88	180	21	16	307	131	99	290	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	229	260	146	88	180	21	16	307	131	99	290	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	65	37	22	45	5	4	77	33	25	73	34
Total Analysis Volume [veh/h]	229	260	146	88	180	21	16	307	131	99	290	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	30	0	0	49	49	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	39	39	20	20	63	20	20	20
g / C, Green / Cycle	0.35	0.35	0.35	0.35	0.35	0.18	0.18	0.57	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.08	0.05	0.11	0.01	0.16	0.07	0.06	0.12	0.11
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	637	637	637	637	637	182	348	1032	102	348	330
d1, Uniform Delay [s]	26.26	26.79	24.94	24.10	25.80	36.94	43.67	10.77	38.75	41.62	41.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.15	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	1.94	0.84	0.45	1.30	0.20	9.83	0.25	33.98	2.11	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.41	0.23	0.14	0.32	0.09	0.88	0.13	0.97	0.66	0.60
d, Delay for Lane Group [s/veh]	27.84	28.72	25.78	24.55	27.10	37.15	53.51	11.03	72.72	43.73	42.87
Lane Group LOS	C	C	C	C	C	D	D	B	E	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.70	5.46	2.82	1.64	4.04	0.37	9.02	1.50	3.28	5.93	5.05
50th-Percentile Queue Length [ft/ln]	117.43	136.48	70.59	40.95	100.98	9.16	225.60	37.62	81.89	148.24	126.30
95th-Percentile Queue Length [veh/ln]	8.25	9.29	5.08	2.95	7.27	0.66	13.95	2.71	5.90	9.92	8.74
95th-Percentile Queue Length [ft/ln]	206.28	232.28	127.06	73.71	181.77	16.48	348.76	67.72	147.41	248.07	218.45

**Movement, Approach, & Intersection Results**

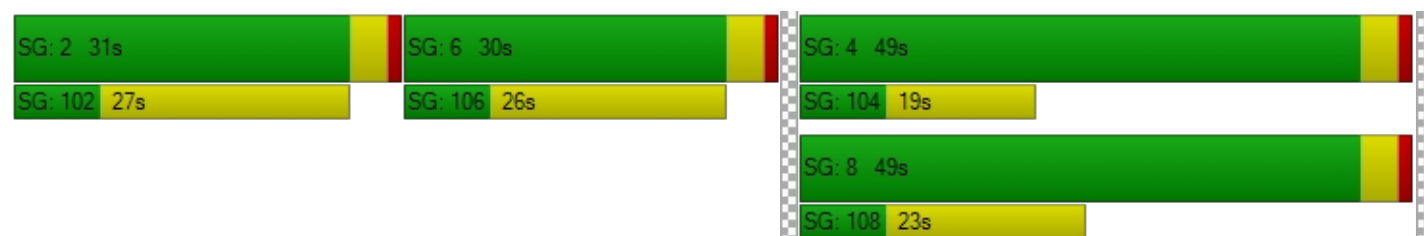
d_M, Delay for Movement [s/veh]	27.84	28.72	25.78	24.55	27.10	27.10	37.15	53.51	11.03	72.72	43.55	42.87
Movement LOS	C	C	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	27.73			26.32			40.67			48.87		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.44											
Intersection LOS	D											
Intersection V/C	0.469											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.536			2.200			2.503			2.400		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			818			818		
d_b, Bicycle Delay [s]	31.31			32.07			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.607			2.036			2.309			1.993		
Bicycle LOS	B			B			B			A		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.317

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	15	141	78	303	409	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	141	78	303	409	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	35	20	76	102	7
Total Analysis Volume [veh/h]	15	141	78	303	409	28
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.04	0.16	0.22	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	176	176	1426	1576	1576	1493
d1, Uniform Delay [s]	45.10	48.53	1.67	1.90	2.03	1.62
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	8.26	0.07	0.27	0.40	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.80	0.05	0.19	0.26	0.02
d, Delay for Lane Group [s/veh]	45.31	56.79	1.74	2.17	2.43	1.64
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.38	4.18	0.22	0.96	1.38	0.08
50th-Percentile Queue Length [ft/ln]	9.58	104.41	5.45	23.88	34.60	1.89
95th-Percentile Queue Length [veh/ln]	0.69	7.52	0.39	1.72	2.49	0.14
95th-Percentile Queue Length [ft/ln]	17.24	187.95	9.81	42.98	62.28	3.40

**Movement, Approach, & Intersection Results**

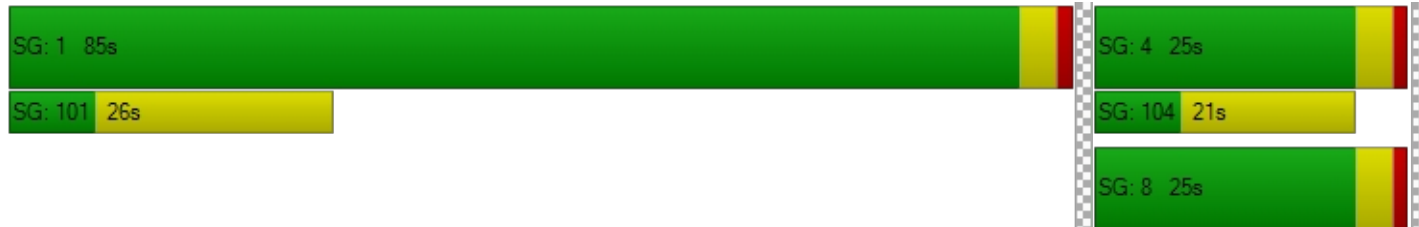
d_M, Delay for Movement [s/veh]	45.31	56.79	1.74	2.17	2.43	1.64
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.68		2.08		2.38	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	10.80					
Intersection LOS	B					
Intersection V/C	0.317					

**Other Modes**


g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.146	2.252	2.195
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.761	4.853
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 14.5  
Level Of Service: B  
Volume to Capacity (v/c): 0.459**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	57	1021	82	78	957	46	66	124	71	46	56	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	57	1021	82	78	957	46	66	124	71	46	56	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	255	21	20	239	12	17	31	18	12	14	9
Total Analysis Volume [veh/h]	57	1021	82	78	957	46	66	124	71	46	56	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	12	59	0	11	30	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	85	76	76	85	76	76	17	8	8	17	8	8
g / C, Green / Cycle	0.77	0.69	0.69	0.77	0.69	0.69	0.15	0.08	0.08	0.15	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.03	0.30	0.29	0.04	0.27	0.27	0.04	0.05	0.05	0.03	0.03	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1257	1302	1234	1221	1311	1242	339	146	138	286	134	127
d1, Uniform Delay [s]	2.95	7.80	7.72	2.99	7.28	7.24	40.79	49.63	49.46	40.32	48.77	48.73
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	1.08	1.09	0.02	0.90	0.92	0.28	6.18	5.42	0.26	1.58	1.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.44	0.43	0.06	0.40	0.39	0.19	0.71	0.67	0.16	0.35	0.34
d, Delay for Lane Group [s/veh]	3.02	8.89	8.81	3.01	8.18	8.16	41.07	55.81	54.88	40.58	50.36	50.31
Lane Group LOS	A	A	A	A	A	A	D	E	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.26	5.89	5.40	0.34	5.01	4.66	1.60	3.01	2.66	1.10	1.30	1.19
50th-Percentile Queue Length [ft/ln]	6.56	147.33	134.92	8.45	125.30	116.45	39.99	75.36	66.55	27.62	32.62	29.81
95th-Percentile Queue Length [veh/ln]	0.47	9.87	9.21	0.61	8.68	8.20	2.88	5.43	4.79	1.99	2.35	2.15
95th-Percentile Queue Length [ft/ln]	11.82	246.86	230.17	15.22	217.09	204.93	71.98	135.65	119.80	49.72	58.71	53.67

**Movement, Approach, & Intersection Results**

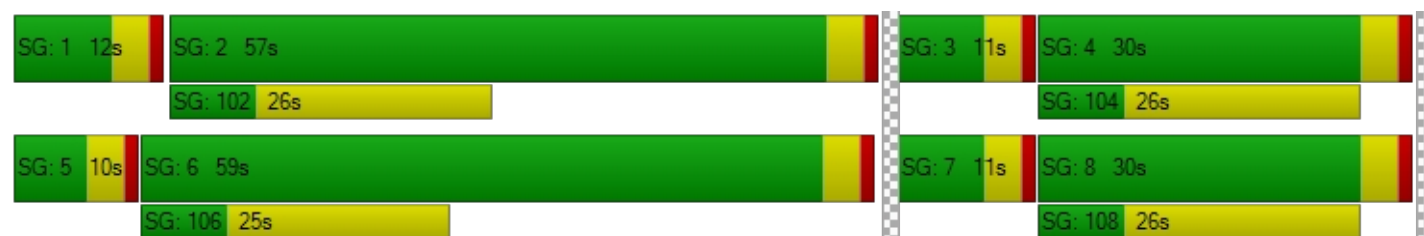
d_M, Delay for Movement [s/veh]	3.02	8.85	8.81	3.01	8.17	8.16	41.07	55.65	54.88	40.58	50.35	50.31
Movement LOS	A	A	A	A	A	A	D	E	D	D	D	D
d_A, Approach Delay [s/veh]	8.56			7.80			51.75			47.06		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	14.52											
Intersection LOS	B											
Intersection V/C	0.459											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.751			2.747			2.449			2.470		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			1000			473			473		
d_b, Bicycle Delay [s]	14.77			13.75			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.517			2.451			1.775			1.673		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.766

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	928	251	122	777	157	164	631	118	207	528	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	928	251	122	777	157	164	631	118	207	528	122
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	232	63	31	194	39	41	158	30	52	132	31
Total Analysis Volume [veh/h]	116	928	251	122	777	157	164	631	118	207	528	122
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	13	59	0	10	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	66	56	56	66	56	56	36	26	26	36	23	23
g / C, Green / Cycle	0.60	0.51	0.51	0.60	0.51	0.51	0.33	0.24	0.24	0.33	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.06	0.33	0.31	0.07	0.26	0.24	0.09	0.21	0.20	0.12	0.14	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	843	961	911	717	962	911	469	455	431	337	806	382
d1, Uniform Delay [s]	9.59	20.03	19.40	9.62	18.13	17.77	27.11	40.23	39.65	27.84	39.68	36.65
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.34	3.42	3.01	0.11	1.96	1.83	0.45	5.23	3.95	1.82	0.91	0.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.65	0.61	0.17	0.51	0.48	0.35	0.87	0.82	0.61	0.65	0.32
d, Delay for Lane Group [s/veh]	9.93	23.45	22.41	9.73	20.09	19.60	27.56	45.46	43.60	29.67	40.59	37.12
Lane Group LOS	A	C	C	A	C	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.25	12.28	10.50	1.26	8.65	7.56	3.23	10.83	9.44	4.28	6.60	2.83
50th-Percentile Queue Length [ft/ln]	31.24	307.04	262.43	31.43	216.19	189.04	80.79	270.79	236.11	107.11	165.11	70.66
95th-Percentile Queue Length [veh/ln]	2.25	18.03	15.81	2.26	13.47	12.07	5.82	16.23	14.48	7.68	10.82	5.09
95th-Percentile Queue Length [ft/ln]	56.23	450.72	395.27	56.57	336.76	301.79	145.42	405.73	362.12	191.97	270.48	127.18

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	9.93	23.11	22.41	9.73	19.91	19.60	27.56	44.76	43.60	29.67	40.59	37.12
Movement LOS	A	C	C	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	21.79			18.69			41.52			37.46		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	28.63											
Intersection LOS	C											
Intersection V/C	0.766											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.853			2.806			2.730			2.856		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			945		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.628			2.431			2.313			2.267		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	118	401	223	45	401	112	296	646	118	149	614	113
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	401	223	45	401	112	296	646	118	149	614	113
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	100	56	11	100	28	74	162	30	37	154	28
Total Analysis Volume [veh/h]	118	401	223	45	401	112	296	646	118	149	614	113
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	41	58	0	10	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	48	48	57	47	47	20	35	35	6	21	21
g / C, Green / Cycle	0.52	0.44	0.44	0.52	0.43	0.43	0.18	0.32	0.32	0.05	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.12	0.03	0.14	0.13	0.16	0.21	0.20	0.04	0.16	0.06
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	843	1661	787	896	807	765	333	609	577	194	725	343
d1, Uniform Delay [s]	13.84	19.50	19.90	13.27	21.24	21.02	43.76	32.27	31.80	51.31	43.01	38.47
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	0.34	0.90	0.02	1.13	1.08	8.03	1.24	1.12	6.31	2.86	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.24	0.28	0.05	0.34	0.32	0.89	0.66	0.63	0.77	0.85	0.33
d, Delay for Lane Group [s/veh]	14.19	19.84	20.81	13.29	22.37	22.10	51.79	33.51	32.93	57.62	45.86	39.03
Lane Group LOS	B	B	C	B	C	C	D	C	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.59	3.28	3.83	0.56	4.90	4.32	8.55	9.36	8.26	2.19	8.29	2.69
50th-Percentile Queue Length [ft/ln]	39.66	82.07	95.87	13.89	122.57	107.88	213.74	234.03	206.57	54.83	207.34	67.23
95th-Percentile Queue Length [veh/ln]	2.86	5.91	6.90	1.00	8.53	7.72	13.34	14.38	12.98	3.95	13.02	4.84
95th-Percentile Queue Length [ft/ln]	71.39	147.73	172.56	25.01	213.35	193.06	333.62	359.48	324.42	98.70	325.42	121.01

**Movement, Approach, & Intersection Results**

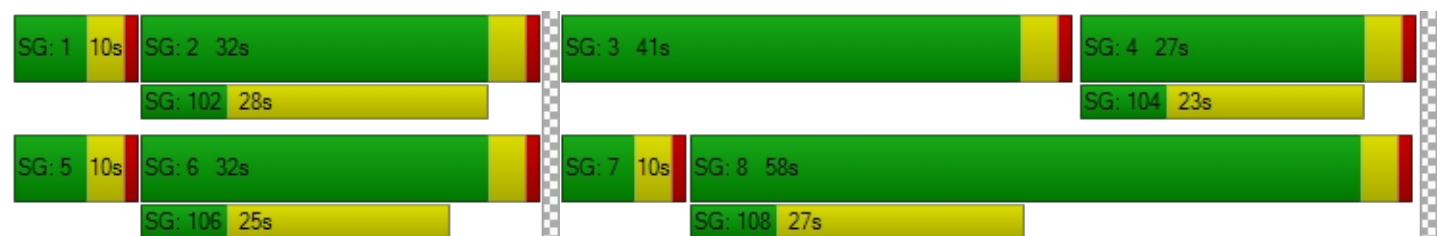
d_M, Delay for Movement [s/veh]	14.19	19.84	20.81	13.29	22.28	22.10	51.79	33.29	32.93	57.62	45.86	39.03
Movement LOS	B	B	C	B	C	C	D	C	C	E	D	D
d_A, Approach Delay [s/veh]	19.23			21.52			38.41			46.98		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	33.42											
Intersection LOS	C											
Intersection V/C	0.591											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.692			2.576			2.755			2.882		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			418		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			34.40		
I_b,int, Bicycle LOS Score for Intersection	2.172			2.020			2.434			2.282		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 13.4  
Level Of Service: B  
Volume to Capacity (v/c): 0.475**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	22	13	256	19	92	269	662	7	7	796	609
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	22	13	256	19	92	269	662	7	7	796	609
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	3	64	5	23	67	166	2	2	199	152
Total Analysis Volume [veh/h]	12	22	13	256	19	92	269	662	7	7	796	609
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	18	26	76	76	76	63	63	85
g / C, Green / Cycle	0.04	0.04	0.04	0.16	0.24	0.69	0.69	0.69	0.57	0.57	0.77
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.07	0.06	0.15	0.18	0.18	0.00	0.21	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	79	75	569	433	1123	1305	1236	930	2169	1386
d1, Uniform Delay [s]	50.86	51.11	50.89	41.61	33.80	6.35	6.60	6.59	10.18	12.82	4.41
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.33	1.89	1.09	0.56	0.31	0.11	0.49	0.52	0.01	0.48	0.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.28	0.17	0.45	0.26	0.24	0.26	0.26	0.01	0.37	0.44
d, Delay for Lane Group [s/veh]	52.19	53.00	51.98	42.16	34.11	6.46	7.09	7.11	10.19	13.30	4.89
Lane Group LOS	D	D	D	D	C	A	A	A	B	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.34	0.63	0.37	3.18	2.44	2.15	2.98	2.82	0.08	5.28	4.00
50th-Percentile Queue Length [ft/ln]	8.58	15.73	9.21	79.53	61.07	53.63	74.61	70.59	1.89	132.11	99.97
95th-Percentile Queue Length [veh/ln]	0.62	1.13	0.66	5.73	4.40	3.86	5.37	5.08	0.14	9.05	7.20
95th-Percentile Queue Length [ft/ln]	15.44	28.31	16.58	143.16	109.92	96.53	134.30	127.06	3.40	226.37	179.94

**Movement, Approach, & Intersection Results**

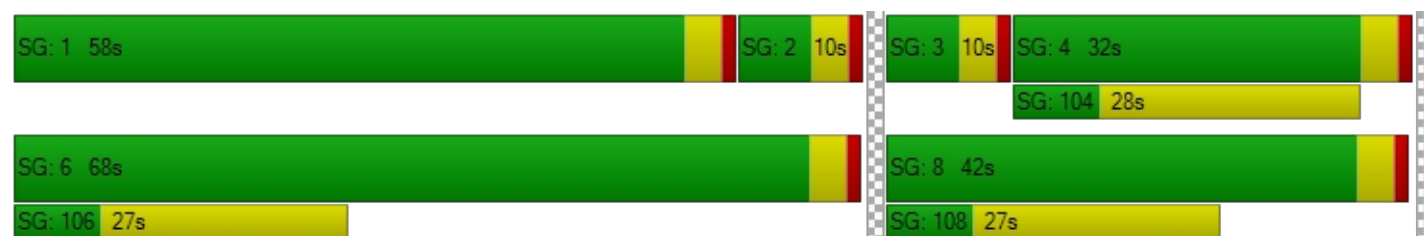
d_M, Delay for Movement [s/veh]	52.19	53.00	51.98	42.16	34.11	34.11	6.46	7.10	7.11	10.19	13.30	4.89
Movement LOS	D	D	D	D	C	C	A	A	A	B	B	A
d_A, Approach Delay [s/veh]	52.51			39.73			6.91			9.66		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	13.45											
Intersection LOS	B											
Intersection V/C	0.475											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.170			2.675			2.685			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.637			2.165			2.333			2.725		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	194	107	94	118	172	71	52	772	92	95	1211	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	194	107	94	118	172	71	52	772	92	95	1211	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	27	24	30	43	18	13	193	23	24	303	13
Total Analysis Volume [veh/h]	194	107	94	118	172	71	52	772	92	95	1211	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	31	0	22	35	0	10	47	0	10	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	26	14	14	26	10	10	76	66	66	76	67	67
g / C, Green / Cycle	0.24	0.13	0.13	0.24	0.09	0.09	0.69	0.60	0.60	0.69	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.11	0.06	0.05	0.07	0.07	0.06	0.03	0.24	0.23	0.05	0.34	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	415	250	237	439	175	166	948	1139	1079	1098	1154	1093
d1, Uniform Delay [s]	35.70	44.01	43.82	34.09	48.67	48.46	5.52	11.59	11.45	5.66	12.91	12.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	1.16	1.08	0.33	5.88	5.03	0.02	1.04	1.03	0.16	2.00	2.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.43	0.40	0.27	0.74	0.69	0.05	0.40	0.38	0.09	0.56	0.56
d, Delay for Lane Group [s/veh]	36.52	45.18	44.90	34.42	54.56	53.49	5.54	12.62	12.48	5.81	14.92	14.88
Lane Group LOS	D	D	D	C	D	D	A	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.53	2.76	2.42	2.61	3.72	3.27	0.36	5.87	5.30	0.71	9.66	9.01
50th-Percentile Queue Length [ft/ln]	113.16	69.12	60.47	65.34	93.00	81.73	9.05	146.63	132.42	17.83	241.62	225.33
95th-Percentile Queue Length [veh/ln]	8.02	4.98	4.35	4.70	6.70	5.88	0.65	9.84	9.07	1.28	14.76	13.94
95th-Percentile Queue Length [ft/ln]	200.39	124.42	108.85	117.62	167.40	147.11	16.28	245.93	226.78	32.10	369.08	348.41

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	36.52	45.18	44.90	34.42	54.29	53.49	5.54	12.56	12.48	5.81	14.90	14.88
Movement LOS	D	D	D	C	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	40.86			47.64			12.16			14.26		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	21.07											
Intersection LOS	C											
Intersection V/C	0.606											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.540			2.326			2.806			2.791		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			564			782			782		
d_b, Bicycle Delay [s]	31.31			28.37			20.40			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.211			1.857			2.315			2.679		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.439

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	38	40	50	29	22	33	26	868	41	48	1271	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	40	50	29	22	33	26	868	41	48	1271	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	10	13	7	6	8	7	217	10	12	318	12
Total Analysis Volume [veh/h]	38	40	50	29	22	33	26	868	41	48	1271	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	67	0	11	68	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	87	87	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.87	0.80	0.80	0.87	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.03	0.02	0.03	0.01	0.25	0.24	0.03	0.36	0.35
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	80	102	97	96	97	1462	1510	1430	1537	1533	1452
d1, Uniform Delay [s]	50.29	50.28	50.63	50.03	50.78	0.89	3.08	3.07	0.91	3.20	3.18
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.38	2.41	4.19	1.72	5.12	0.00	0.54	0.56	0.04	0.93	0.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.39	0.52	0.30	0.57	0.02	0.31	0.31	0.03	0.44	0.44
d, Delay for Lane Group [s/veh]	54.67	52.70	54.82	51.76	55.89	0.90	3.62	3.62	0.94	4.14	4.15
Lane Group LOS	D	D	D	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.11	1.13	1.45	0.81	1.61	0.03	2.34	2.18	0.06	3.59	3.36
50th-Percentile Queue Length [ft/ln]	27.68	28.31	36.29	20.34	40.37	0.69	58.45	54.47	1.61	89.68	84.04
95th-Percentile Queue Length [veh/ln]	1.99	2.04	2.61	1.46	2.91	0.05	4.21	3.92	0.12	6.46	6.05
95th-Percentile Queue Length [ft/ln]	49.83	50.95	65.31	36.60	72.66	1.25	105.22	98.05	2.89	161.43	151.27

**Movement, Approach, & Intersection Results**

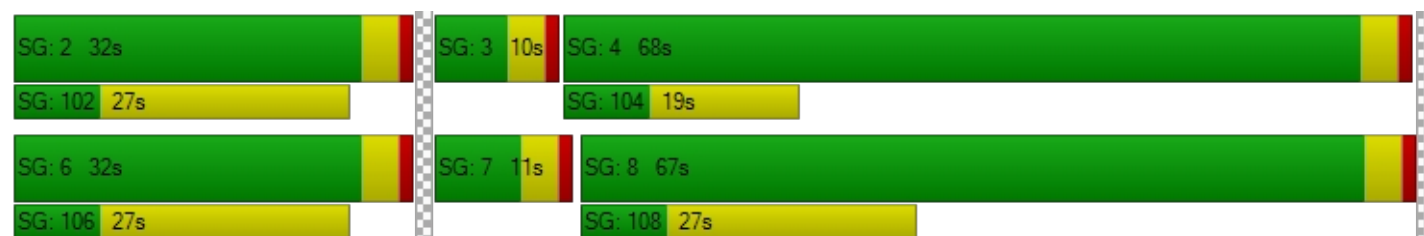
d_M, Delay for Movement [s/veh]	54.67	52.70	54.82	51.76	55.89	55.89	0.90	3.62	3.62	0.94	4.14	4.15
Movement LOS	D	D	D	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.11			54.47			3.55			4.03		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.09											
Intersection LOS	A											
Intersection V/C	0.439											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.254			2.044			2.807			2.802		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			1145			1164		
d_b, Bicycle Delay [s]	30.56			30.56			10.04			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.771			1.698			2.331			2.687		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	133	254	85	146	295	272	235	722	75	136	953	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	254	85	146	295	272	235	722	75	136	953	128
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	64	21	37	74	68	59	181	19	34	238	32
Total Analysis Volume [veh/h]	133	254	85	146	295	272	235	722	75	136	953	128
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	13	47	0	14	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	47	47	7	46	59	9	30	30	10	31	31
g / C, Green / Cycle	0.07	0.43	0.43	0.06	0.41	0.53	0.08	0.28	0.28	0.09	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.05	0.04	0.08	0.15	0.07	0.19	0.04	0.08	0.25	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	132	1620	767	211	1571	958	289	1050	497	165	1084	514
d1, Uniform Delay [s]	51.01	19.41	19.01	50.72	20.54	14.19	49.68	35.59	30.08	49.15	37.52	30.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.12	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	37.89	0.21	0.29	3.99	0.26	0.18	5.53	0.81	0.14	9.91	2.49	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.16	0.11	0.69	0.19	0.28	0.81	0.69	0.15	0.83	0.88	0.25
d, Delay for Lane Group [s/veh]	88.90	19.62	19.30	54.70	20.80	14.38	55.21	36.40	30.22	59.06	40.01	30.52
Lane Group LOS	F	B	B	D	C	B	E	D	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.02	2.04	1.37	2.09	2.46	3.70	3.39	8.69	1.53	4.12	12.44	2.65
50th-Percentile Queue Length [ft/ln]	125.57	50.92	34.18	52.16	61.51	92.57	84.81	217.36	38.13	102.91	310.92	66.23
95th-Percentile Queue Length [veh/ln]	8.72	3.67	2.46	3.76	4.43	6.66	6.11	13.53	2.75	7.41	18.22	4.77
95th-Percentile Queue Length [ft/ln]	217.89	91.66	61.52	93.89	110.72	166.62	152.67	338.26	68.63	185.23	455.52	119.22

**Movement, Approach, & Intersection Results**

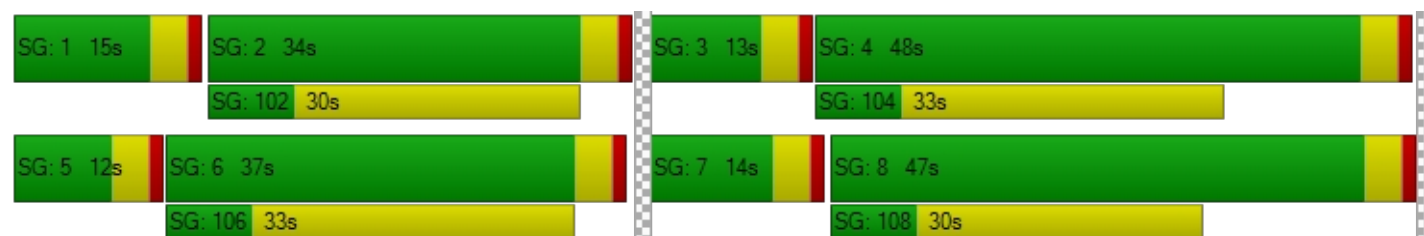
d_M, Delay for Movement [s/veh]	88.90	19.62	19.30	54.70	20.80	14.38	55.21	36.40	30.22	59.06	40.01	30.52
Movement LOS	F	B	B	D	C	B	E	D	C	E	D	C
d_A, Approach Delay [s/veh]	39.08			25.29			40.23			41.14		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	37.30											
Intersection LOS	D											
Intersection V/C	0.618											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.621			2.789			2.936			2.815		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			800		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			19.80		
I_b,int, Bicycle LOS Score for Intersection	1.949			2.148			2.411			2.564		
Bicycle LOS	A			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	60	0	176	119	98	316	0
Total Analysis Volume [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	20	0	0	34	0	56	90	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		16	16	56	56	26	86
g / C, Green / Cycle		0.15	0.15	0.51	0.51	0.24	0.78
(v / s)_i Volume / Saturation Flow Rate		0.05	0.13	0.18	0.26	0.22	0.33
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		262	262	1927	913	429	2970
d1, Uniform Delay [s]		42.30	46.28	16.39	18.17	40.77	3.93
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.80	11.79	0.53	2.13	7.85	0.45
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.35	0.91	0.36	0.52	0.91	0.43
d, Delay for Lane Group [s/veh]		43.10	58.08	16.92	20.29	48.63	4.38
Lane Group LOS		D	E	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.31	7.26	5.38	8.42	11.12	3.77
50th-Percentile Queue Length [ft/ln]		57.74	181.47	134.62	210.45	278.01	94.24
95th-Percentile Queue Length [veh/ln]		4.16	11.68	9.19	13.18	16.59	6.79
95th-Percentile Queue Length [ft/ln]		103.94	291.93	229.76	329.41	414.73	169.63

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	43.10	43.10	58.08	0.00	16.92	20.29	48.63	4.38	0.00
Movement LOS				D	D	E		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			53.91			18.29			14.83		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	20.21											
Intersection LOS	C											
Intersection V/C	0.690											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.278	1.886	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	291	545	1564
d_b, Bicycle Delay [s]	55.00	40.16	29.09	2.62
I_b,int, Bicycle LOS Score for Intersection	4.132	2.106	2.208	2.925
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	154	0	98	0	0	0	53	160	0	0	243	36
Total Analysis Volume [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	59	0	0	0	0	0	32	51	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		15	78	59	59
g / C, Green / Cycle	0.22	0.22	0.22		0.14	0.71	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.12	0.17	0.29	0.31
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	399	399	399		246	2681	1012	959
d1, Uniform Delay [s]	40.94	40.94	40.94		46.41	5.73	16.99	17.39
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.83	4.83	4.83		8.25	0.21	2.15	2.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.84	0.84		0.85	0.24	0.55	0.58
d, Delay for Lane Group [s/veh]	45.77	45.77	45.77		54.66	5.94	19.15	19.96
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.15	9.15	9.15		6.15	2.42	9.59	9.88
50th-Percentile Queue Length [ft/ln]	228.87	228.87	228.87		153.74	60.56	239.65	246.91
95th-Percentile Queue Length [veh/ln]	14.12	14.12	14.12		10.22	4.36	14.66	15.03
95th-Percentile Queue Length [ft/ln]	352.92	352.92	352.92		255.41	109.00	366.60	375.75

**Movement, Approach, & Intersection Results**

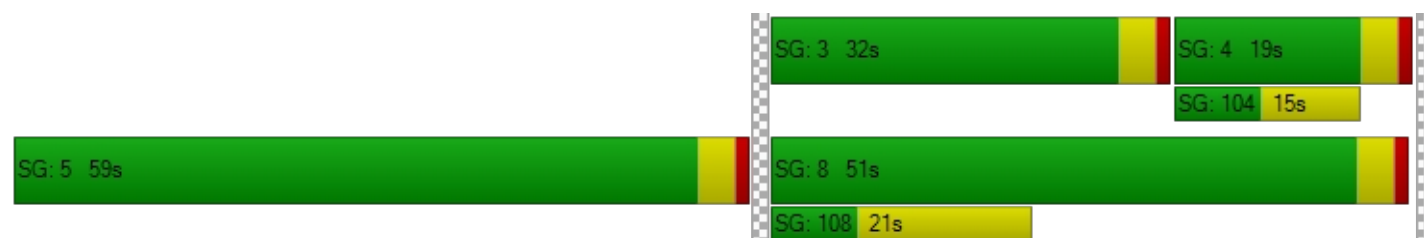
d_M, Delay for Movement [s/veh]	45.77	0.00	45.77	0.00	0.00	0.00	54.66	5.94	0.00	0.00	19.50	19.96
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	45.77			0.00			18.01			19.56		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	28.00											
Intersection LOS	C											
Intersection V/C	0.688											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.277	1.776	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	855	273
d_b, Bicycle Delay [s]	55.00	55.00	18.04	41.02
I_b,int, Bicycle LOS Score for Intersection	5.794	4.132	2.259	2.479
Bicycle LOS	F	D	B	B

**Sequence**


Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.289

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	31	802	28	11	686	18	13	19	32	32	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	802	28	11	686	18	13	19	32	32	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	201	7	3	172	5	3	5	8	8	4	7
Total Analysis Volume [veh/h]	31	802	28	11	686	18	13	19	32	32	17	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	96	96	96	96	96	96	6	6
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.23	0.22	0.01	0.19	0.19	0.04	0.04
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1528	1656	1569	1515	1656	1569	139	146
d1, Uniform Delay [s]	0.92	1.17	1.16	0.91	1.12	1.11	50.80	51.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.38	0.39	0.01	0.30	0.32	2.35	2.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.26	0.26	0.01	0.22	0.22	0.46	0.52
d, Delay for Lane Group [s/veh]	0.94	1.55	1.56	0.92	1.42	1.43	53.16	53.99
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.04	0.74	0.70	0.02	0.60	0.57	1.81	2.18
50th-Percentile Queue Length [ft/ln]	1.07	18.55	17.53	0.38	15.01	14.25	45.35	54.38
95th-Percentile Queue Length [veh/ln]	0.08	1.34	1.26	0.03	1.08	1.03	3.26	3.92
95th-Percentile Queue Length [ft/ln]	1.92	33.40	31.55	0.68	27.02	25.65	81.62	97.88

**Movement, Approach, & Intersection Results**

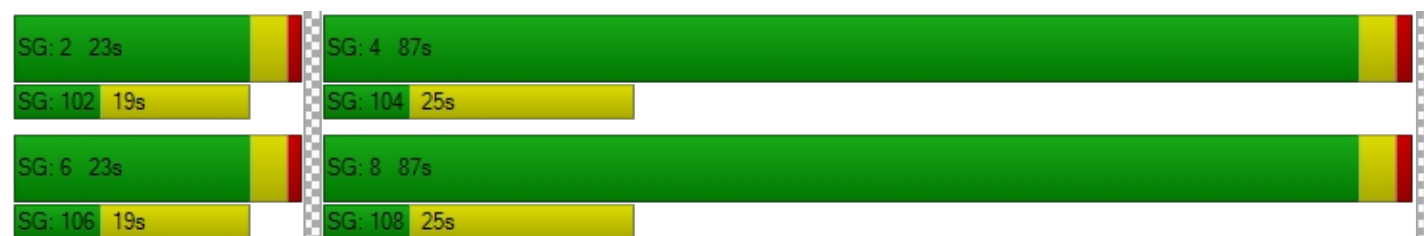
d_M, Delay for Movement [s/veh]	0.94	1.55	1.56	0.92	1.43	1.43	53.16	53.16	53.16	53.99	53.99	53.99
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.53			1.42			53.16			53.99		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.73											
Intersection LOS	A											
Intersection V/C	0.289											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.669			2.632			1.832			1.805		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.270			2.149			1.665			1.685		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	77	1166	108	106	893	182	185	427	85	127	435	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1166	108	106	893	182	185	427	85	127	435	196
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	292	27	27	223	46	46	107	21	32	109	49
Total Analysis Volume [veh/h]	77	1166	108	106	893	182	185	427	85	127	435	196
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	48	38	38	48	39	39	54	43	43	54	41	41
g / C, Green / Cycle	0.44	0.35	0.35	0.44	0.35	0.35	0.49	0.39	0.39	0.49	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.04	0.31	0.06	0.06	0.30	0.28	0.10	0.11	0.05	0.07	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	388	1327	629	366	670	634	827	1495	708	834	1413	669
d1, Uniform Delay [s]	18.10	33.62	24.79	18.41	32.93	32.15	16.06	22.82	21.26	15.51	24.53	24.38
k, delay calibration	0.11	0.11	0.11	0.11	0.18	0.16	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	2.04	0.13	0.43	5.08	3.39	0.14	0.48	0.35	0.39	0.57	1.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.20	0.88	0.17	0.29	0.85	0.80	0.22	0.29	0.12	0.15	0.31	0.29
d, Delay for Lane Group [s/veh]	18.35	35.66	24.92	18.84	38.01	35.54	16.20	23.31	21.61	15.89	25.10	25.49
Lane Group LOS	B	D	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.18	14.68	1.98	1.65	14.64	12.55	2.66	3.86	1.46	1.83	4.11	3.79
50th-Percentile Queue Length [ft/ln]	29.39	367.08	49.42	41.32	366.07	313.64	66.45	96.48	36.56	45.77	102.81	94.74
95th-Percentile Queue Length [veh/ln]	2.12	20.97	3.56	2.97	20.92	18.35	4.78	6.95	2.63	3.30	7.40	6.82
95th-Percentile Queue Length [ft/ln]	52.91	524.19	88.96	74.37	522.97	458.86	119.61	173.66	65.81	82.38	185.05	170.53

**Movement, Approach, & Intersection Results**

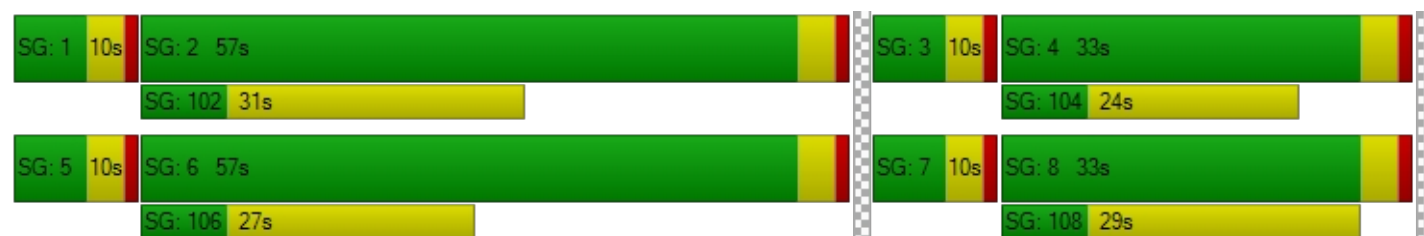
d_M, Delay for Movement [s/veh]	18.35	35.66	24.92	18.84	37.11	35.54	16.20	23.31	21.61	15.89	25.10	25.49
Movement LOS	B	D	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.82			35.23			21.21			23.66		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.10											
Intersection LOS	C											
Intersection V/C	0.610											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.936			2.944			2.729			2.745		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			527		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.674			2.534			2.135			2.185		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	127	740	193	45	678	72	83	492	122	238	495	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	740	193	45	678	72	83	492	122	238	495	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	185	48	11	170	18	21	123	31	60	124	10
Total Analysis Volume [veh/h]	127	740	193	45	678	72	83	492	122	238	495	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	25	48	0	22	45	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	29	29	37	26	26	7	51	51	10	54	54
g / C, Green / Cycle	0.34	0.26	0.26	0.34	0.23	0.23	0.06	0.46	0.46	0.09	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.07	0.19	0.11	0.03	0.21	0.20	0.05	0.13	0.07	0.07	0.13	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	356	997	472	391	446	423	109	1747	827	318	1861	882
d1, Uniform Delay [s]	25.76	37.19	33.55	24.56	40.59	40.24	50.91	18.46	17.24	48.82	16.48	14.65
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	1.11	0.57	0.13	5.64	4.79	10.24	0.40	0.38	3.53	0.35	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.74	0.41	0.12	0.88	0.85	0.76	0.28	0.15	0.75	0.27	0.04
d, Delay for Lane Group [s/veh]	26.37	38.30	34.11	24.69	46.22	45.03	61.15	18.87	17.62	52.35	16.83	14.74
Lane Group LOS	C	D	C	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.42	9.19	4.33	0.81	10.81	9.75	2.56	3.94	1.87	3.34	3.70	0.53
50th-Percentile Queue Length [ft/ln]	60.57	229.76	108.15	20.31	270.30	243.69	63.99	98.59	46.68	83.43	92.50	13.22
95th-Percentile Queue Length [veh/ln]	4.36	14.16	7.74	1.46	16.20	14.87	4.61	7.10	3.36	6.01	6.66	0.95
95th-Percentile Queue Length [ft/ln]	109.03	354.05	193.42	36.55	405.11	371.69	115.18	177.46	84.03	150.18	166.51	23.80

**Movement, Approach, & Intersection Results**

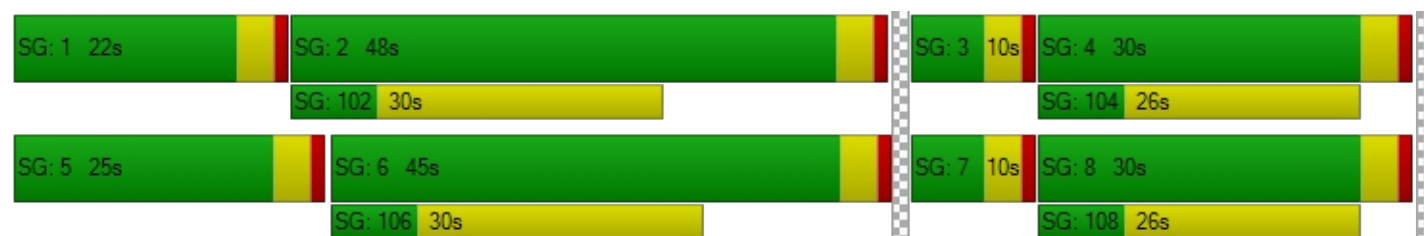
d_M, Delay for Movement [s/veh]	26.37	38.30	34.11	24.69	45.72	45.03	61.15	18.87	17.62	52.35	16.83	14.74
Movement LOS	C	D	C	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	36.11			44.47			23.68			27.67		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.54											
Intersection LOS	C											
Intersection V/C	0.534											

**Other Modes**





g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.803			2.633			2.734			2.831		
Crosswalk LOS	C			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			745			473			473		
d_b, Bicycle Delay [s]	19.80			21.64			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.434			2.215			2.135			2.197		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):11.5  
B  
0.551**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	55	1255	33	38	1377	38	62	79	87	70	109	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	1255	33	38	1377	38	62	79	87	70	109	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	314	8	10	344	10	16	20	22	18	27	8
Total Analysis Volume [veh/h]	55	1255	33	38	1377	38	62	79	87	70	109	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.35	0.35	0.02	0.38	0.38	0.13	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1180	1487	1408	1214	1487	1408	302	76	260
d1, Uniform Delay [s]	2.68	3.99	3.98	2.65	4.21	4.20	45.94	41.74	43.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.97	1.01	0.05	1.16	1.21	3.82	30.68	1.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.45	0.44	0.03	0.49	0.49	0.75	0.92	0.55
d, Delay for Lane Group [s/veh]	2.75	4.97	4.99	2.70	5.37	5.40	49.76	72.42	45.33
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.24	4.24	3.99	0.16	4.93	4.64	6.38	2.34	3.70
50th-Percentile Queue Length [ft/ln]	5.95	106.11	99.81	4.06	123.36	116.08	159.44	58.52	92.62
95th-Percentile Queue Length [veh/ln]	0.43	7.62	7.19	0.29	8.58	8.18	10.52	4.21	6.67
95th-Percentile Queue Length [ft/ln]	10.71	190.58	179.66	7.30	214.44	204.42	262.98	105.33	166.72

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	2.75	4.98	4.99	2.70	5.39	5.40	49.76	49.76	49.76	72.42	45.33	45.33
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.89			5.32			49.76			54.27		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.48											
Intersection LOS	B											
Intersection V/C	0.551											

**Other Modes**


g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.970			2.944			2.012			2.121		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1291			1291			564			564		
d_b, Bicycle Delay [s]	6.91			6.91			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.668			2.758			1.936			1.909		
Bicycle LOS	B			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 10.0  
Level Of Service: B  
Volume to Capacity (v/c): 0.438**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	94	1030	61	49	955	44	51	38	79	120	35	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	1030	61	49	955	44	51	38	79	120	35	41
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	258	15	12	239	11	13	10	20	30	9	10
Total Analysis Volume [veh/h]	94	1030	61	49	955	44	51	38	79	120	35	41
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.05	0.30	0.29	0.03	0.27	0.27	0.09	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1326	1520	1440	1308	1520	1440	272	282
d1, Uniform Delay [s]	2.32	3.13	3.10	2.26	3.02	3.00	46.15	46.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.70	0.72	0.05	0.61	0.63	2.29	3.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.37	0.36	0.04	0.34	0.33	0.62	0.70
d, Delay for Lane Group [s/veh]	2.42	3.83	3.82	2.31	3.63	3.63	48.44	50.05
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.36	2.89	2.68	0.18	2.55	2.38	4.58	5.47
50th-Percentile Queue Length [ft/ln]	8.95	72.33	67.03	4.55	63.71	59.38	114.39	136.70
95th-Percentile Queue Length [veh/ln]	0.64	5.21	4.83	0.33	4.59	4.28	8.08	9.30
95th-Percentile Queue Length [ft/ln]	16.12	130.20	120.65	8.19	114.69	106.88	202.09	232.57

**Movement, Approach, & Intersection Results**

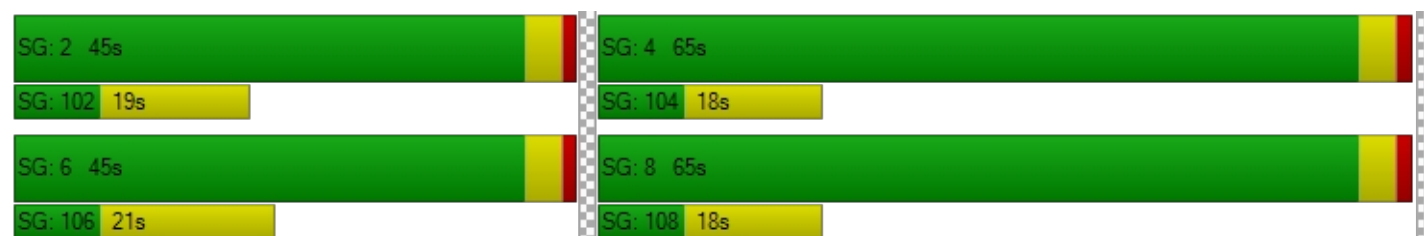
d_M, Delay for Movement [s/veh]	2.42	3.82	3.82	2.31	3.63	3.63	48.44	48.44	48.44	50.05	50.05	50.05
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.71			3.56			48.44			50.05		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.04											
Intersection LOS	B											
Intersection V/C	0.438											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.936			2.805			2.024			1.962		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.537			2.424			1.837			1.883		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	200	1242	256	256	1197	203	248	734	307	244	815	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	1242	256	256	1197	203	248	734	307	244	815	217
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	311	64	64	299	51	62	184	77	61	204	54
Total Analysis Volume [veh/h]	200	1242	256	256	1197	203	248	734	307	244	815	217
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	40	0	12	41	0	21	39	0	19	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	36	36	8	37	37	17	35	35	15	33	33
g / C, Green / Cycle	0.06	0.33	0.33	0.07	0.34	0.34	0.15	0.32	0.32	0.14	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.33	0.14	0.07	0.30	0.14	0.14	0.13	0.17	0.14	0.14	0.12
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1243	589	255	1277	605	276	1807	571	248	1717	542
d1, Uniform Delay [s]	51.14	37.01	29.04	51.00	34.75	28.17	45.71	29.45	30.93	47.30	31.33	30.53
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.13	11.75	0.51	27.57	2.59	0.45	10.10	0.68	3.61	22.92	0.94	2.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	1.00	0.43	1.01	0.90	0.41	0.90	0.41	0.54	0.98	0.47	0.40
d, Delay for Lane Group [s/veh]	63.28	48.75	29.55	78.57	37.34	28.62	55.81	30.13	34.55	70.22	32.28	32.73
Lane Group LOS	E	D	C	F	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.10	18.33	5.36	4.47	14.79	5.14	7.39	5.16	7.22	8.21	6.00	4.89
50th-Percentile Queue Length [ft/ln]	77.60	458.34	133.96	111.71	369.77	128.62	184.64	129.01	180.60	205.16	150.11	122.20
95th-Percentile Queue Length [veh/ln]	5.59	25.36	9.15	7.95	21.10	8.86	11.84	8.89	11.63	12.90	10.02	8.51
95th-Percentile Queue Length [ft/ln]	139.68	633.89	228.86	198.73	527.45	221.62	296.06	222.15	290.80	322.61	250.57	212.84

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.28	48.75	29.55	78.57	36.99	28.62	55.81	30.13	34.55	70.22	32.28	32.73
Movement LOS	E	D	C	F	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	47.57			42.39			36.12			39.61		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	41.91											
Intersection LOS	D											
Intersection V/C	0.826											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.155			3.072			3.041			3.042		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			673			636			600		
d_b, Bicycle Delay [s]	24.89			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.960			2.470			2.269			2.261		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.796

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	292	1039	118	172	887	166	191	698	268	197	636	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	292	1039	118	172	887	166	191	698	268	197	636	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	260	30	43	222	42	48	175	67	49	159	42
Total Analysis Volume [veh/h]	292	1039	118	172	887	166	191	698	268	197	636	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	46	0	19	45	0	10	32	0	13	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	35	35	48	30	30	14	42	42	8	36	36
g / C, Green / Cycle	0.44	0.32	0.32	0.44	0.27	0.27	0.12	0.38	0.38	0.08	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.16	0.27	0.07	0.10	0.23	0.09	0.11	0.18	0.15	0.06	0.22	0.21
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	484	1217	577	421	1029	488	223	1433	679	271	628	595
d1, Uniform Delay [s]	20.87	35.00	27.21	19.33	38.18	32.24	47.26	26.17	25.10	49.65	31.83	31.18
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.21	1.81	0.17	0.64	2.27	0.41	9.06	1.19	1.72	3.70	5.87	5.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.85	0.20	0.41	0.86	0.34	0.86	0.49	0.39	0.73	0.68	0.63
d, Delay for Lane Group [s/veh]	22.08	36.81	27.39	19.97	40.46	32.65	56.31	27.35	26.81	53.35	37.70	36.20
Lane Group LOS	C	D	C	B	D	C	E	C	C	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.17	13.10	2.29	2.80	11.56	3.61	5.67	7.14	5.41	2.78	10.71	9.16
50th-Percentile Queue Length [ft/ln]	129.17	327.54	57.19	70.11	288.90	90.14	141.71	178.38	135.13	69.57	267.79	229.12
95th-Percentile Queue Length [veh/ln]	8.89	19.04	4.12	5.05	17.13	6.49	9.57	11.52	9.22	5.01	16.08	14.13
95th-Percentile Queue Length [ft/ln]	222.37	475.94	102.94	126.20	428.27	162.25	239.32	287.90	230.46	125.23	401.97	353.25

**Movement, Approach, & Intersection Results**

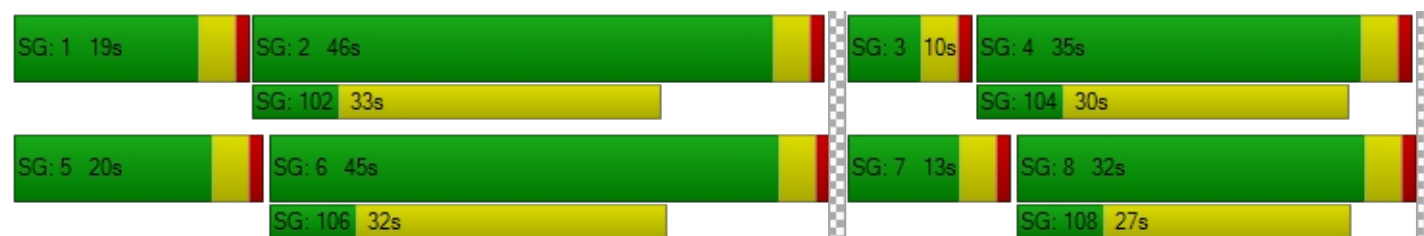
d_M, Delay for Movement [s/veh]	22.08	36.81	27.39	19.97	40.46	32.65	56.31	27.35	26.81	53.35	37.21	36.20
Movement LOS	C	D	C	B	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	33.08			36.52			32.01			40.22		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	35.17											
Intersection LOS	D											
Intersection V/C	0.796											

**Other Modes**




g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.918			2.888			2.948			2.963		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			745			509			564		
d_b, Bicycle Delay [s]	21.02			21.64			30.56			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.755			2.570			2.196			2.385		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):17.4  
B  
0.694**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	427	0	0	345	172	0	0	0	54	95	88
Total Analysis Volume [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	69	59	59		23	23	23
g / C, Green / Cycle	0.06	0.69	0.59	0.59		0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.03	0.30	0.36	0.38		0.12	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3922	2241	1062		417	881	417
d1, Uniform Delay [s]	45.81	6.94	13.19	13.62		33.50	32.76	36.70
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.35	1.27	3.07		0.99	0.33	4.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.44	0.61	0.65		0.52	0.43	0.85
d, Delay for Lane Group [s/veh]	48.11	7.30	14.46	16.69		34.49	33.09	41.47
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	4.82	9.57	10.37		4.62	3.91	8.66
50th-Percentile Queue Length [ft/ln]	35.31	120.57	239.15	259.35		115.49	97.83	216.42
95th-Percentile Queue Length [veh/ln]	2.54	8.42	14.64	15.66		8.14	7.04	13.48
95th-Percentile Queue Length [ft/ln]	63.56	210.61	365.96	391.40		203.62	176.10	337.05

**Movement, Approach, & Intersection Results**

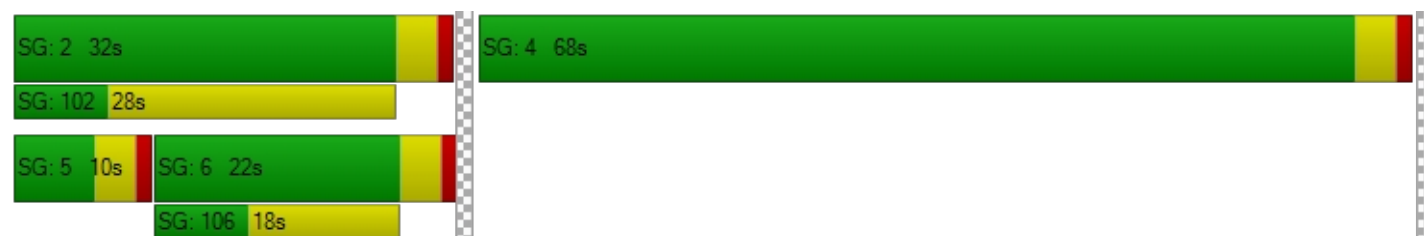
d_M, Delay for Movement [s/veh]	48.11	7.30	0.00	0.00	14.46	16.69	0.00	0.00	0.00	34.49	33.09	41.47
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	9.81			15.20			0.00			36.54		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.35											
Intersection LOS	B											
Intersection V/C	0.694											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.293			2.367		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.560			2.695			4.132			2.340		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.882

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	251	0	0	286	88	0	0	0	33	133	200
Total Analysis Volume [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	44	34	34		48	48	48
g / C, Green / Cycle	0.06	0.44	0.34	0.34		0.48	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.06	0.18	0.26	0.28		0.19	0.17	0.44
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2508	1289	610		864	912	864
d1, Uniform Delay [s]	46.72	19.02	29.61	30.21		16.63	16.34	24.30
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.25
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	24.46	0.48	4.57	11.54		0.29	0.24	9.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.92	0.40	0.77	0.82		0.39	0.36	0.92
d, Delay for Lane Group [s/veh]	71.18	19.50	34.18	41.74		16.91	16.58	34.14
Lane Group LOS	E	B	C	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.23	5.25	11.27	12.62		4.84	4.63	18.94
50th-Percentile Queue Length [ft/ln]	80.73	131.28	281.80	315.51		121.03	115.78	473.43
95th-Percentile Queue Length [veh/ln]	5.81	9.01	16.78	18.45		8.45	8.16	26.07
95th-Percentile Queue Length [ft/ln]	145.32	225.24	419.45	461.16		211.25	204.02	651.84

**Movement, Approach, & Intersection Results**

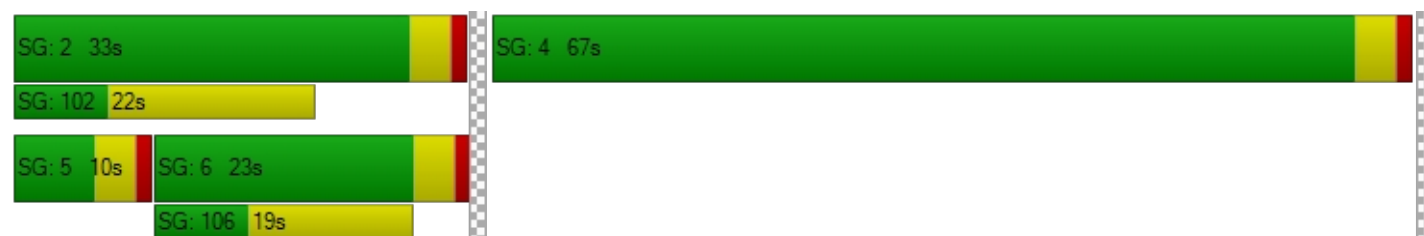
d_M, Delay for Movement [s/veh]	71.18	19.50	0.00	0.00	35.16	41.74	0.00	0.00	0.00	16.91	16.71	34.14
Movement LOS	E	B			D	D				B	B	C
d_A, Approach Delay [s/veh]	24.23			36.70			0.00			26.25		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	29.55											
Intersection LOS	C											
Intersection V/C	0.882											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.199	2.420
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	2.167	2.382	4.132	2.765
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	259	68	122	285	0	221	78	45	0	0	0
Total Analysis Volume [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	42	42	16	62	30	30	30	
g / C, Green / Cycle	0.42	0.42	0.16	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.25	0.16	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2392	755	576	3558	1035	562	532	
d1, Uniform Delay [s]	20.57	19.84	40.54	8.82	33.18	29.69	27.54	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.57	1.33	3.51	0.24	2.13	0.87	0.37	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.36	0.85	0.32	0.85	0.56	0.34	
d, Delay for Lane Group [s/veh]	21.15	21.18	44.04	9.06	35.31	30.56	27.91	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.70	4.52	6.03	3.66	10.17	6.39	3.37	
50th-Percentile Queue Length [ft/ln]	142.47	113.01	150.74	91.55	254.25	159.64	84.25	
95th-Percentile Queue Length [veh/ln]	9.61	8.01	10.06	6.59	15.40	10.53	6.07	
95th-Percentile Queue Length [ft/ln]	240.35	200.19	251.42	164.80	385.00	263.25	151.65	

**Movement, Approach, & Intersection Results**

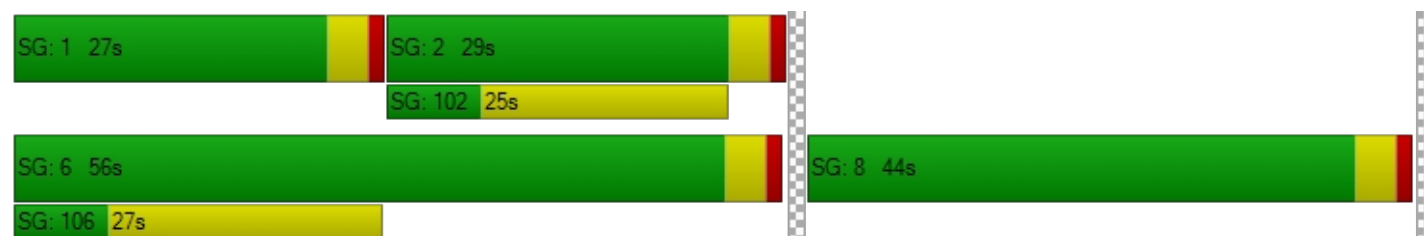
d_M, Delay for Movement [s/veh]	0.00	21.15	21.18	44.04	9.06	0.00	35.31	30.56	27.91	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	21.15			19.54			33.27			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	24.41											
Intersection LOS	C											
Intersection V/C	0.651											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.471			2.242		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.454			3.830			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	169	42	150	190	0	74	186	16	0	0	0
Total Analysis Volume [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	36	36	19	60	32	32	32	
g / C, Green / Cycle	0.36	0.36	0.19	0.60	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.17	0.20	0.29	0.27	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1378	653	673	2261	585	617	585	
d1, Uniform Delay [s]	23.84	24.08	39.36	10.24	32.15	31.31	23.60	
k, delay calibration	0.50	0.50	0.11	0.50	0.17	0.14	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.90	2.08	4.34	0.40	7.81	4.08	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.43	0.89	0.34	0.90	0.84	0.11	
d, Delay for Lane Group [s/veh]	24.74	26.15	43.70	10.64	39.96	35.39	23.68	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.07	5.32	7.48	4.09	12.99	11.98	1.03	
50th-Percentile Queue Length [ft/ln]	126.80	133.09	187.12	102.13	324.87	299.40	25.80	
95th-Percentile Queue Length [veh/ln]	8.77	9.11	11.97	7.35	18.91	17.65	1.86	
95th-Percentile Queue Length [ft/ln]	219.13	227.70	299.29	183.83	472.67	441.29	46.43	

**Movement, Approach, & Intersection Results**

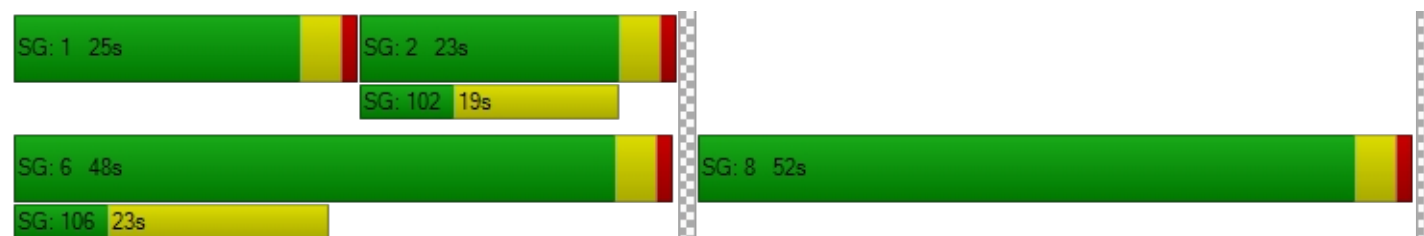
d_M, Delay for Movement [s/veh]	0.00	24.98	26.15	43.70	10.64	0.00	39.96	36.78	23.68	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	25.21			25.25			36.90			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.13											
Intersection LOS	C											
Intersection V/C	0.703											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.304			2.457		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.024			2.680			2.470			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.124

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	90	313	195	4	544
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	90	313	195	4	544
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	78	49	1	136
Total Analysis Volume [veh/h]	0	90	313	195	4	544
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	10.65	0.00	0.00	8.42	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.42	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	10.54	0.00	0.00	0.28	0.00
d_A, Approach Delay [s/veh]	10.65		0.00		0.06	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.87					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.397

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	840	45	17	425	0	30	0	62	190	0	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	840	45	17	425	0	30	0	62	190	0	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	210	11	4	106	0	8	0	16	48	0	11
Total Analysis Volume [veh/h]	0	840	45	17	425	0	30	0	62	190	0	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	56	0	10	66	0	0	44	0	44	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	82	82	88	88	14	14	14	14
g / C, Green / Cycle	0.74	0.74	0.80	0.80	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.23	0.25	0.01	0.11	0.02	0.03	0.11	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1412	1337	1376	3049	259	257	204	225
d1, Uniform Delay [s]	4.73	4.82	2.17	2.42	42.83	43.61	47.08	43.19
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.58	0.66	0.00	0.10	0.20	0.48	16.68	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.31	0.33	0.01	0.14	0.12	0.24	0.93	0.20
d, Delay for Lane Group [s/veh]	5.32	5.48	2.17	2.51	43.02	44.09	63.76	43.63
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.08	3.15	0.06	0.79	0.74	1.57	6.01	1.13
50th-Percentile Queue Length [ft/ln]	77.10	78.80	1.39	19.86	18.55	39.15	150.32	28.20
95th-Percentile Queue Length [veh/ln]	5.55	5.67	0.10	1.43	1.34	2.82	10.03	2.03
95th-Percentile Queue Length [ft/ln]	138.78	141.83	2.49	35.74	33.38	70.47	250.86	50.76

**Movement, Approach, & Intersection Results**

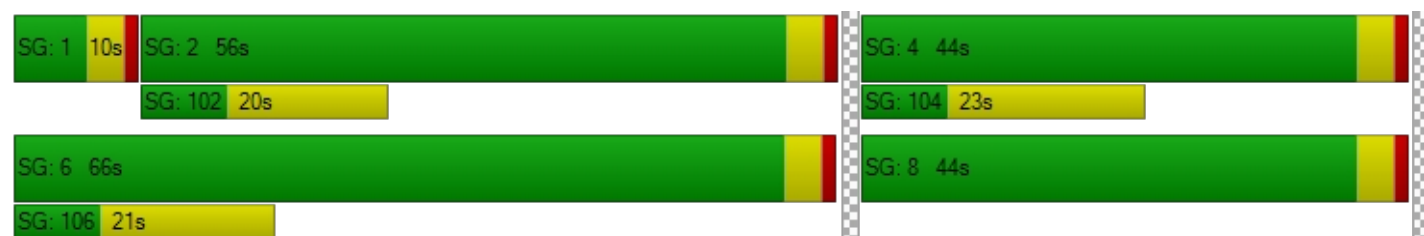
d_M, Delay for Movement [s/veh]	0.00	5.39	5.48	2.17	2.51	0.00	43.02	44.09	44.09	63.76	0.00	43.63
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	5.40			2.50			43.74			59.91		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.50											
Intersection LOS	B											
Intersection V/C	0.397											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.617			1.769			2.065		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			1127			727			0		
d_b, Bicycle Delay [s]	15.29			10.47			22.27			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.290			1.924			1.711			4.132		
Bicycle LOS	B			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	37.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.366

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	430	384	321	1	61	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	430	384	321	1	61	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	96	80	0	15	22
Total Analysis Volume [veh/h]	430	384	321	1	61	87
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.35	0.00	0.00	0.00	0.37	0.12
d_M, Delay for Movement [s/veh]	9.45	0.00	0.00	0.00	37.37	20.76
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	1.57	0.00	0.00	0.00	2.52	2.52
95th-Percentile Queue Length [ft/ln]	39.31	0.00	0.00	0.00	63.07	63.07
d_A, Approach Delay [s/veh]	4.99		0.00		27.60	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	6.35					
Intersection LOS	E					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	35.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.060

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	348	809	411	1	8	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	348	809	411	1	8	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	202	103	0	2	42
Total Analysis Volume [veh/h]	348	809	411	1	8	166
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.30	0.01	0.00	0.00	0.06	0.26
d_M, Delay for Movement [s/veh]	9.50	0.00	0.00	0.00	35.25	13.70
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh/ln]	1.29	0.00	0.00	0.00	1.37	1.37
95th-Percentile Queue Length [ft/ln]	32.25	0.00	0.00	0.00	34.22	34.22
d_A, Approach Delay [s/veh]	2.86		0.00		14.69	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.36					
Intersection LOS	E					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.075

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	1136	33	22	485	30	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1136	33	22	485	30	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	284	8	6	121	8	5
Total Analysis Volume [veh/h]	1136	33	22	485	30	18
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.00	0.11	0.07
d_M, Delay for Movement [s/veh]	0.00	0.00	11.25	0.00	21.90	23.23
Movement LOS	A	A	B	A	C	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.11	0.00	0.68	0.68
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.86	0.00	16.98	16.98
d_A, Approach Delay [s/veh]	0.00		0.49		22.40	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.77					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.105

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	567	319	0	425	6	0	0	28	0	0	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	567	319	0	425	6	0	0	28	0	0	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	142	80	0	106	2	0	0	7	0	0	15
Total Analysis Volume [veh/h]	6	567	319	0	425	6	0	0	28	0	0	59
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.10
d_M, Delay for Movement [s/veh]	8.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.73	0.00	0.00	12.15
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.35
95th-Percentile Queue Length [ft/ln]	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	0.00	0.00	8.74
d_A, Approach Delay [s/veh]	0.06			0.00			9.73			12.15		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	0.74											
Intersection LOS	B											





*APPENDIX E-III*

**EXISTING PLUS PROJECT SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.423

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	96	608	67	164	491	156	159	656	85	146	681	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	608	67	164	491	156	159	656	85	146	681	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	152	17	41	123	39	40	164	21	37	170	41
Total Analysis Volume [veh/h]	96	608	67	164	491	156	159	656	85	146	681	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	14	44	0	14	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	61	61	6	61	61	10	21	21	7	17	17
g / C, Green / Cycle	0.05	0.55	0.55	0.05	0.56	0.56	0.09	0.19	0.19	0.06	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.11	0.04	0.05	0.12	0.12	0.09	0.13	0.14	0.04	0.12	0.09
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	184	3145	993	194	2108	998	165	712	337	211	889	281
d1, Uniform Delay [s]	50.81	12.38	11.48	51.54	12.34	12.35	49.84	41.80	42.14	50.74	44.54	43.18
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.29	0.14	0.13	9.71	0.22	0.47	25.10	1.23	3.07	4.04	1.41	1.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.19	0.07	0.85	0.21	0.21	0.97	0.69	0.73	0.69	0.77	0.59
d, Delay for Lane Group [s/veh]	53.10	12.51	11.62	61.25	12.57	12.82	74.94	43.03	45.21	54.78	45.95	45.13
Lane Group LOS	D	B	B	E	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.35	2.49	0.79	2.50	2.72	2.65	5.49	6.36	6.57	2.09	6.03	4.32
50th-Percentile Queue Length [ft/ln]	33.66	62.19	19.67	62.47	67.98	66.31	137.27	159.03	164.24	52.20	150.66	107.92
95th-Percentile Queue Length [veh/ln]	2.42	4.48	1.42	4.50	4.89	4.77	9.33	10.50	10.77	3.76	10.05	7.72
95th-Percentile Queue Length [ft/ln]	60.58	111.94	35.41	112.44	122.37	119.37	233.35	262.43	269.32	93.96	251.31	193.10

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	53.10	12.51	11.62	61.25	12.59	12.82	74.94	43.57	45.21	54.78	45.95	45.13
Movement LOS	D	B	B	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	17.49			22.48			49.26			47.11		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	35.35											
Intersection LOS	D											
Intersection V/C	0.423											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.021			2.947			2.859			3.062		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			727			727		
d_b, Bicycle Delay [s]	23.56			23.56			22.27			22.27		
I_b,int, Bicycle LOS Score for Intersection	1.984			2.006			2.055			2.105		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	18	705	560	50	709	20	36	97	15	520	67	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	705	560	50	709	20	36	97	15	520	67	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	176	140	13	177	5	9	24	4	130	17	0
Total Analysis Volume [veh/h]	18	705	560	50	709	20	36	97	15	520	67	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	33	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	61	5	63	63	8	8	8	21	21
g / C, Green / Cycle	0.02	0.55	0.04	0.57	0.57	0.07	0.07	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.12	0.03	0.15	0.08	0.02	0.05	0.01	0.16	0.16
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	43	3140	79	2168	1027	128	135	128	340	340
d1, Uniform Delay [s]	52.95	12.67	51.79	12.01	11.03	48.48	50.07	47.91	43.21	43.30
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.13	0.13
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.19	0.17	8.23	0.31	0.28	1.19	6.99	0.40	7.33	8.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.22	0.64	0.27	0.14	0.28	0.72	0.12	0.86	0.87
d, Delay for Lane Group [s/veh]	59.14	12.83	60.01	12.31	11.32	49.67	57.06	48.31	50.54	51.33
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.56	2.95	1.54	3.63	1.67	0.98	2.87	0.40	8.33	8.49
50th-Percentile Queue Length [ft/ln]	14.12	73.68	38.39	90.75	41.69	24.50	71.78	10.01	208.25	212.31
95th-Percentile Queue Length [veh/ln]	1.02	5.31	2.76	6.53	3.00	1.76	5.17	0.72	13.06	13.27
95th-Percentile Queue Length [ft/ln]	25.42	132.63	69.10	163.35	75.03	44.10	129.21	18.02	326.59	331.79

**Movement, Approach, & Intersection Results**

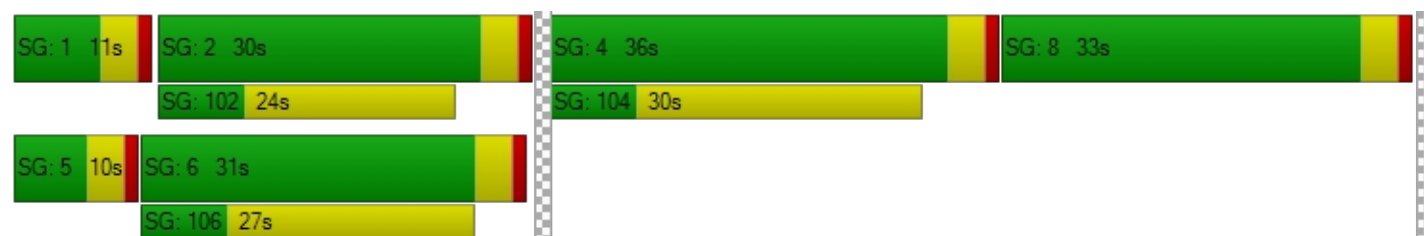
d_M, Delay for Movement [s/veh]	59.14	12.83	0.00	60.01	12.14	11.32	49.67	57.06	48.31	50.89	51.33	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	13.99			15.19			54.38			50.94		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.78											
Intersection LOS	C											
Intersection V/C	0.444											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.815			2.202			2.188		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			491			527			582		
d_b, Bicycle Delay [s]	32.07			31.31			29.82			27.65		
I_b,int, Bicycle LOS Score for Intersection	1.957			1.988			1.804			2.528		
Bicycle LOS	A			A			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.545

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	65	973	34	136	1097	14	31	64	65	45	92	325
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	973	34	136	1097	14	31	64	65	45	92	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	243	9	34	274	4	8	16	16	11	23	81
Total Analysis Volume [veh/h]	65	973	34	136	1097	14	31	64	65	45	92	325
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	11	59	0	14	62	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	68	68	10	73	73	20	20	20	20	20	34
g / C, Green / Cycle	0.05	0.62	0.62	0.09	0.66	0.66	0.18	0.18	0.18	0.18	0.18	0.31
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.04	0.29	0.01	0.02	0.03	0.04	0.03	0.05	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	88	1177	1115	323	2520	1193	280	340	322	304	340	554
d1, Uniform Delay [s]	51.60	10.96	10.91	47.11	8.77	6.29	37.70	38.34	38.44	38.00	38.94	32.14
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.20
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.47	1.21	1.24	0.87	0.55	0.02	0.17	0.26	0.30	0.22	0.42	1.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.74	0.44	0.44	0.42	0.44	0.01	0.11	0.19	0.20	0.15	0.27	0.59
d, Delay for Lane Group [s/veh]	63.07	12.17	12.16	47.98	9.32	6.31	37.87	38.61	38.74	38.22	39.36	33.99
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.05	6.65	6.21	1.80	5.90	0.11	0.71	1.49	1.52	1.04	2.18	7.53
50th-Percentile Queue Length [ft/ln]	51.17	166.25	155.36	44.95	147.45	2.76	17.82	37.35	38.07	26.06	54.60	188.22
95th-Percentile Queue Length [veh/ln]	3.68	10.88	10.30	3.24	9.88	0.20	1.28	2.69	2.74	1.88	3.93	12.03
95th-Percentile Queue Length [ft/ln]	92.10	271.98	257.57	80.92	247.02	4.97	32.08	67.22	68.52	46.90	98.28	300.72

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.07	12.16	12.16	47.98	9.32	6.31	37.87	38.61	38.74	38.22	39.36	33.99
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	15.25			13.51			38.52			35.47		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	18.95											
Intersection LOS	B											
Intersection V/C	0.545											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.818			3.006			2.221			2.445		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1055			600			600		
d_b, Bicycle Delay [s]	13.75			12.29			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.444			2.588			1.824			2.322		
Bicycle LOS	B			B			A			B		

**Sequence**




Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	72.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.384

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	48	13	15	55	7	4	44	21	41	60	15
Total Analysis Volume [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	33	0	0	34	0	0	43	43	0	43	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	13	13	59	13	13	13
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.39	0.11	0.11	0.54	0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.03	0.03	0.14	0.01	0.09	0.05	0.09	0.08	0.08
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	698	698	698	698	698	111	218	970	93	218	206
d1, Uniform Delay [s]	23.04	23.17	21.17	21.29	23.85	43.44	47.45	12.23	45.40	46.95	46.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.98	1.05	0.20	0.25	1.40	0.59	6.94	0.17	343.84	4.49	3.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.29	0.07	0.09	0.35	0.14	0.81	0.09	1.74	0.72	0.69
d, Delay for Lane Group [s/veh]	24.02	24.22	21.38	21.54	25.25	44.04	54.39	12.41	389.24	51.45	50.72
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.60	3.80	0.87	1.05	4.79	0.41	5.11	1.02	11.25	4.42	3.94
50th-Percentile Queue Length [ft/ln]	90.09	94.93	21.71	26.13	119.84	10.21	127.70	25.53	281.16	110.60	98.49
95th-Percentile Queue Length [veh/ln]	6.49	6.84	1.56	1.88	8.38	0.74	8.81	1.84	19.62	7.87	7.09
95th-Percentile Queue Length [ft/ln]	162.17	170.88	39.08	47.03	209.61	18.38	220.37	45.95	490.46	196.83	177.27

**Movement, Approach, & Intersection Results**

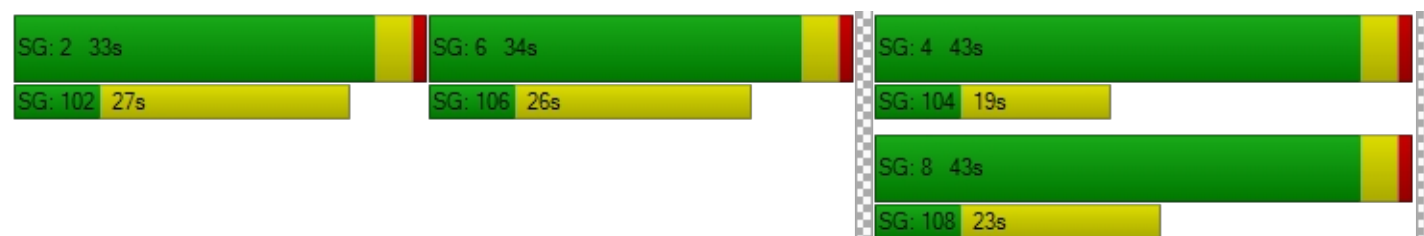
d_M, Delay for Movement [s/veh]	24.03	24.22	21.38	21.54	25.25	25.25	44.04	54.39	12.41	389.24	51.20	50.72
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	23.81			24.51			41.12			169.93		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	72.36											
Intersection LOS	E											
Intersection V/C	0.384											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.593			2.160			2.454			2.323		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			545			709			709		
d_b, Bicycle Delay [s]	29.82			29.09			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.296			2.068			2.013			1.940		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.318

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	124	92	429	328	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	124	92	429	328	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	31	23	107	82	3
Total Analysis Volume [veh/h]	16	124	92	429	328	11
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.23	0.17	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	158	158	1467	1595	1595	1511
d1, Uniform Delay [s]	46.12	49.09	1.49	1.83	1.71	1.42
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	8.33	0.08	0.41	0.29	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.06	0.27	0.21	0.01
d, Delay for Lane Group [s/veh]	46.40	57.42	1.57	2.24	2.00	1.43
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.42	3.69	0.23	1.30	0.93	0.03
50th-Percentile Queue Length [ft/ln]	10.38	92.26	5.72	32.52	23.21	0.65
95th-Percentile Queue Length [veh/ln]	0.75	6.64	0.41	2.34	1.67	0.05
95th-Percentile Queue Length [ft/ln]	18.69	166.07	10.30	58.53	41.78	1.17

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	46.40	57.42	1.57	2.24	2.00	1.43
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	56.16		2.12		1.98	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	9.64					
Intersection LOS	A					
Intersection V/C	0.318					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.160	2.266	2.205
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.992	4.692
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 85s

SG: 4 25s

SG: 101 26s



SG: 104 21s

SG: 8 25s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	16.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	42	982	30	26	983	55	56	64	58	105	134	104
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	982	30	26	983	55	56	64	58	105	134	104
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	246	8	7	246	14	14	16	15	26	34	26
Total Analysis Volume [veh/h]	42	982	30	26	983	55	56	64	58	105	134	104
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	10	55	0	11	30	0	15	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	83	76	76	83	75	75	19	8	8	19	10	10
g / C, Green / Cycle	0.75	0.69	0.69	0.75	0.68	0.68	0.17	0.07	0.07	0.17	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.02	0.27	0.27	0.01	0.28	0.28	0.03	0.03	0.03	0.06	0.07	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1204	1305	1236	1220	1287	1219	297	132	125	357	173	164
d1, Uniform Delay [s]	3.41	7.45	7.42	3.38	8.00	7.94	38.83	49.34	49.27	39.96	48.73	48.42
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.92	0.95	0.01	1.00	1.02	0.30	2.76	2.68	0.45	5.95	4.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.03	0.40	0.40	0.02	0.42	0.41	0.19	0.49	0.46	0.29	0.74	0.67
d, Delay for Lane Group [s/veh]	3.46	8.37	8.37	3.39	9.00	8.96	39.14	52.10	51.95	40.41	54.69	53.11
Lane Group LOS	A	A	A	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.22	5.13	4.80	0.12	5.57	5.15	1.32	1.80	1.63	2.54	3.70	3.14
50th-Percentile Queue Length [ft/ln]	5.41	128.15	120.04	3.10	139.22	128.85	33.01	44.88	40.65	63.60	92.40	78.51
95th-Percentile Queue Length [veh/ln]	0.39	8.84	8.40	0.22	9.44	8.88	2.38	3.23	2.93	4.58	6.65	5.65
95th-Percentile Queue Length [ft/ln]	9.74	220.98	209.88	5.58	235.98	221.94	59.42	80.78	73.17	114.47	166.32	141.31

**Movement, Approach, & Intersection Results**

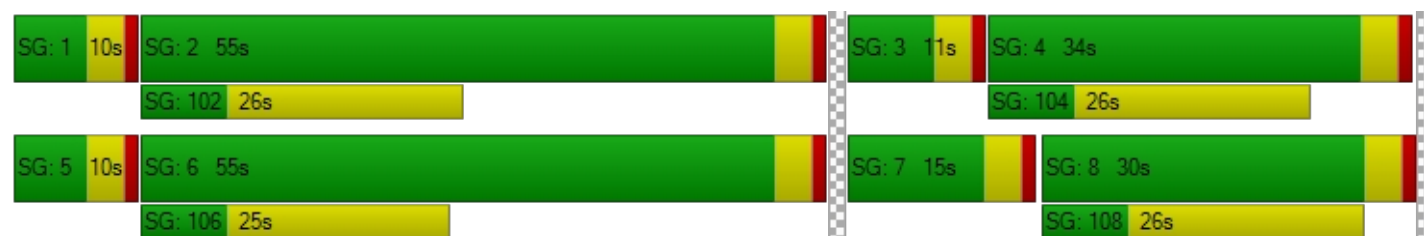
d_M, Delay for Movement [s/veh]	3.46	8.37	8.37	3.39	8.98	8.96	39.14	52.10	51.95	40.41	54.61	53.11
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.17			8.84			47.97			49.81		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	16.54											
Intersection LOS	B											
Intersection V/C	0.451											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.751			2.748			2.431			2.426		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			927			473			545		
d_b, Bicycle Delay [s]	15.82			15.82			32.07			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.429			2.437			1.706			1.843		
Bicycle LOS	B			B			A			A		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	109	924	129	134	829	133	195	432	109	357	709	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	924	129	134	829	133	195	432	109	357	709	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	231	32	34	207	33	49	108	27	89	177	25
Total Analysis Volume [veh/h]	109	924	129	134	829	133	195	432	109	357	709	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	15	50	0	19	54	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	53	53	63	53	53	39	20	20	39	25	25
g / C, Green / Cycle	0.57	0.48	0.48	0.57	0.48	0.48	0.36	0.18	0.18	0.36	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.28	0.07	0.27	0.25	0.11	0.15	0.14	0.20	0.19	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	768	909	861	723	911	863	426	351	333	485	855	405
d1, Uniform Delay [s]	10.86	21.09	20.74	11.03	20.31	19.96	25.45	43.09	42.59	28.31	40.66	35.02
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.39	3.01	2.86	0.12	2.43	2.31	0.77	4.69	3.64	2.19	2.15	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.61	0.58	0.19	0.56	0.53	0.46	0.82	0.76	0.74	0.83	0.25
d, Delay for Lane Group [s/veh]	11.25	24.10	23.60	11.15	22.75	22.27	26.23	47.78	46.22	30.50	42.81	35.33
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.27	10.90	9.73	1.51	9.58	8.49	3.76	7.91	6.85	7.76	9.33	2.24
50th-Percentile Queue Length [ft/ln]	31.84	272.40	243.25	37.77	239.41	212.37	93.90	197.82	171.31	193.95	233.20	55.99
95th-Percentile Queue Length [veh/ln]	2.29	16.31	14.85	2.72	14.65	13.27	6.76	12.53	11.15	12.33	14.34	4.03
95th-Percentile Queue Length [ft/ln]	57.31	407.73	371.14	67.98	366.29	331.86	169.02	313.16	278.63	308.15	358.42	100.78

**Movement, Approach, & Intersection Results**

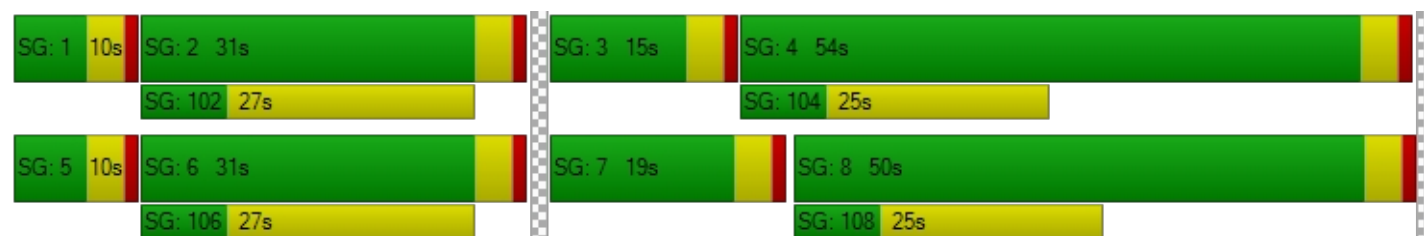
d_M, Delay for Movement [s/veh]	11.25	23.90	23.60	11.15	22.56	22.27	26.23	47.26	46.22	30.50	42.81	35.33
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	22.68			21.13			41.53			38.40		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.01											
Intersection LOS	C											
Intersection V/C	0.746											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.891			2.828			2.716			2.860		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			836			909		
d_b, Bicycle Delay [s]	31.31			31.31			18.62			16.36		
I_b,int, Bicycle LOS Score for Intersection	2.518			2.464			2.167			2.522		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	33.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	99	298	106	165	451	370	126	528	116	269	672	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	298	106	165	451	370	126	528	116	269	672	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	75	27	41	113	93	32	132	29	67	168	12
Total Analysis Volume [veh/h]	99	298	106	165	451	370	126	528	116	269	672	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	10	31	0	13	54	0	14	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	65	55	55	65	56	56	9	23	23	10	24	24
g / C, Green / Cycle	0.59	0.50	0.50	0.59	0.50	0.50	0.08	0.21	0.21	0.09	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.06	0.09	0.24	0.21	0.07	0.18	0.17	0.08	0.18	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	873	1905	903	1080	958	907	148	392	371	320	819	388
d1, Uniform Delay [s]	9.64	14.85	14.54	10.03	17.76	17.05	49.83	42.25	41.70	49.22	41.17	34.78
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	0.18	0.27	0.06	1.66	1.36	12.42	5.98	4.42	5.88	2.12	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.11	0.16	0.12	0.15	0.47	0.41	0.85	0.87	0.82	0.84	0.82	0.12
d, Delay for Lane Group [s/veh]	9.91	15.02	14.81	10.10	19.42	18.41	62.25	48.23	46.12	55.09	43.29	34.91
Lane Group LOS	A	B	B	B	B	B	E	D	D	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.06	2.04	1.46	1.75	7.69	6.05	3.92	9.53	8.25	3.89	8.86	1.01
50th-Percentile Queue Length [ft/ln]	26.58	50.99	36.38	43.80	192.15	151.19	98.07	238.26	206.36	97.22	221.43	25.27
95th-Percentile Queue Length [veh/ln]	1.91	3.67	2.62	3.15	12.23	10.08	7.06	14.59	12.97	7.00	13.74	1.82
95th-Percentile Queue Length [ft/ln]	47.84	91.79	65.48	78.85	305.81	252.01	176.53	364.84	324.16	175.00	343.45	45.49

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	9.91	15.02	14.81	10.10	19.42	18.41	62.25	47.48	46.12	55.09	43.29	34.91
Movement LOS	A	B	B	B	B	B	E	D	D	E	D	C
d_A, Approach Delay [s/veh]	13.97			17.48			49.69			46.12		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	33.28											
Intersection LOS	C											
Intersection V/C	0.608											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.680			2.593			2.756			2.974		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			909			927		
d_b, Bicycle Delay [s]	30.56			31.31			16.36			15.82		
I_b,int, Bicycle LOS Score for Intersection	1.975			2.373			2.195			2.374		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.473

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	20	19	731	15	323	46	711	3	18	724	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	20	19	731	15	323	46	711	3	18	724	166
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	5	183	4	81	12	178	1	5	181	42
Total Analysis Volume [veh/h]	5	20	19	731	15	323	46	711	3	18	724	166
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	27	35	67	67	67	58	58	89
g / C, Green / Cycle	0.04	0.04	0.04	0.24	0.32	0.61	0.61	0.61	0.53	0.53	0.81
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.21	0.19	0.03	0.19	0.19	0.01	0.19	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	78	73	853	577	981	1152	1092	807	2008	1455
d1, Uniform Delay [s]	50.76	51.16	51.16	39.80	31.26	8.74	10.56	10.55	12.35	15.11	2.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.73	1.83	2.64	0.95	0.02	0.73	0.77	0.05	0.50	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.26	0.26	0.86	0.59	0.05	0.32	0.32	0.02	0.36	0.11
d, Delay for Lane Group [s/veh]	51.25	52.89	53.00	42.43	32.20	8.76	11.28	11.32	12.41	15.61	2.26
Lane Group LOS	D	D	D	D	C	A	B	B	B	B	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.57	0.55	9.66	7.60	0.44	4.38	4.16	0.22	5.29	0.55
50th-Percentile Queue Length [ft/ln]	3.54	14.29	13.63	241.55	189.88	10.91	109.61	103.96	5.52	132.16	13.86
95th-Percentile Queue Length [veh/ln]	0.25	1.03	0.98	14.76	12.12	0.79	7.82	7.48	0.40	9.06	1.00
95th-Percentile Queue Length [ft/ln]	6.37	25.73	24.53	369.00	302.88	19.63	195.46	187.12	9.93	226.43	24.95

**Movement, Approach, & Intersection Results**

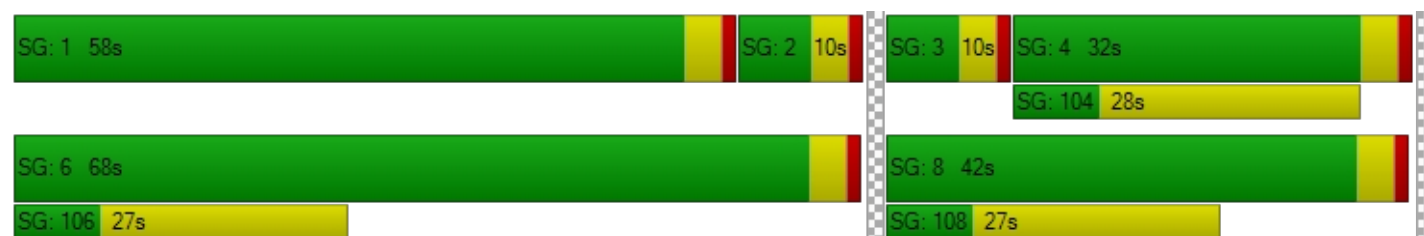
d_M, Delay for Movement [s/veh]	51.25	52.89	53.00	42.43	32.20	32.20	8.76	11.30	11.32	12.41	15.61	2.26
Movement LOS	D	D	D	D	C	C	A	B	B	B	B	A
d_A, Approach Delay [s/veh]	52.75			39.20			11.15			13.11		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.23											
Intersection LOS	C											
Intersection V/C	0.473											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.186			2.494			2.670			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.632			3.323			2.187			2.309		
Bicycle LOS	A			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	79	107	120	77	123	60	53	1164	217	88	740	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	107	120	77	123	60	53	1164	217	88	740	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	27	30	19	31	15	13	291	54	22	185	15
Total Analysis Volume [veh/h]	79	107	120	77	123	60	53	1164	217	88	740	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	61	0	10	61	0	10	29	0	10	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	10	8	8	8	83	73	73	83	74	74
g / C, Green / Cycle	0.09	0.09	0.09	0.07	0.07	0.07	0.75	0.66	0.66	0.75	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.07	0.04	0.05	0.05	0.03	0.38	0.36	0.05	0.22	0.21
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	186	171	162	228	139	132	1275	1261	1194	1064	1274	1207
d1, Uniform Delay [s]	46.02	48.28	48.81	49.37	49.79	49.65	3.52	10.07	9.81	3.59	7.65	7.59
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.54	3.73	6.51	0.87	6.09	5.47	0.01	1.91	1.82	0.15	0.68	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.63	0.74	0.34	0.69	0.66	0.04	0.57	0.55	0.08	0.33	0.32
d, Delay for Lane Group [s/veh]	47.56	52.01	55.32	50.24	55.89	55.12	3.53	11.98	11.63	3.74	8.33	8.28
Lane Group LOS	D	D	E	D	E	E	A	B	B	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	3.00	3.50	2.10	2.82	2.51	0.26	9.31	8.24	0.48	4.06	3.73
50th-Percentile Queue Length [ft/ln]	53.48	75.09	87.45	52.54	70.54	62.81	6.55	232.83	205.92	12.03	101.54	93.21
95th-Percentile Queue Length [veh/ln]	3.85	5.41	6.30	3.78	5.08	4.52	0.47	14.32	12.94	0.87	7.31	6.71
95th-Percentile Queue Length [ft/ln]	96.26	135.15	157.41	94.57	126.97	113.05	11.80	357.95	323.58	21.66	182.77	167.79

**Movement, Approach, & Intersection Results**

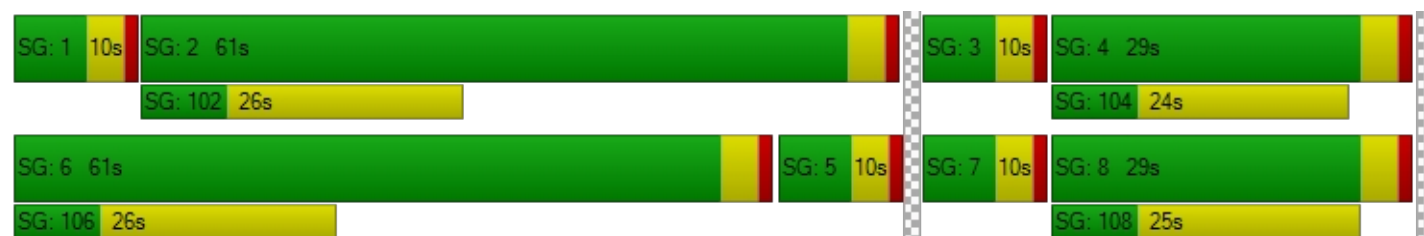
d_M, Delay for Movement [s/veh]	47.56	52.01	55.32	50.24	55.72	55.12	3.53	11.85	11.63	3.74	8.31	8.28
Movement LOS	D	D	E	D	E	E	A	B	B	A	A	A
d_A, Approach Delay [s/veh]	52.16			53.96			11.51			7.85		
Approach LOS	D			D			B			A		
d_I, Intersection Delay [s/veh]	18.51											
Intersection LOS	B											
Intersection V/C	0.590											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.538			2.310			2.854			2.753		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1036			1036			455			455		
d_b, Bicycle Delay [s]	12.77			12.77			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.065			1.774			2.743			2.292		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.439

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	32	33	70	56	48	32	21	1231	29	44	863	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	33	70	56	48	32	21	1231	29	44	863	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	8	18	14	12	8	5	308	7	11	216	9
Total Analysis Volume [veh/h]	32	33	70	56	48	32	21	1231	29	44	863	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	95	87	87	95	88	88
g / C, Green / Cycle	0.06	0.06	0.06	0.06	0.06	0.86	0.79	0.79	0.86	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.04	0.03	0.04	0.01	0.34	0.34	0.02	0.24	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	75	121	115	122	115	1514	1494	1415	1428	1521	1441
d1, Uniform Delay [s]	49.08	49.06	50.16	49.76	50.45	1.03	3.82	3.81	1.05	2.90	2.88
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.87	1.20	5.19	2.67	7.46	0.00	0.92	0.96	0.04	0.52	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.27	0.61	0.46	0.70	0.01	0.43	0.43	0.03	0.31	0.30
d, Delay for Lane Group [s/veh]	52.95	50.27	55.35	52.43	57.92	1.04	4.75	4.77	1.09	3.42	3.42
Lane Group LOS	D	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.92	0.90	2.04	1.58	2.39	0.03	3.96	3.73	0.07	2.18	2.04
50th-Percentile Queue Length [ft/ln]	22.96	22.61	50.98	39.44	59.79	0.71	99.11	93.31	1.83	54.55	50.97
95th-Percentile Queue Length [veh/ln]	1.65	1.63	3.67	2.84	4.31	0.05	7.14	6.72	0.13	3.93	3.67
95th-Percentile Queue Length [ft/ln]	41.33	40.71	91.76	71.00	107.63	1.29	178.40	167.96	3.30	98.19	91.75

**Movement, Approach, & Intersection Results**

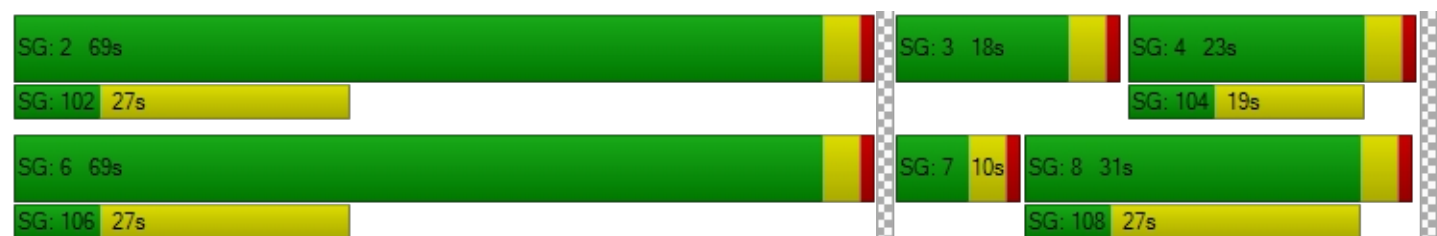
d_M, Delay for Movement [s/veh]	52.95	50.27	55.35	52.43	57.92	57.92	1.04	4.76	4.77	1.09	3.42	3.42
Movement LOS	D	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.54			55.66			4.70			3.31		
Approach LOS	D			E			A			A		
d_I, Intersection Delay [s/veh]	9.59											
Intersection LOS	A											
Intersection V/C	0.439											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.253			2.048			2.785			2.838		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.782			1.784			2.616			2.338		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	117	327	104	170	299	250	261	1081	90	124	601	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	327	104	170	299	250	261	1081	90	124	601	136
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	82	26	43	75	63	65	270	23	31	150	34
Total Analysis Volume [veh/h]	117	327	104	170	299	250	261	1081	90	124	601	136
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	22	48	0	13	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	42	42	7	42	57	12	35	35	9	33	33
g / C, Green / Cycle	0.07	0.39	0.39	0.07	0.38	0.52	0.10	0.32	0.32	0.08	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.06	0.05	0.08	0.14	0.07	0.28	0.05	0.07	0.16	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	133	1462	692	239	1439	937	369	1211	574	150	1126	533
d1, Uniform Delay [s]	50.52	22.83	22.15	50.28	23.08	14.71	47.64	35.74	26.92	49.75	32.41	29.51
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.05	0.35	0.46	3.89	0.33	0.15	2.49	2.53	0.13	10.98	0.39	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.88	0.22	0.15	0.71	0.21	0.27	0.71	0.89	0.16	0.83	0.53	0.25
d, Delay for Lane Group [s/veh]	66.57	23.19	22.60	54.17	23.41	14.86	50.13	38.27	27.04	60.73	32.80	29.76
Lane Group LOS	E	C	C	D	C	B	D	D	C	E	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.78	2.92	1.84	2.42	2.68	3.45	3.58	13.98	1.72	3.81	6.71	2.78
50th-Percentile Queue Length [ft/ln]	94.51	72.93	46.09	60.49	66.89	86.37	89.53	349.50	43.00	95.24	167.80	69.44
95th-Percentile Queue Length [veh/ln]	6.80	5.25	3.32	4.35	4.82	6.22	6.45	20.11	3.10	6.86	10.96	5.00
95th-Percentile Queue Length [ft/ln]	170.11	131.27	82.97	108.87	120.41	155.46	161.15	502.79	77.40	171.43	274.02	125.00

**Movement, Approach, & Intersection Results**

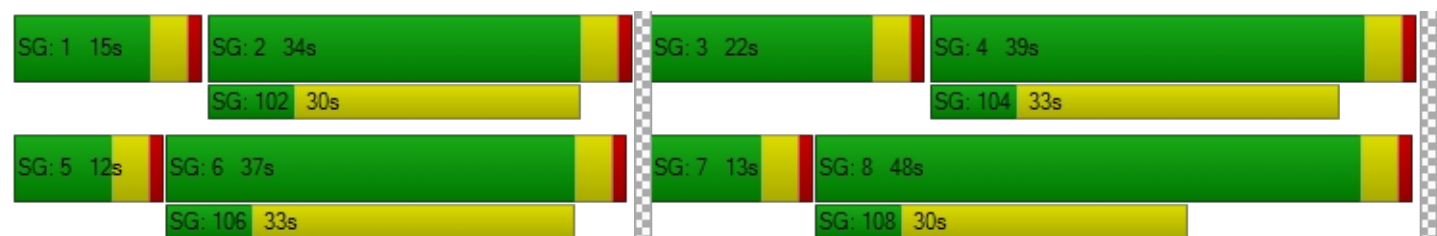
d_M, Delay for Movement [s/veh]	66.57	23.19	22.60	54.17	23.41	14.86	50.13	38.27	27.04	60.73	32.80	29.76
Movement LOS	E	C	C	D	C	B	D	D	C	E	C	C
d_A, Approach Delay [s/veh]	32.34			27.71			39.73			36.34		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.34											
Intersection LOS	D											
Intersection V/C	0.632											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.635			2.804			2.938			2.823		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			800			636		
d_b, Bicycle Delay [s]	29.09			26.95			19.80			25.57		
I_b,int, Bicycle LOS Score for Intersection	2.012			2.153			2.741			2.270		
Bicycle LOS	B			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.735

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	0	33	0	230	167	95	222	0
Total Analysis Volume [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	14	0	0	19	0	77	96	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	63	63	25	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.24	0.37	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		163	163	2160	1023	417	3179
d1, Uniform Delay [s]		48.16	49.08	13.50	16.27	41.13	1.92
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.76	9.35	0.61	3.23	7.84	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.62	0.81	0.42	0.65	0.91	0.28
d, Delay for Lane Group [s/veh]		51.93	58.43	14.11	19.49	48.97	2.14
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.84	4.00	6.42	11.83	10.79	1.32
50th-Percentile Queue Length [ft/ln]		70.88	100.00	160.43	295.75	269.84	32.99
95th-Percentile Queue Length [veh/ln]		5.10	7.20	10.57	17.47	16.18	2.38
95th-Percentile Queue Length [ft/ln]		127.58	180.00	264.29	436.77	404.54	59.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	51.93	51.93	58.43	0.00	14.11	19.49	48.97	2.14	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.62			16.38			16.15		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	19.26											
Intersection LOS	B											
Intersection V/C	0.735											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.453	1.838	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	182	273	1673
d_b, Bicycle Delay [s]	55.00	45.45	41.02	1.47
I_b,int, Bicycle LOS Score for Intersection	4.132	1.946	2.431	2.605
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	120	0	106	0	0	0	89	178	0	0	203	37
Total Analysis Volume [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	55	0	0	0	0	0	36	55	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		24	80	52	52
g / C, Green / Cycle	0.20	0.20	0.20		0.22	0.72	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.16		0.20	0.19	0.25	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	367	367	367		392	2749	892	845
d1, Uniform Delay [s]	42.00	41.89	41.73		41.91	5.17	20.68	21.08
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.02	4.67	4.27		7.92	0.23	2.31	2.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.81		0.90	0.26	0.54	0.57
d, Delay for Lane Group [s/veh]	47.02	46.56	46.00		49.83	5.40	23.00	23.83
Lane Group LOS	D	D	D		D	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.42	8.26	8.05		10.12	2.52	9.11	9.34
50th-Percentile Queue Length [ft/ln]	210.58	206.49	201.22		253.10	62.93	227.68	233.54
95th-Percentile Queue Length [veh/ln]	13.18	12.97	12.70		15.34	4.53	14.06	14.35
95th-Percentile Queue Length [ft/ln]	329.58	324.32	317.54		383.56	113.27	351.41	358.86

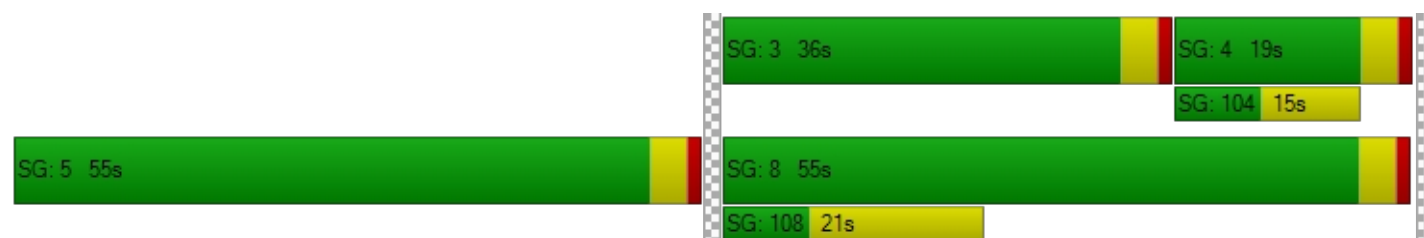
### Movement, Approach, & Intersection Results

[illegible]

## Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.244	1.922	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	927	273
d_b, Bicycle Delay [s]	55.00	55.00	15.82	41.02
I_b,int, Bicycle LOS Score for Intersection	5.626	4.132	2.437	2.350
Bicycle LOS	F	D	B	B

## Sequence

[illegible]

**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	4.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.308

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	26	500	17	14	929	11	12	13	31	11	14	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	500	17	14	929	11	12	13	31	11	14	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	125	4	4	232	3	3	3	8	3	4	3
Total Analysis Volume [veh/h]	26	500	17	14	929	11	12	13	31	11	14	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.14	0.14	0.01	0.25	0.25	0.03	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1538	1676	1588	1577	1676	1588	121	124
d1, Uniform Delay [s]	0.77	0.89	0.89	0.77	1.02	1.02	51.73	51.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.20	0.21	0.01	0.44	0.46	2.75	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.16	0.16	0.01	0.29	0.29	0.46	0.30
d, Delay for Lane Group [s/veh]	0.79	1.09	1.10	0.78	1.46	1.48	54.47	52.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.31	0.30	0.01	0.66	0.63	1.61	1.04
50th-Percentile Queue Length [ft/ln]	0.68	7.86	7.49	0.36	16.56	15.86	40.29	25.98
95th-Percentile Queue Length [veh/ln]	0.05	0.57	0.54	0.03	1.19	1.14	2.90	1.87
95th-Percentile Queue Length [ft/ln]	1.23	14.15	13.48	0.65	29.81	28.55	72.52	46.76

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.79	1.09	1.10	0.78	1.47	1.48	54.47	54.47	54.47	52.51	52.51	52.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.08			1.46			54.47			52.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.38											
Intersection LOS	A											
Intersection V/C	0.308											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.620			2.615			1.814			1.784		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.008			2.347			1.652			1.621		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	62	944	72	81	1061	164	183	384	72	108	391	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	944	72	81	1061	164	183	384	72	108	391	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	236	18	20	265	41	46	96	18	27	98	39
Total Analysis Volume [veh/h]	62	944	72	81	1061	164	183	384	72	108	391	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	50	40	40	50	41	41	52	42	42	52	39	39
g / C, Green / Cycle	0.45	0.37	0.37	0.45	0.37	0.37	0.47	0.38	0.38	0.47	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.03	0.25	0.04	0.05	0.34	0.32	0.10	0.10	0.04	0.06	0.10	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	330	1395	661	527	704	667	820	1457	690	825	1354	641
d1, Uniform Delay [s]	16.98	29.33	22.97	17.16	32.93	32.24	17.02	23.29	21.81	16.26	25.43	25.00
k, delay calibration	0.11	0.11	0.11	0.11	0.24	0.22	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	0.58	0.07	0.13	10.09	7.20	0.14	0.44	0.30	0.33	0.54	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.68	0.11	0.15	0.91	0.87	0.22	0.26	0.10	0.13	0.29	0.24
d, Delay for Lane Group [s/veh]	17.25	29.92	23.04	17.30	43.02	39.44	17.16	23.73	22.11	16.59	25.97	25.91
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.91	10.45	1.25	1.19	17.84	15.43	2.72	3.49	1.25	1.59	3.76	3.05
50th-Percentile Queue Length [ft/ln]	22.80	261.29	31.20	29.78	445.96	385.75	68.06	87.36	31.35	39.83	93.94	76.19
95th-Percentile Queue Length [veh/ln]	1.64	15.75	2.25	2.14	24.77	21.87	4.90	6.29	2.26	2.87	6.76	5.49
95th-Percentile Queue Length [ft/ln]	41.03	393.84	56.16	53.60	619.13	546.80	122.51	157.24	56.42	71.70	169.09	137.14

**Movement, Approach, & Intersection Results**

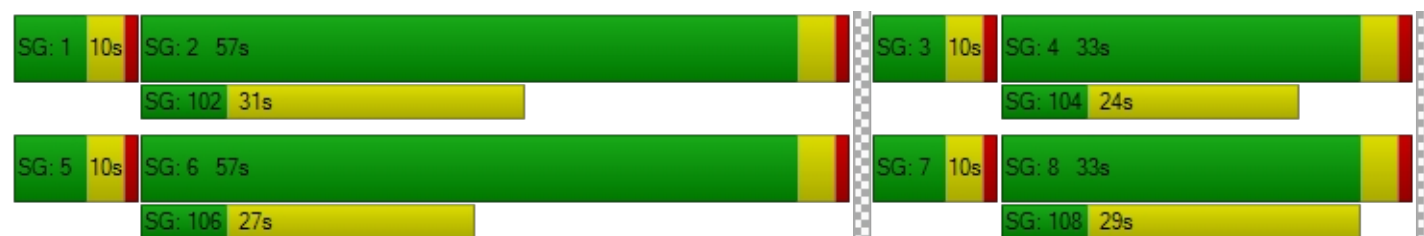
d_M, Delay for Movement [s/veh]	17.25	29.92	23.04	17.30	41.61	39.44	17.16	23.73	22.11	16.59	25.97	25.91
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	28.73			39.83			21.67			24.41		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.67											
Intersection LOS	C											
Intersection V/C	0.615											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.901			2.912			2.701			2.701		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			527		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.449			2.637			2.087			2.101		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	116	464	200	31	807	85	43	428	96	218	435	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	464	200	31	807	85	43	428	96	218	435	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	116	50	8	202	21	11	107	24	55	109	7
Total Analysis Volume [veh/h]	116	464	200	31	807	85	43	428	96	218	435	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	58	0	12	55	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	32	32	30	30	30	4	49	49	9	53	53
g / C, Green / Cycle	0.29	0.29	0.29	0.27	0.27	0.27	0.04	0.44	0.44	0.08	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	0.11	0.02	0.25	0.24	0.02	0.11	0.05	0.06	0.11	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	228	1119	530	412	523	495	74	1676	794	296	1843	873
d1, Uniform Delay [s]	29.29	31.22	30.83	29.44	38.33	37.91	51.88	19.38	18.16	49.19	16.49	14.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.75	0.25	0.44	0.08	5.48	4.54	7.16	0.37	0.31	3.54	0.30	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	0.41	0.38	0.08	0.89	0.86	0.58	0.26	0.12	0.74	0.24	0.03
d, Delay for Lane Group [s/veh]	31.04	31.46	31.27	29.52	43.81	42.45	59.04	19.74	18.47	52.73	16.79	14.89
Lane Group LOS	C	C	C	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.43	4.98	4.27	0.62	12.69	11.40	1.31	3.50	1.51	3.06	3.23	0.37
50th-Percentile Queue Length [ft/ln]	60.71	124.43	106.76	15.43	317.36	284.88	32.79	87.58	37.64	76.61	80.70	9.19
95th-Percentile Queue Length [veh/ln]	4.37	8.64	7.66	1.11	18.54	16.93	2.36	6.31	2.71	5.52	5.81	0.66
95th-Percentile Queue Length [ft/ln]	109.27	215.91	191.49	27.77	463.43	423.28	59.02	157.64	67.76	137.90	145.25	16.54

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	31.04	31.46	31.27	29.52	43.23	42.45	59.04	19.74	18.47	52.73	16.79	14.89
Movement LOS	C	C	C	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	31.35			42.70			22.51			28.24		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	32.49											
Intersection LOS	C											
Intersection V/C	0.524											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.771			2.594			2.752			2.800		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			927			473			473		
d_b, Bicycle Delay [s]	14.25			15.82			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.203			2.321			2.027			2.121		
Bicycle LOS	B			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.543

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	65	1163	35	17	1363	26	43	97	89	74	90	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	1163	35	17	1363	26	43	97	89	74	90	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	291	9	4	341	7	11	24	22	19	23	6
Total Analysis Volume [veh/h]	65	1163	35	17	1363	26	43	97	89	74	90	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	30	0	0	30	0	0	80	0	0	80	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.32	0.01	0.38	0.37	0.13	0.04	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1182	1484	1406	1228	1484	1406	302	77	263
d1, Uniform Delay [s]	2.72	3.89	3.87	2.65	4.21	4.20	45.84	41.72	42.71
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.86	0.90	0.02	1.12	1.17	3.93	38.97	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.42	0.41	0.01	0.48	0.48	0.76	0.96	0.43
d, Delay for Lane Group [s/veh]	2.81	4.75	4.77	2.67	5.33	5.37	49.77	80.69	43.84
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.29	3.84	3.60	0.07	4.83	4.56	6.41	2.62	2.90
50th-Percentile Queue Length [ft/ln]	7.14	96.01	90.11	1.81	120.64	113.88	160.15	65.50	72.53
95th-Percentile Queue Length [veh/ln]	0.51	6.91	6.49	0.13	8.43	8.06	10.56	4.72	5.22
95th-Percentile Queue Length [ft/ln]	12.85	172.83	162.20	3.25	210.70	201.38	263.92	117.91	130.56

**Movement, Approach, & Intersection Results**

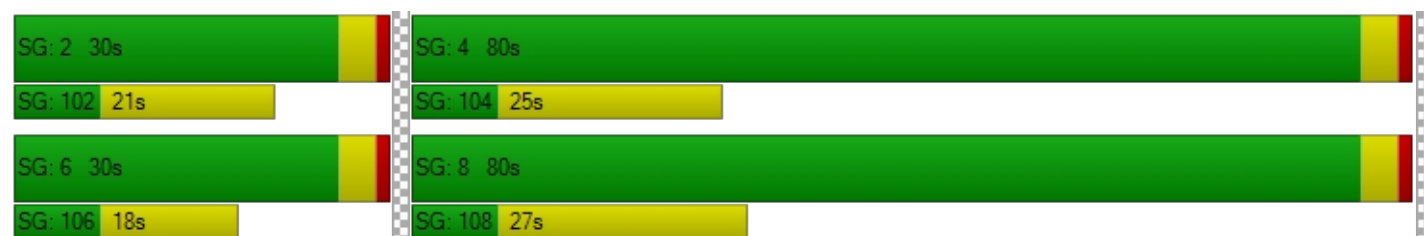
d_M, Delay for Movement [s/veh]	2.81	4.76	4.77	2.67	5.35	5.37	49.77	49.77	49.77	80.69	43.84	43.84
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.66			5.32			49.77			58.35		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.58											
Intersection LOS	B											
Intersection V/C	0.543											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.959			2.885			2.017			2.083		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1382			1382		
d_b, Bicycle Delay [s]	32.07			32.07			5.25			5.25		
I_b,int, Bicycle LOS Score for Intersection	2.602			2.720			1.937			1.870		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.430

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	103	809	64	59	1025	53	41	43	97	104	38	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	809	64	59	1025	53	41	43	97	104	38	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	202	16	15	256	13	10	11	24	26	10	12
Total Analysis Volume [veh/h]	103	809	64	59	1025	53	41	43	97	104	38	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.24	0.23	0.03	0.29	0.29	0.10	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1321	1528	1448	1358	1528	1448	261	272
d1, Uniform Delay [s]	2.23	2.76	2.74	2.17	2.97	2.95	46.99	47.20
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.50	0.51	0.06	0.68	0.69	3.29	3.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.30	0.29	0.04	0.37	0.36	0.69	0.69
d, Delay for Lane Group [s/veh]	2.34	3.26	3.24	2.23	3.65	3.65	50.28	50.34
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.38	2.06	1.89	0.21	2.73	2.54	5.05	5.25
50th-Percentile Queue Length [ft/ln]	9.50	51.39	47.27	5.28	68.26	63.46	126.18	131.33
95th-Percentile Queue Length [veh/ln]	0.68	3.70	3.40	0.38	4.91	4.57	8.73	9.01
95th-Percentile Queue Length [ft/ln]	17.10	92.50	85.09	9.51	122.87	114.22	218.29	225.31

**Movement, Approach, & Intersection Results**

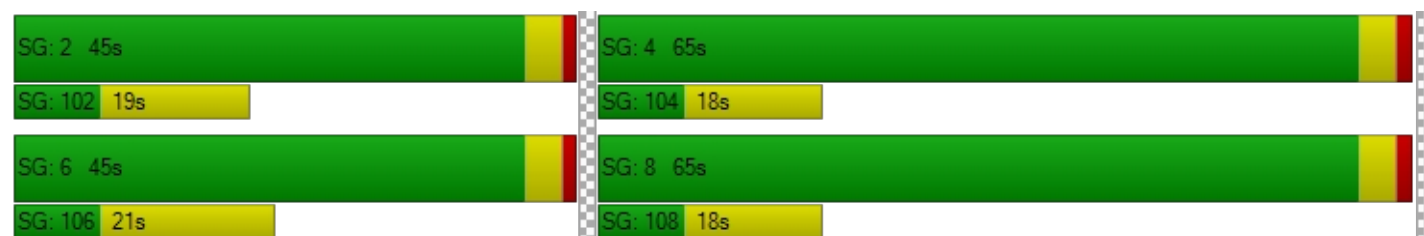
d_M, Delay for Movement [s/veh]	2.34	3.25	3.24	2.23	3.65	3.65	50.28	50.28	50.28	50.34	50.34	50.34
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.15			3.57			50.28			50.34		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.36											
Intersection LOS	B											
Intersection V/C	0.430											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.887			2.764			2.054			1.981		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.365			2.498			1.858			1.870		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	38.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.759

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	230	1131	196	197	1279	161	233	689	258	223	820	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1131	196	197	1279	161	233	689	258	223	820	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	283	49	49	320	40	58	172	65	56	205	46
Total Analysis Volume [veh/h]	230	1131	196	197	1279	161	233	689	258	223	820	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	11	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	37	37	7	36	36	16	35	35	15	34	34
g / C, Green / Cycle	0.07	0.34	0.34	0.06	0.33	0.33	0.15	0.32	0.32	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.11	0.06	0.31	0.15	0.13	0.12	0.14	0.12	0.14	0.10
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1284	608	223	1249	592	262	1806	570	245	1752	553
d1, Uniform Delay [s]	50.62	34.34	27.06	51.10	35.88	29.05	46.11	29.19	29.96	46.85	30.82	29.39
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.29	2.16	0.30	10.97	4.28	0.53	9.87	0.61	2.58	12.32	0.90	1.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.88	0.32	0.88	0.94	0.45	0.89	0.38	0.45	0.91	0.47	0.33
d, Delay for Lane Group [s/veh]	61.91	36.49	27.37	62.07	40.16	29.58	55.99	29.81	32.54	59.18	31.72	31.01
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.53	14.35	3.87	3.02	15.74	5.55	6.93	4.80	5.82	6.83	5.98	3.99
50th-Percentile Queue Length [ft/ln]	88.30	358.74	96.66	75.62	393.49	138.76	173.37	119.94	145.53	170.71	149.57	99.87
95th-Percentile Queue Length [veh/ln]	6.36	20.56	6.96	5.44	22.25	9.41	11.25	8.39	9.78	11.11	9.99	7.19
95th-Percentile Queue Length [ft/ln]	158.94	514.05	173.99	136.12	556.16	235.35	281.33	209.75	244.45	277.85	249.86	179.77

**Movement, Approach, & Intersection Results**

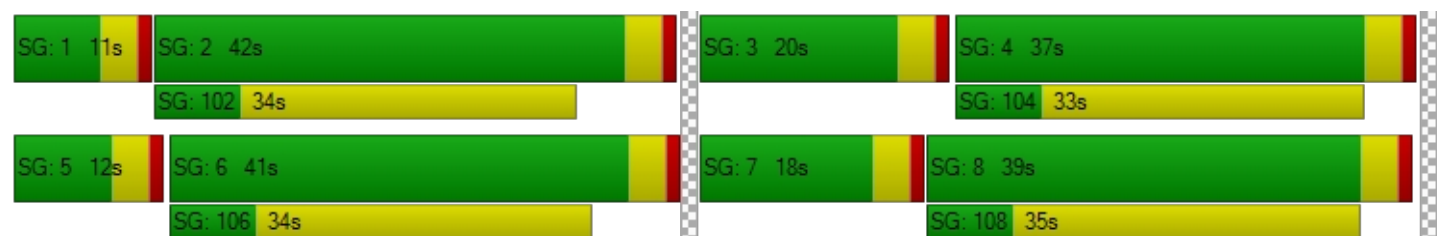
d_M, Delay for Movement [s/veh]	61.91	36.49	27.37	62.07	39.30	29.58	55.99	29.81	32.54	59.18	31.72	31.01
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	39.10			41.09			35.57			36.61		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.39											
Intersection LOS	D											
Intersection V/C	0.759											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.139			3.047			3.026			3.016		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			673			636			600		
d_b, Bicycle Delay [s]	23.56			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.844			2.460			2.209			2.234		
Bicycle LOS	C			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.725

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	297	824	90	168	1024	148	167	577	228	120	479	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	297	824	90	168	1024	148	167	577	228	120	479	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	206	23	42	256	37	42	144	57	30	120	29
Total Analysis Volume [veh/h]	297	824	90	168	1024	148	167	577	228	120	479	117
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	10	41	0	10	49	0	10	49	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	33	33	43	33	33	10	49	49	6	45	45
g / C, Green / Cycle	0.39	0.30	0.30	0.39	0.30	0.30	0.09	0.45	0.45	0.05	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.17	0.22	0.05	0.09	0.27	0.08	0.09	0.15	0.13	0.03	0.17	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	334	1139	540	449	1139	540	166	1698	804	186	775	734
d1, Uniform Delay [s]	24.45	34.44	28.39	22.51	36.92	29.38	49.94	19.84	19.27	51.06	23.12	22.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.06	0.89	0.14	0.52	2.85	0.27	34.24	0.54	0.88	3.69	1.59	1.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.89	0.72	0.17	0.37	0.90	0.27	1.01	0.34	0.28	0.64	0.41	0.38
d, Delay for Lane Group [s/veh]	32.50	35.32	28.53	23.03	39.77	29.66	84.18	20.39	20.15	54.75	24.71	24.33
Lane Group LOS	C	D	C	C	D	C	F	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.34	9.88	1.78	2.98	13.42	3.03	6.12	4.90	3.86	1.71	6.10	5.34
50th-Percentile Queue Length [ft/ln]	158.57	246.95	44.38	74.48	335.62	75.64	153.02	122.41	96.42	42.85	152.43	133.62
95th-Percentile Queue Length [veh/ln]	10.47	15.03	3.20	5.36	19.43	5.45	10.20	8.53	6.94	3.09	10.15	9.14
95th-Percentile Queue Length [ft/ln]	261.82	375.81	79.88	134.07	485.84	136.16	255.12	213.13	173.55	77.13	253.67	228.40

**Movement, Approach, & Intersection Results**

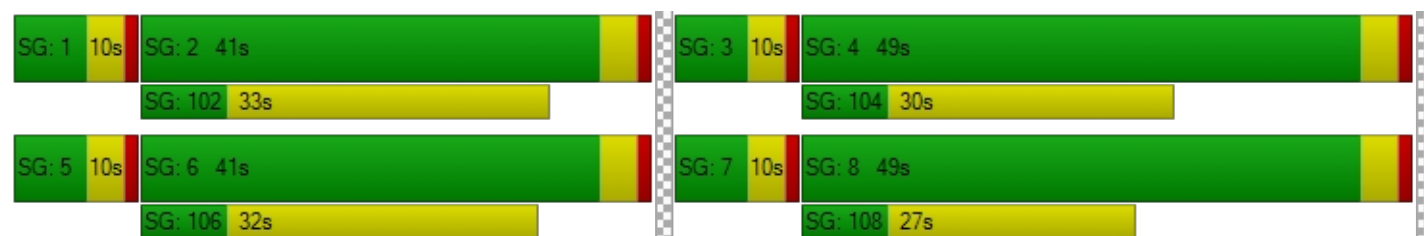
d_M, Delay for Movement [s/veh]	32.50	35.32	28.53	23.03	39.77	29.66	84.18	20.39	20.15	54.75	24.58	24.33
Movement LOS	C	D	C	C	D	C	F	C	C	D	C	C
d_A, Approach Delay [s/veh]	34.13			36.55			31.29			29.60		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	33.48											
Intersection LOS	C											
Intersection V/C	0.725											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.882			2.860			2.960			2.895		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			673			818			818		
d_b, Bicycle Delay [s]	24.22			24.22			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.559			2.665			2.094			2.150		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	398	0	0	368	180	0	0	0	54	124	114
Total Analysis Volume [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.38	0.41		0.12	0.13	0.25
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	203	3574	2010	952		527	1113	527
d1, Uniform Delay [s]	45.80	9.65	18.03	18.68		28.41	28.76	33.50
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.23	0.40	2.34	5.92		0.51	0.28	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.45	0.73	0.77		0.41	0.45	0.87
d, Delay for Lane Group [s/veh]	48.03	10.05	20.38	24.60		28.92	29.04	37.97
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.39	5.63	12.76	14.11		4.19	4.83	10.92
50th-Percentile Queue Length [ft/ln]	34.64	140.84	318.99	352.64		104.70	120.85	272.93
95th-Percentile Queue Length [veh/ln]	2.49	9.53	18.62	20.26		7.54	8.44	16.34
95th-Percentile Queue Length [ft/ln]	62.35	238.15	465.45	506.62		188.45	211.00	408.40

**Movement, Approach, & Intersection Results**

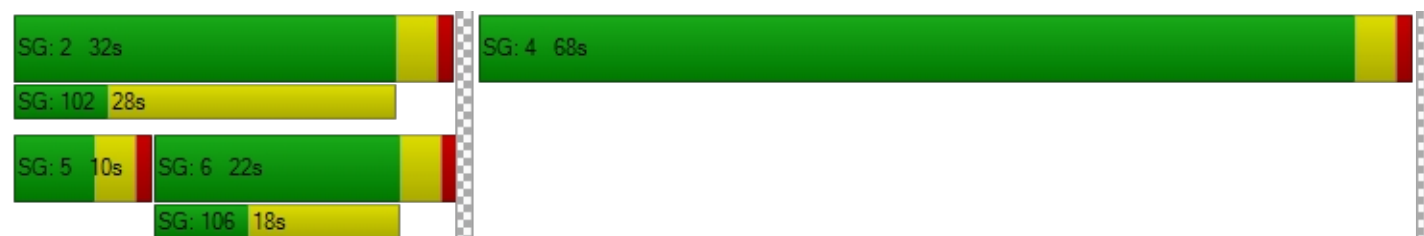
d_M, Delay for Movement [s/veh]	48.03	10.05	0.00	0.00	20.41	24.60	0.00	0.00	0.00	28.92	29.04	37.97
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	12.51			21.79			0.00			32.50		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	21.15											
Intersection LOS	C											
Intersection V/C	0.786											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.367			2.421		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.495			2.766			4.132			2.525		
Bicycle LOS	B			C			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.814

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	177	0	0	291	105	0	0	0	42	131	170
Total Analysis Volume [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.28	0.29		0.19	0.18	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	107	2874	1537	728		749	790	749
d1, Uniform Delay [s]	46.35	14.03	24.56	25.10		21.17	20.81	27.40
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.10	0.20	2.53	6.21		0.45	0.38	6.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.69	0.73		0.47	0.43	0.91
d, Delay for Lane Group [s/veh]	57.46	14.24	27.09	31.31		21.62	21.18	34.29
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.35	2.98	10.52	11.46		5.87	5.65	15.98
50th-Percentile Queue Length [ft/ln]	58.85	74.49	262.99	286.38		146.77	141.16	399.49
95th-Percentile Queue Length [veh/ln]	4.24	5.36	15.84	17.01		9.84	9.54	22.54
95th-Percentile Queue Length [ft/ln]	105.94	134.08	395.97	425.14		246.11	238.58	563.38

**Movement, Approach, & Intersection Results**

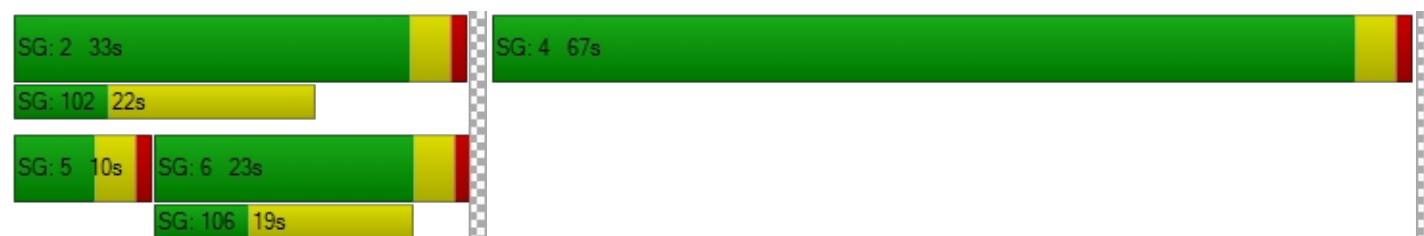
d_M, Delay for Movement [s/veh]	57.46	14.24	0.00	0.00	27.47	31.31	0.00	0.00	0.00	21.62	21.33	34.29
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	18.78			28.49			0.00			27.79		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	26.19											
Intersection LOS	C											
Intersection V/C	0.814											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.220			2.390		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	1.994			2.431			4.132			2.690		
Bicycle LOS	A			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	250	65	120	297	0	170	60	36	0	0	0
Total Analysis Volume [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	19	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	49	49	15	68	24	24	24	
g / C, Green / Cycle	0.49	0.49	0.15	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.14	0.14	0.21	0.19	0.13	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2815	889	527	3901	825	448	424	
d1, Uniform Delay [s]	15.54	14.95	41.80	6.29	36.26	33.44	31.78	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.35	0.83	6.39	0.20	2.16	1.00	0.48	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.29	0.91	0.30	0.82	0.54	0.34	
d, Delay for Lane Group [s/veh]	15.89	15.78	48.19	6.49	38.42	34.44	32.25	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.61	3.57	6.22	3.01	7.99	5.16	2.95	
50th-Percentile Queue Length [ft/ln]	115.16	89.19	155.42	75.24	199.76	129.12	73.75	
95th-Percentile Queue Length [veh/ln]	8.13	6.42	10.31	5.42	12.63	8.89	5.31	
95th-Percentile Queue Length [ft/ln]	203.16	160.54	257.64	135.43	315.66	222.30	132.74	

**Movement, Approach, & Intersection Results**

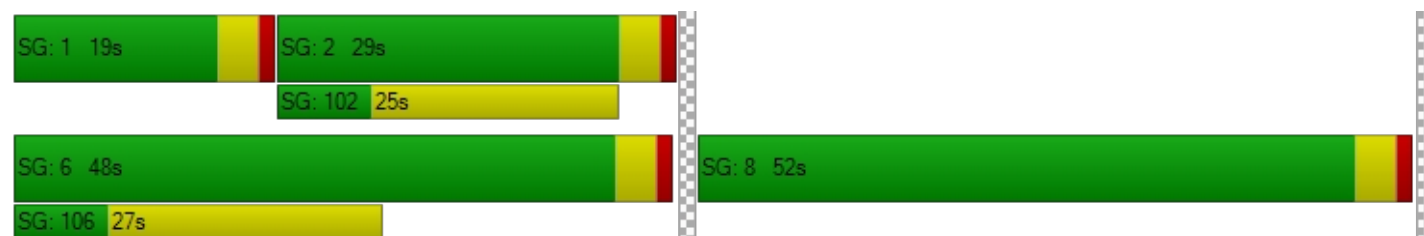
d_M, Delay for Movement [s/veh]	0.00	15.89	15.78	48.19	6.49	0.00	38.42	34.44	32.25	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	15.87			18.49			36.68			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.52											
Intersection LOS	C											
Intersection V/C	0.576											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.396			2.196		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			880			960			0		
d_b, Bicycle Delay [s]	28.13			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.252			2.475			3.317			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	144	44	155	192	0	53	183	14	0	0	0
Total Analysis Volume [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	27	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	38	38	20	62	30	30	30	
g / C, Green / Cycle	0.38	0.38	0.20	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.18	0.20	0.26	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1454	689	701	2367	535	565	535	
d1, Uniform Delay [s]	21.95	22.14	38.86	8.91	33.58	32.76	25.51	
k, delay calibration	0.50	0.50	0.11	0.50	0.15	0.12	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.48	3.94	0.36	7.03	3.45	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.34	0.36	0.88	0.32	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	22.60	23.62	42.81	9.27	40.62	36.21	25.60	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.24	4.42	7.67	3.76	11.81	10.85	0.99	
50th-Percentile Queue Length [ft/ln]	105.93	110.62	191.68	94.02	295.24	271.24	24.81	
95th-Percentile Queue Length [veh/ln]	7.61	7.87	12.21	6.77	17.45	16.25	1.79	
95th-Percentile Queue Length [ft/ln]	190.33	196.86	305.21	169.24	436.14	406.28	44.66	

**Movement, Approach, & Intersection Results**

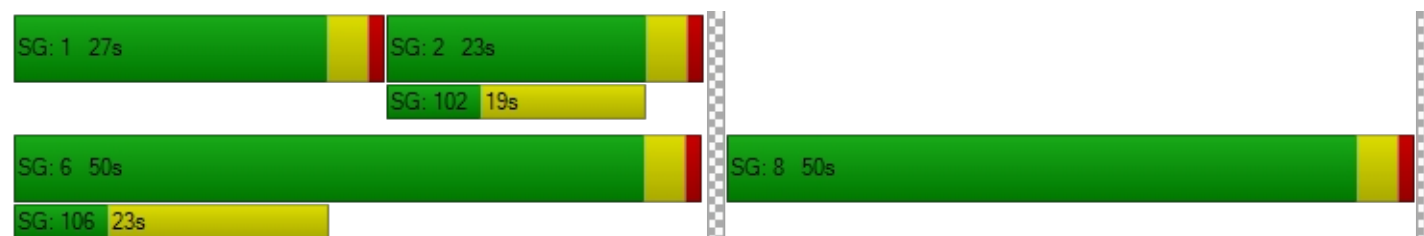
d_M, Delay for Movement [s/veh]	0.00	22.73	23.62	42.81	9.27	0.00	40.62	37.81	25.60	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.94			24.27			37.70			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.23											
Intersection LOS	C											
Intersection V/C	0.660											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.270			2.465		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			920			920			0		
d_b, Bicycle Delay [s]	32.81			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.972			2.703			2.385			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.316

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	248	253	36	5	438
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	248	253	36	5	438
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	62	63	9	1	110
Total Analysis Volume [veh/h]	0	248	253	36	5	438
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.32	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	11.68	0.00	0.00	7.84	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.36	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	33.91	0.00	0.00	0.30	0.00
d_A, Approach Delay [s/veh]	11.68		0.00		0.09	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.00					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.401

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	424	29	5	430	0	2	2	7	415	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	424	29	5	430	0	2	2	7	415	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	106	7	1	108	0	1	1	2	104	0	3
Total Analysis Volume [veh/h]	0	424	29	5	430	0	2	2	7	415	0	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	47	0	10	57	0	0	53	0	53	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	70	70	75	75	27	27	27	27
g / C, Green / Cycle	0.63	0.63	0.68	0.68	0.25	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.13	0.00	0.11	0.00	0.01	0.23	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1203	1140	1215	2578	480	481	473	448
d1, Uniform Delay [s]	8.40	8.46	5.70	6.41	31.05	31.17	40.31	31.21
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	0.39	0.00	0.14	0.00	0.02	5.36	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.20	0.00	0.17	0.00	0.02	0.88	0.02
d, Delay for Lane Group [s/veh]	8.74	8.85	5.71	6.55	31.06	31.19	45.67	31.23
Lane Group LOS	A	A	A	A	C	C	D	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.25	2.28	0.04	1.73	0.04	0.18	11.52	0.22
50th-Percentile Queue Length [ft/ln]	56.31	56.91	0.88	43.35	1.02	4.59	288.08	5.62
95th-Percentile Queue Length [veh/ln]	4.05	4.10	0.06	3.12	0.07	0.33	17.09	0.40
95th-Percentile Queue Length [ft/ln]	101.36	102.45	1.59	78.02	1.83	8.26	427.26	10.11

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	8.80	8.85	5.71	6.55	0.00	31.06	31.19	31.19	45.67	0.00	31.23
Movement LOS		A	A	A	A		C	C	C	D		C
d_A, Approach Delay [s/veh]	8.80			6.54			31.17			45.30		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	19.98											
Intersection LOS	B											
Intersection V/C	0.401											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.482			1.730			2.105		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			964			891			0		
d_b, Bicycle Delay [s]	20.40			14.77			16.91			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.933			1.918			1.578			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	72.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.367

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	50	175	465	0	199	396
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	175	465	0	199	396
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	44	116	0	50	99
Total Analysis Volume [veh/h]	50	175	465	0	199	396
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.37	0.66
d_M, Delay for Movement [s/veh]	8.44	0.00	0.00	0.00	72.62	72.00
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	16.07	16.07
95th-Percentile Queue Length [ft/ln]	3.58	0.00	0.00	0.00	401.66	401.66
d_A, Approach Delay [s/veh]	1.88		0.00		72.20	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	33.76					
Intersection LOS	F					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	85.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	76	220	827	0	0	378
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	220	827	0	0	378
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	55	207	0	0	95
Total Analysis Volume [veh/h]	76	220	827	0	0	378
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.09	0.00	0.01	0.00	0.00	1.02
d_M, Delay for Movement [s/veh]	9.94	0.00	0.00	0.00	85.42	85.38
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.31	0.00	0.00	0.00	12.32	12.32
95th-Percentile Queue Length [ft/ln]	7.80	0.00	0.00	0.00	308.02	308.02
d_A, Approach Delay [s/veh]	2.55		0.00		85.38	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	22.00					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	281	12	24	1185	11	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	281	12	24	1185	11	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	3	6	296	3	5
Total Analysis Volume [veh/h]	281	12	24	1185	11	21
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.01	0.04	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.89	0.00	19.97	10.41
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.23	0.23
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.45	0.00	5.77	5.77
d_A, Approach Delay [s/veh]	0.00		0.16		13.70	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.41					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.123

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	376	52	0	435	5	0	0	12	0	0	97
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	376	52	0	435	5	0	0	12	0	0	97
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	94	13	0	109	1	0	0	3	0	0	24
Total Analysis Volume [veh/h]	6	376	52	0	435	5	0	0	12	0	0	97
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.12
d_M, Delay for Movement [s/veh]	8.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.66	0.00	0.00	10.19
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.42
95th-Percentile Queue Length [ft/ln]	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	10.43
d_A, Approach Delay [s/veh]	0.11			0.00			9.66			10.19		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	1.17											
Intersection LOS	B											



*APPENDIX E-IV*

**EXISTING PLUS PROJECT WITH IMPROVEMENTS  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.265

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	48	13	15	55	7	4	44	21	41	60	15
Total Analysis Volume [veh/h]	203	192	51	61	220	27	16	176	83	162	238	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	8	8	8	8	8	8
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.13	0.13	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.09	0.13	0.03	0.03	0.14	0.01	0.09	0.05	0.09	0.08	0.08
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1286	1387	1317	1293	1317	179	257	243	161	257	243
d1, Uniform Delay [s]	2.38	2.47	2.22	2.24	2.50	22.67	24.76	23.55	24.67	24.50	24.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.25	0.06	0.07	0.32	0.21	3.24	0.83	34.94	2.38	2.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.16	0.04	0.05	0.19	0.09	0.69	0.34	1.01	0.61	0.58
d, Delay for Lane Group [s/veh]	2.59	2.73	2.28	2.31	2.82	22.88	28.00	24.38	59.61	26.88	26.59
Lane Group LOS	A	A	A	A	A	C	C	C	F	C	C
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.36	0.51	0.10	0.12	0.56	0.20	2.47	1.06	3.60	2.16	1.92
50th-Percentile Queue Length [ft/ln]	9.10	12.67	2.56	3.09	14.11	4.93	61.83	26.55	90.02	53.89	48.09
95th-Percentile Queue Length [veh/ln]	0.66	0.91	0.18	0.22	1.02	0.36	4.45	1.91	6.48	3.88	3.46
95th-Percentile Queue Length [ft/ln]	16.38	22.81	4.61	5.57	25.39	8.88	111.29	47.78	162.03	97.00	86.56

**Movement, Approach, & Intersection Results**

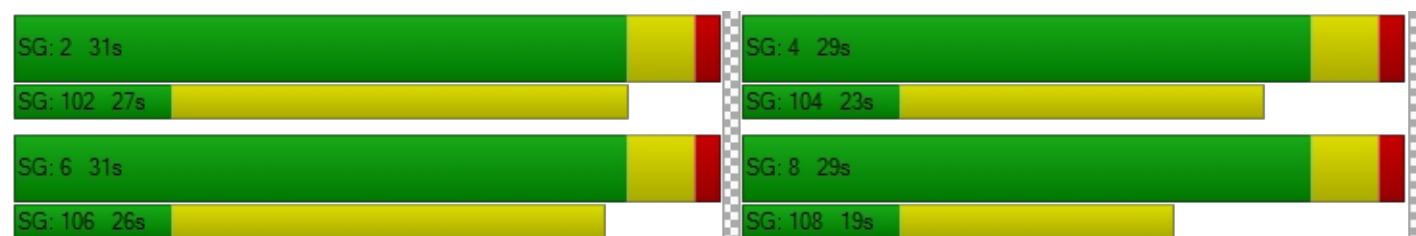
d_M, Delay for Movement [s/veh]	2.60	2.73	2.28	2.31	2.82	2.82	22.88	28.00	24.38	59.61	26.78	26.59
Movement LOS	A	A	A	A	A	A	C	C	C	F	C	C
d_A, Approach Delay [s/veh]	2.63			2.72			26.61			38.29		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	18.11											
Intersection LOS	B											
Intersection V/C	0.265											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.01			20.01			20.01			20.01		
I_p,int, Pedestrian LOS Score for Intersection	2.561			2.128			2.754			2.378		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	900			900			833			833		
d_b, Bicycle Delay [s]	9.08			9.08			10.21			10.21		
I_b,int, Bicycle LOS Score for Intersection	2.296			2.068			2.013			1.940		
Bicycle LOS	B			B			B			A		

**Sequence**




Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	16.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	50	175	465	0	199	396
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	175	465	0	199	396
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	44	116	0	50	99
Total Analysis Volume [veh/h]	50	175	465	0	199	396
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	22
g / C, Green / Cycle	0.49	0.49	0.49	0.37
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.26	0.33
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	629	935	886	675
d1, Uniform Delay [s]	7.99	8.55	10.47	17.59
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	0.44	2.22	4.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.19	0.52	0.88
d, Delay for Lane Group [s/veh]	8.23	8.99	12.69	21.58
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.33	1.19	4.05	7.48
50th-Percentile Queue Length [ft/ln]	8.26	29.78	101.19	186.96
95th-Percentile Queue Length [veh/ln]	0.59	2.14	7.29	11.96
95th-Percentile Queue Length [ft/ln]	14.87	53.61	182.13	299.09



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	8.23	8.99	12.69	12.69	21.58	21.58
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	8.82		12.69		21.58	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	16.13					
Intersection LOS	B					
Intersection V/C	0.679					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.504	4.900	5.114
Bicycle LOS	E	E	F

**Sequence**




Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.772

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	76	220	827	0	0	378
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	220	827	0	0	378
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	55	207	0	0	95
Total Analysis Volume [veh/h]	76	220	827	0	0	378
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	15
g / C, Green / Cycle	0.62	0.62	0.62	0.25
(v / s)_i Volume / Saturation Flow Rate	0.04	0.12	0.46	0.21
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	566	1168	1107	454
d1, Uniform Delay [s]	4.65	5.04	8.24	21.29
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	0.36	4.62	4.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.19	0.75	0.83
d, Delay for Lane Group [s/veh]	5.14	5.40	12.86	25.36
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.36	0.99	6.82	5.11
50th-Percentile Queue Length [ft/ln]	8.94	24.85	170.47	127.76
95th-Percentile Queue Length [veh/ln]	0.64	1.79	11.10	8.82
95th-Percentile Queue Length [ft/ln]	16.09	44.73	277.54	220.44

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.14	5.40	12.86	12.86	25.36	25.36
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	5.33		12.86		25.36	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	14.52					
Intersection LOS	B					
Intersection V/C	0.772					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.621	5.497	4.756
Bicycle LOS	E	F	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## APPENDIX F

### YEAR 2020 CUMULATIVE TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS





*APPENDIX F-1*

**YEAR 2020 CUMULATIVE WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	58.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.820

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	304	1309	215	338	1013	399	286	1275	176	194	1138	335
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	304	1309	215	338	1013	399	286	1275	176	194	1138	335
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	327	54	85	253	100	72	319	44	49	285	84
Total Analysis Volume [veh/h]	304	1309	215	338	1013	399	286	1275	176	194	1138	335
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	42	0	11	38	0	15	46	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	46	46	7	42	42	11	34	34	7	30	30
g / C, Green / Cycle	0.10	0.42	0.42	0.06	0.38	0.38	0.10	0.31	0.31	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.23	0.12	0.10	0.26	0.25	0.16	0.26	0.27	0.06	0.20	0.19
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	354	2391	755	228	1457	690	182	1159	549	228	1534	484
d1, Uniform Delay [s]	48.75	24.11	21.09	51.51	28.13	27.76	49.53	35.74	36.29	50.98	36.78	36.17
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.24	0.11	0.11	0.12
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.09	0.91	0.95	222.16	2.42	4.52	264.45	1.69	9.51	8.62	0.72	1.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.86	0.55	0.28	1.48	0.67	0.64	1.57	0.84	0.87	0.85	0.74	0.69
d, Delay for Lane Group [s/veh]	54.84	25.01	22.04	273.67	30.55	32.28	313.97	37.43	45.80	59.60	37.51	38.16
Lane Group LOS	D	C	C	F	C	C	F	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.40	8.60	3.82	10.17	10.87	10.20	18.36	12.25	13.47	2.92	9.33	8.28
50th-Percentile Queue Length [ft/ln]	109.95	215.05	95.50	254.34	271.79	255.02	459.11	306.23	336.85	72.88	233.31	207.07
95th-Percentile Queue Length [veh/ln]	7.84	13.41	6.88	17.13	16.28	15.44	29.35	17.99	19.49	5.25	14.34	13.00
95th-Percentile Queue Length [ft/ln]	195.94	335.29	171.90	428.13	406.98	385.96	733.74	449.73	487.35	131.19	358.56	325.07

**Movement, Approach, & Intersection Results**

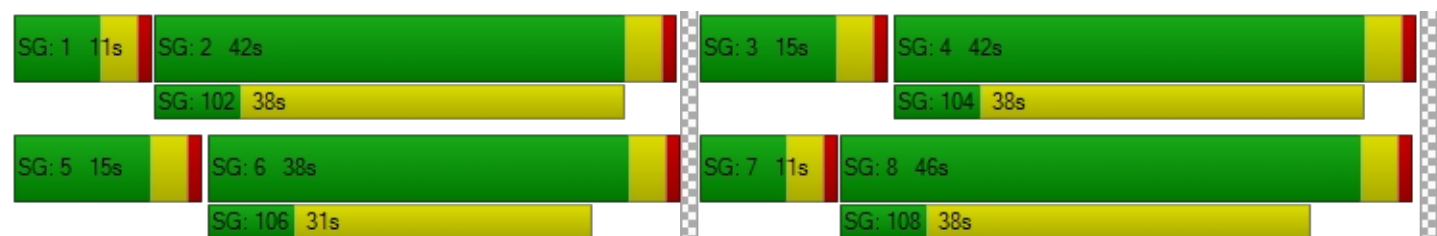
d_M, Delay for Movement [s/veh]	54.84	25.01	22.04	273.67	30.62	32.28	313.97	39.43	45.80	59.60	37.51	38.16
Movement LOS	D	C	C	F	C	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	29.62			77.94			85.28			40.21		
Approach LOS	C			E			F			D		
d_I, Intersection Delay [s/veh]	58.11											
Intersection LOS	E											
Intersection V/C	0.820											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.207			3.184			3.102			3.237		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			764			691		
d_b, Bicycle Delay [s]	23.56			26.25			21.02			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.565			2.522			2.515			2.476		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.702

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	27	1449	620	98	1280	69	104	194	37	561	116	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1449	620	98	1280	69	104	194	37	561	116	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	362	155	25	320	17	26	49	9	140	29	0
Total Analysis Volume [veh/h]	27	1449	620	98	1280	69	104	194	37	561	116	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	11	34	0	0	16	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	49	7	53	53	14	14	14	24	24
g / C, Green / Cycle	0.03	0.45	0.06	0.48	0.48	0.12	0.12	0.12	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.05	0.29	0.14	0.06	0.10	0.02	0.19	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	57	2557	116	1829	866	225	237	225	390	390
d1, Uniform Delay [s]	52.40	22.45	50.96	20.77	17.30	44.74	46.95	43.04	41.53	41.66
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.98	0.92	15.09	1.44	0.88	1.48	6.77	0.34	5.68	6.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.57	0.85	0.60	0.30	0.46	0.82	0.16	0.86	0.87
d, Delay for Lane Group [s/veh]	58.38	23.36	66.05	22.21	18.19	46.22	53.71	43.38	47.21	47.87
Lane Group LOS	E	C	E	C	B	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.83	9.25	3.15	10.26	4.13	2.73	5.60	0.92	9.32	9.53
50th-Percentile Queue Length [ft/ln]	20.69	231.21	78.81	256.39	103.19	68.19	140.12	23.08	233.09	238.28
95th-Percentile Queue Length [veh/ln]	1.49	14.24	5.67	15.51	7.43	4.91	9.49	1.66	14.33	14.59
95th-Percentile Queue Length [ft/ln]	37.24	355.90	141.86	387.69	185.75	122.75	237.19	41.54	358.28	364.86

**Movement, Approach, & Intersection Results**

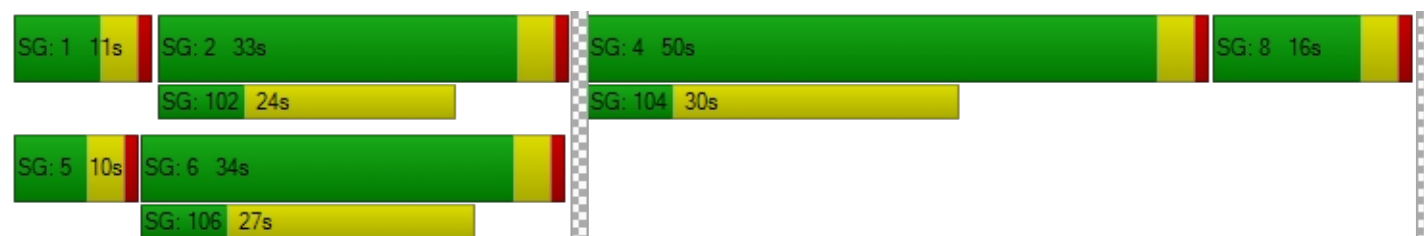
d_M, Delay for Movement [s/veh]	58.38	23.36	0.00	66.05	21.61	18.19	46.22	53.71	43.38	47.47	47.87	0.00
Movement LOS	E	C		E	C	B	D	D	D	D	D	
d_A, Approach Delay [s/veh]	24.00			24.46			50.25			47.54		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.45											
Intersection LOS	C											
Intersection V/C	0.702											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			3.021			2.274			2.265		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			545			218			836		
d_b, Bicycle Delay [s]	29.82			29.09			43.65			18.62		
I_b,int, Bicycle LOS Score for Intersection	2.371			2.355			2.112			2.677		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.901

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	82	1411	30	436	1355	38	41	195	129	62	265	619
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1411	30	436	1355	38	41	195	129	62	265	619
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	353	8	109	339	10	10	49	32	16	66	155
Total Analysis Volume [veh/h]	82	1411	30	436	1355	38	41	195	129	62	265	619
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	50	50	16	59	59	32	32	32	32	32	52
g / C, Green / Cycle	0.06	0.45	0.45	0.15	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.48
(v / s)_i Volume / Saturation Flow Rate	0.05	0.39	0.39	0.12	0.36	0.02	0.02	0.10	0.07	0.03	0.14	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	856	811	513	2054	973	352	559	529	412	559	858
d1, Uniform Delay [s]	51.30	27.25	27.16	45.74	18.03	11.85	28.04	30.53	29.51	28.37	31.84	22.92
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	14.08	11.51	11.72	4.06	1.68	0.08	0.15	0.37	0.24	0.17	0.63	5.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.87	0.86	0.85	0.66	0.04	0.12	0.35	0.24	0.15	0.47	0.72
d, Delay for Lane Group [s/veh]	65.37	38.76	38.88	49.79	19.71	11.93	28.18	30.90	29.75	28.54	32.46	28.13
Lane Group LOS	E	D	D	D	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.63	19.66	18.54	6.07	12.21	0.45	0.80	4.11	2.63	1.22	5.84	13.59
50th-Percentile Queue Length [ft/ln]	65.68	491.55	463.52	151.68	305.27	11.32	19.93	102.83	65.70	30.44	146.11	339.80
95th-Percentile Queue Length [veh/ln]	4.73	26.93	25.60	10.11	17.94	0.82	1.44	7.40	4.73	2.19	9.81	19.64
95th-Percentile Queue Length [ft/ln]	118.22	673.35	640.06	252.67	448.54	20.38	35.88	185.09	118.26	54.78	245.22	490.95

**Movement, Approach, & Intersection Results**

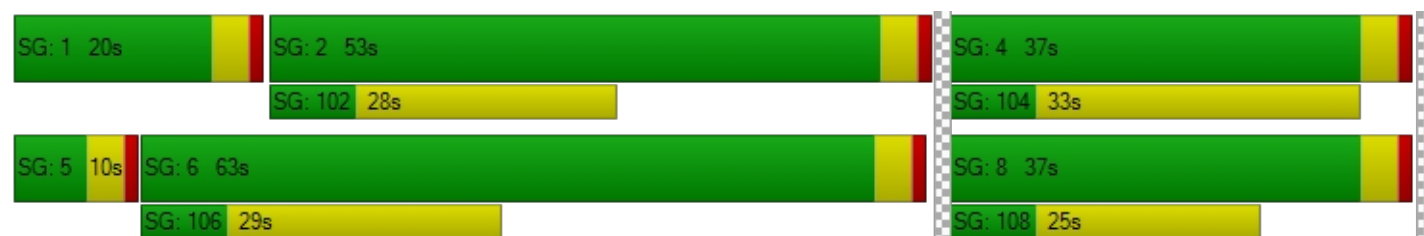
d_M, Delay for Movement [s/veh]	65.37	38.82	38.88	49.79	19.71	11.93	28.18	30.90	29.75	28.54	32.46	28.13
Movement LOS	E	D	D	D	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	40.25			26.72			30.19			29.37		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	31.95											
Intersection LOS	C											
Intersection V/C	0.901											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.996			3.205			2.323			2.623		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.816			3.069			2.162			3.121		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	39.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	454	432	124	117	300	19	23	354	293	84	499	147
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	454	432	124	117	300	19	23	354	293	84	499	147
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	108	31	29	75	5	6	89	73	21	125	37
Total Analysis Volume [veh/h]	454	432	124	117	300	19	23	354	293	84	499	147
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	43	0	0	33	0	0	34	34	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	37	23	23	64	23	23	23
g / C, Green / Cycle	0.34	0.34	0.34	0.34	0.34	0.21	0.21	0.59	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.25	0.25	0.07	0.07	0.18	0.01	0.19	0.16	0.05	0.18	0.17
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	613	613	613	613	613	109	399	1056	96	399	378
d1, Uniform Delay [s]	31.67	31.67	25.64	25.54	29.02	34.69	42.09	11.19	35.93	41.83	41.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.22	0.50	0.11	0.20	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.25	7.25	0.74	0.69	3.15	0.96	12.40	0.65	20.46	9.94	5.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.72	0.72	0.20	0.19	0.52	0.21	0.89	0.28	0.87	0.86	0.80
d, Delay for Lane Group [s/veh]	38.92	38.92	26.39	26.23	32.17	35.65	54.49	11.85	56.38	51.77	47.06
Lane Group LOS	D	D	C	C	C	D	D	B	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	11.37	11.37	2.42	2.28	7.22	0.52	10.61	3.60	2.42	10.03	8.32
50th-Percentile Queue Length [ft/ln]	284.22	284.22	60.59	56.90	180.56	13.09	265.23	89.90	60.43	250.63	207.93
95th-Percentile Queue Length [veh/ln]	16.90	16.90	4.36	4.10	11.63	0.94	15.95	6.47	4.35	15.22	13.05
95th-Percentile Queue Length [ft/ln]	422.46	422.46	109.06	102.42	290.74	23.56	398.78	161.82	108.77	380.44	326.18

**Movement, Approach, & Intersection Results**

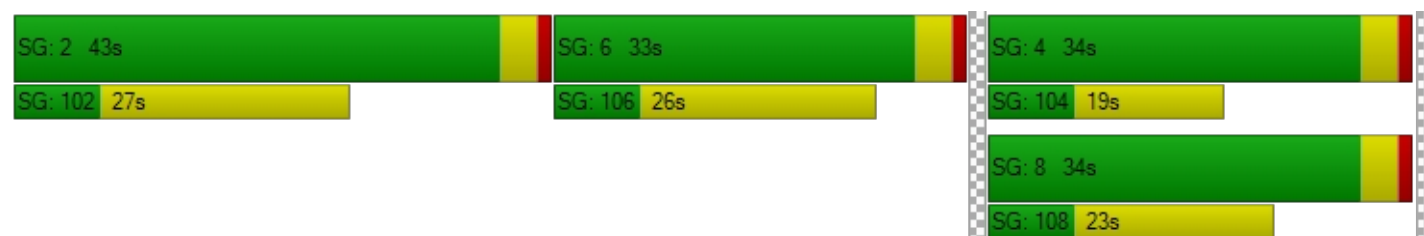
d_M, Delay for Movement [s/veh]	38.92	38.92	26.39	26.23	32.17	32.17	35.65	54.49	11.85	56.38	50.31	47.06
Movement LOS	D	D	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	37.39			30.57			35.20			50.35		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	39.15											
Intersection LOS	D											
Intersection V/C	0.684											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.671			2.320			2.630			2.464		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			527			545			545		
d_b, Bicycle Delay [s]	22.91			29.82			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	3.226			2.279			2.665			2.162		
Bicycle LOS	C			B			B			B		

**Sequence**



Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.410

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	28	236	180	411	474	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	236	180	411	474	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	59	45	103	119	6
Total Analysis Volume [veh/h]	28	236	180	411	474	23
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	46	46	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	85	85	85	85
g / C, Green / Cycle	0.15	0.15	0.78	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.10	0.22	0.25	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	272	272	1275	1474	1474	1396
d1, Uniform Delay [s]	40.11	45.45	3.07	3.52	3.68	2.80
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.13	0.23	0.47	0.58	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.87	0.14	0.28	0.32	0.02
d, Delay for Lane Group [s/veh]	40.28	53.58	3.30	3.99	4.25	2.82
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.67	6.86	0.88	2.28	2.75	0.10
50th-Percentile Queue Length [ft/ln]	16.66	171.51	21.92	56.91	68.64	2.52
95th-Percentile Queue Length [veh/ln]	1.20	11.16	1.58	4.10	4.94	0.18
95th-Percentile Queue Length [ft/ln]	29.98	278.90	39.45	102.44	123.55	4.54

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	40.28	53.58	3.30	3.99	4.25	2.82
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	52.17		3.78		4.19	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.38					
Intersection LOS	B					
Intersection V/C	0.410					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.358	2.373	2.254
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.108	4.952
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 64s

SG: 101 26s

SG: 4 46s



SG: 104 21s

SG: 8 46s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.859

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	192	1263	103	143	1142	29	53	609	178	162	822	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	1263	103	143	1142	29	53	609	178	162	822	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	316	26	36	286	7	13	152	45	41	206	61
Total Analysis Volume [veh/h]	192	1263	103	143	1142	29	53	609	178	162	822	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	47	47	45	35	35	45	37	37
g / C, Green / Cycle	0.51	0.42	0.42	0.51	0.42	0.42	0.41	0.32	0.32	0.41	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.37	0.37	0.08	0.32	0.32	0.03	0.22	0.20	0.09	0.30	0.28
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	526	802	759	393	802	759	331	612	580	494	632	599
d1, Uniform Delay [s]	14.58	29.31	29.02	14.15	26.97	26.87	19.49	32.48	31.78	20.79	34.93	33.86
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.15	0.12
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.95	13.45	12.76	0.57	6.47	6.62	0.22	1.38	1.15	0.38	6.60	3.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.88	0.87	0.36	0.75	0.75	0.16	0.69	0.63	0.33	0.90	0.83
d, Delay for Lane Group [s/veh]	16.53	42.76	41.78	14.72	33.44	33.49	19.72	33.85	32.93	21.17	41.53	37.25
Lane Group LOS	B	D	D	B	C	C	B	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.86	19.63	18.02	1.92	14.50	13.62	0.84	9.86	8.41	2.73	15.31	12.60
50th-Percentile Queue Length [ft/ln]	71.43	490.69	450.47	48.02	362.43	340.59	21.07	246.40	210.34	68.32	382.81	314.94
95th-Percentile Queue Length [veh/ln]	5.14	26.89	24.98	3.46	20.74	19.68	1.52	15.00	13.17	4.92	21.73	18.42
95th-Percentile Queue Length [ft/ln]	128.58	672.33	624.51	86.43	518.53	491.92	37.93	375.12	329.26	122.98	543.24	460.46

**Movement, Approach, & Intersection Results**

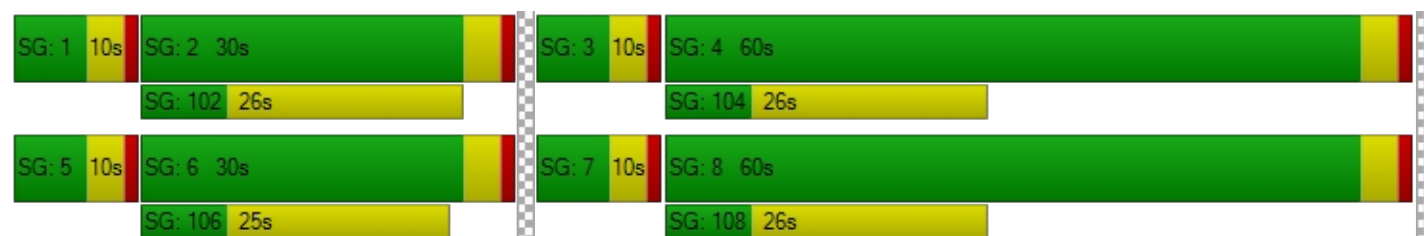
d_M, Delay for Movement [s/veh]	16.53	42.33	41.78	14.72	33.46	33.49	19.72	33.57	32.93	21.17	40.20	37.25
Movement LOS	B	D	D	B	C	C	B	C	C	C	D	D
d_A, Approach Delay [s/veh]	39.11			31.42			32.56			37.10		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	35.45											
Intersection LOS	D											
Intersection V/C	0.859											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.981			2.896			2.797			2.805		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.845			2.644			2.253			2.571		
Bicycle LOS	C			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.866

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	113	1094	123	125	938	108	248	715	104	205	1035	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	113	1094	123	125	938	108	248	715	104	205	1035	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	274	31	31	235	27	62	179	26	51	259	39
Total Analysis Volume [veh/h]	113	1094	123	125	938	108	248	715	104	205	1035	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	37	0	10	37	0	18	48	0	15	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	52	42	42	52	42	42	50	36	36	50	34	34
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.38	0.38	0.45	0.33	0.33	0.45	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.33	0.32	0.07	0.29	0.28	0.14	0.23	0.22	0.11	0.27	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	490	724	686	379	727	689	448	625	592	558	1181	560
d1, Uniform Delay [s]	16.34	31.68	31.19	16.45	29.46	29.04	18.98	32.05	31.64	18.47	35.93	28.64
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.13	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	14.11	12.50	0.50	7.05	6.55	1.07	1.65	1.31	0.40	2.24	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.88	0.85	0.33	0.75	0.73	0.55	0.69	0.66	0.37	0.88	0.28
d, Delay for Lane Group [s/veh]	17.43	45.79	43.69	16.96	36.51	35.60	20.05	33.70	32.95	18.87	38.17	28.91
Lane Group LOS	B	D	D	B	D	D	C	C	C	B	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.74	18.10	16.17	1.83	13.67	12.29	4.10	10.08	8.97	3.25	13.30	3.17
50th-Percentile Queue Length [ft/ln]	43.60	452.44	404.28	45.74	341.81	307.26	102.55	252.11	224.21	81.37	332.47	79.24
95th-Percentile Queue Length [veh/ln]	3.14	25.07	22.77	3.29	19.74	18.04	7.38	15.29	13.88	5.86	19.28	5.71
95th-Percentile Queue Length [ft/ln]	78.48	626.86	569.15	82.33	493.42	450.99	184.58	382.31	346.99	146.46	481.98	142.63

**Movement, Approach, & Intersection Results**

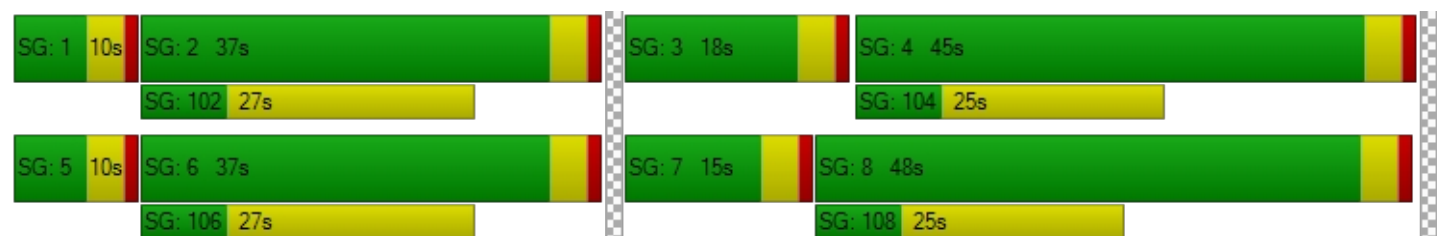
d_M, Delay for Movement [s/veh]	17.43	44.91	43.69	16.96	36.13	35.60	20.05	33.40	32.95	18.87	38.17	28.91
Movement LOS	B	D	D	B	D	D	C	C	C	B	D	C
d_A, Approach Delay [s/veh]	42.46			34.03			30.26			34.30		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	35.55											
Intersection LOS	D											
Intersection V/C	0.866											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.913			2.946			2.827			2.917		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			600			800			745		
d_b, Bicycle Delay [s]	26.95			26.95			19.80			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.657			2.526			2.440			2.712		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	153	856	142	83	616	127	150	793	127	287	1160	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	153	856	142	83	616	127	150	793	127	287	1160	122
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	214	36	21	154	32	38	198	32	72	290	31
Total Analysis Volume [veh/h]	153	856	142	83	616	127	150	793	127	287	1160	122
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	35	0	10	30	0	15	50	0	15	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	40	40	49	38	38	11	38	38	11	38	38
g / C, Green / Cycle	0.45	0.36	0.36	0.45	0.34	0.34	0.10	0.34	0.34	0.10	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.09	0.23	0.08	0.05	0.21	0.19	0.08	0.25	0.24	0.08	0.31	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	596	1374	651	569	651	616	180	651	616	348	1300	616
d1, Uniform Delay [s]	18.26	28.96	24.35	17.52	30.01	29.56	48.67	31.94	31.42	48.63	34.29	25.56
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.17	0.15	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.04	2.14	0.77	0.12	4.12	3.77	9.71	2.73	2.12	4.93	2.36	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.26	0.62	0.22	0.15	0.60	0.57	0.84	0.74	0.71	0.82	0.89	0.20
d, Delay for Lane Group [s/veh]	19.30	31.09	25.12	17.63	34.13	33.33	58.38	34.67	33.53	53.56	36.65	25.71
Lane Group LOS	B	C	C	B	C	C	E	C	C	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.50	9.58	2.70	1.23	9.26	8.12	4.52	11.67	10.27	4.09	14.81	2.28
50th-Percentile Queue Length [ft/ln]	62.61	239.58	67.49	30.80	231.52	203.10	112.93	291.75	256.85	102.31	370.18	57.03
95th-Percentile Queue Length [veh/ln]	4.51	14.66	4.86	2.22	14.25	12.80	8.00	17.27	15.53	7.37	21.12	4.11
95th-Percentile Queue Length [ft/ln]	112.71	366.50	121.48	55.44	356.29	319.96	200.07	431.81	388.26	184.16	527.95	102.65

**Movement, Approach, & Intersection Results**

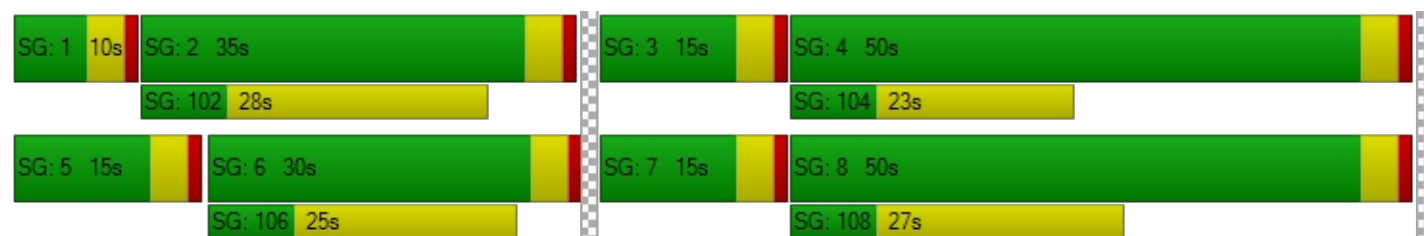
d_M, Delay for Movement [s/veh]	19.30	31.09	25.12	17.63	33.84	33.33	58.38	34.23	33.53	53.56	36.65	25.71
Movement LOS	B	C	C	B	C	C	E	C	C	D	D	C
d_A, Approach Delay [s/veh]	28.79			32.13			37.53			38.90		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.85											
Intersection LOS	C											
Intersection V/C	0.760											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.817			2.690			2.877			3.009		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			473			836			836		
d_b, Bicycle Delay [s]	28.37			32.07			18.62			18.62		
I_b,int, Bicycle LOS Score for Intersection	2.509			2.241			2.442			2.854		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.625

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	11	63	44	455	62	88	58	920	13	53	1449	455
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	63	44	455	62	88	58	920	13	53	1449	455
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	11	114	16	22	15	230	3	13	362	114
Total Analysis Volume [veh/h]	11	63	44	455	62	88	58	920	13	53	1449	455
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	19	28	74	74	74	65	65	87
g / C, Green / Cycle	0.05	0.05	0.05	0.17	0.26	0.67	0.67	0.67	0.59	0.59	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.02	0.13	0.08	0.03	0.25	0.25	0.03	0.38	0.25
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	102	96	590	465	829	1271	1204	878	2229	1425
d1, Uniform Delay [s]	49.60	50.99	50.53	43.71	33.00	6.24	8.08	8.06	9.69	15.19	3.19
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	6.03	3.35	2.17	0.40	0.04	0.86	0.90	0.13	1.49	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.62	0.46	0.77	0.32	0.07	0.38	0.38	0.06	0.65	0.32
d, Delay for Lane Group [s/veh]	50.77	57.02	53.89	45.88	33.40	6.27	8.94	8.96	9.82	16.68	3.32
Lane Group LOS	D	E	D	D	C	A	A	A	A	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.31	1.87	1.26	6.07	3.29	0.44	4.95	4.67	0.56	11.86	2.16
50th-Percentile Queue Length [ft/ln]	7.75	46.69	31.62	151.71	82.23	11.03	123.73	116.81	14.09	296.38	54.07
95th-Percentile Queue Length [veh/ln]	0.56	3.36	2.28	10.11	5.92	0.79	8.60	8.22	1.01	17.50	3.89
95th-Percentile Queue Length [ft/ln]	13.94	84.04	56.91	252.71	148.02	19.86	214.94	205.44	25.36	437.54	97.32

**Movement, Approach, & Intersection Results**

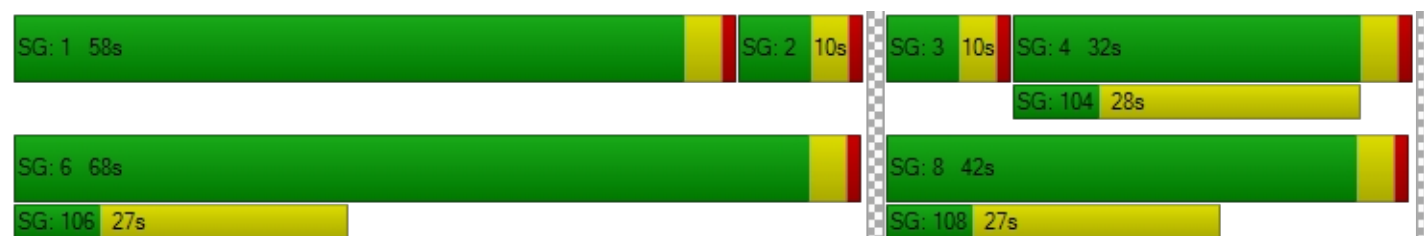
d_M, Delay for Movement [s/veh]	50.77	57.02	53.89	45.88	33.40	33.40	6.27	8.95	8.96	9.82	16.68	3.32
Movement LOS	D	E	D	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	55.27			42.78			8.79			13.39		
Approach LOS	E			D			A			B		
d_I, Intersection Delay [s/veh]	18.34											
Intersection LOS	B											
Intersection V/C	0.625											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.276			2.478			2.820			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.754			2.558			2.377			3.174		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.793

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	289	273	235	66	165	63	60	1105	141	192	1583	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	289	273	235	66	165	63	60	1105	141	192	1583	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	68	59	17	41	16	15	276	35	48	396	27
Total Analysis Volume [veh/h]	289	273	235	66	165	63	60	1105	141	192	1583	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	40	0	10	30	0	12	46	0	14	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	20	20	29	9	9	73	62	62	73	64	64
g / C, Green / Cycle	0.27	0.18	0.18	0.27	0.09	0.09	0.66	0.56	0.56	0.66	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.13	0.04	0.06	0.06	0.03	0.34	0.33	0.11	0.46	0.46
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	474	349	330	335	163	155	619	1063	1007	852	1095	1038
d1, Uniform Delay [s]	35.14	42.86	42.22	30.62	49.10	48.94	6.61	16.25	15.96	7.15	18.20	18.16
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.27	3.88	2.84	0.28	6.29	5.59	0.07	2.64	2.54	0.61	5.94	6.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.61	0.78	0.71	0.20	0.74	0.70	0.10	0.61	0.59	0.23	0.79	0.79
d, Delay for Lane Group [s/veh]	36.41	46.74	45.06	30.91	55.39	54.53	6.68	18.89	18.50	7.76	24.14	24.33
Lane Group LOS	D	D	D	C	E	D	A	B	B	A	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.88	7.41	6.23	1.36	3.50	3.12	0.48	11.23	10.09	1.76	17.89	16.93
50th-Percentile Queue Length [ft/ln]	172.08	185.36	155.71	34.07	87.41	78.01	11.95	280.76	252.17	44.02	447.17	423.27
95th-Percentile Queue Length [veh/ln]	11.19	11.88	10.32	2.45	6.29	5.62	0.86	16.73	15.30	3.17	24.82	23.68
95th-Percentile Queue Length [ft/ln]	279.64	297.00	258.04	61.33	157.34	140.42	21.51	418.16	382.38	79.23	620.57	591.97

**Movement, Approach, & Intersection Results**

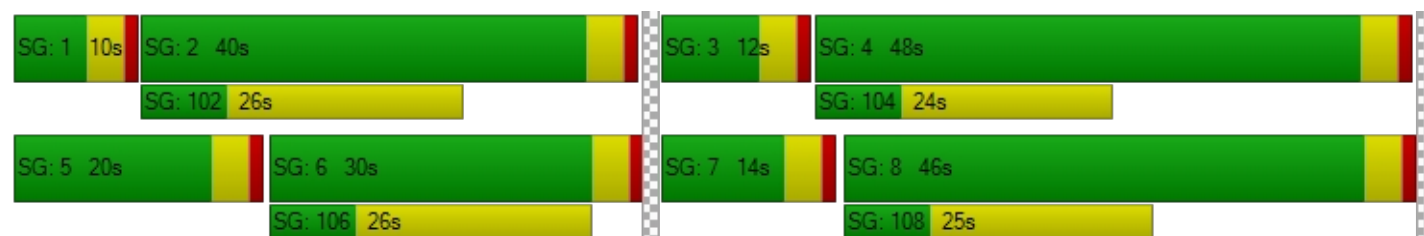
d_M, Delay for Movement [s/veh]	36.41	46.74	45.06	30.91	55.15	54.53	6.68	18.73	18.50	7.76	24.22	24.33
Movement LOS	D	D	D	C	E	D	A	B	B	A	C	C
d_A, Approach Delay [s/veh]	42.50			49.58			18.15			22.55		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	26.78											
Intersection LOS	C											
Intersection V/C	0.793											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.720			2.370			2.984			2.969		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			473			764			800		
d_b, Bicycle Delay [s]	24.89			32.07			21.02			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.875			1.802			2.637			3.112		
Bicycle LOS	C			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	246	208	56	120	73	49	1281	93	114	1552	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	246	208	56	120	73	49	1281	93	114	1552	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	62	52	14	30	18	12	320	23	29	388	14
Total Analysis Volume [veh/h]	89	246	208	56	120	73	49	1281	93	114	1552	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	63	0	0	63	0	24	37	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	85	75	75	85	76	76
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.16	0.77	0.68	0.68	0.77	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.12	0.03	0.11	0.03	0.37	0.37	0.06	0.44	0.43
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	132	295	279	89	279	1044	1296	1228	1127	1316	1247
d1, Uniform Delay [s]	41.29	45.08	44.37	40.51	43.96	2.94	8.90	8.80	3.05	9.20	9.17
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.83	6.14	3.93	7.08	3.05	0.02	1.68	1.70	0.18	2.28	2.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.67	0.83	0.74	0.63	0.69	0.05	0.55	0.54	0.10	0.63	0.63
d, Delay for Lane Group [s/veh]	47.12	51.23	48.30	47.58	47.01	2.95	10.58	10.50	3.23	11.49	11.54
Lane Group LOS	D	D	D	D	D	A	B	B	A	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.36	6.98	5.70	1.50	5.19	0.21	8.37	7.72	0.55	10.34	9.75
50th-Percentile Queue Length [ft/ln]	59.01	174.54	142.41	37.51	129.81	5.27	209.34	192.93	13.82	258.55	243.77
95th-Percentile Queue Length [veh/ln]	4.25	11.32	9.61	2.70	8.93	0.38	13.12	12.27	0.99	15.62	14.87
95th-Percentile Queue Length [ft/ln]	106.23	282.88	240.27	67.51	223.24	9.49	327.98	306.82	24.87	390.41	371.80

**Movement, Approach, & Intersection Results**

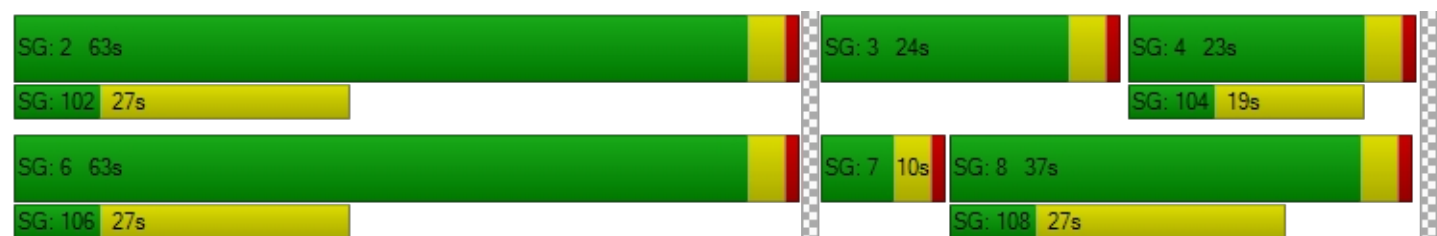
d_M, Delay for Movement [s/veh]	47.12	51.23	48.30	47.58	47.01	47.01	2.95	10.54	10.50	3.23	11.51	11.54
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	49.43			47.14			10.28			10.96		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	18.31											
Intersection LOS	B											
Intersection V/C	0.643											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.466			2.194			3.048			3.026		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1073			1073			600			345		
d_b, Bicycle Delay [s]	11.82			11.82			26.95			37.64		
I_b,int, Bicycle LOS Score for Intersection	2.456			1.970			2.734			2.979		
Bicycle LOS	B			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.836

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	85	409	69	317	394	552	447	888	53	126	1075	279
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	409	69	317	394	552	447	888	53	126	1075	279
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	102	17	79	99	138	112	222	13	32	269	70
Total Analysis Volume [veh/h]	85	409	69	317	394	552	447	888	53	126	1075	279
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	15	38	38	20	45	0	16	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	33	33	11	37	57	16	41	41	9	34	34
g / C, Green / Cycle	0.06	0.30	0.30	0.10	0.34	0.52	0.15	0.37	0.37	0.09	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.04	0.09	0.10	0.31	0.13	0.23	0.03	0.07	0.28	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	109	1132	536	352	1284	936	510	1405	665	155	1179	558
d1, Uniform Delay [s]	50.96	30.40	28.21	48.97	26.94	18.30	46.05	28.54	22.53	49.41	36.52	30.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.11	0.90	0.49	8.41	0.62	2.73	4.94	0.47	0.05	9.61	3.16	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.78	0.36	0.13	0.90	0.31	0.59	0.88	0.63	0.08	0.81	0.91	0.50
d, Delay for Lane Group [s/veh]	62.08	31.30	28.70	57.38	27.56	21.03	50.99	29.01	22.58	59.02	39.68	31.69
Lane Group LOS	E	C	C	E	C	C	D	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.64	4.40	1.41	4.70	3.92	10.10	6.30	9.58	0.90	3.81	14.15	6.11
50th-Percentile Queue Length [ft/ln]	66.08	109.93	35.16	117.56	98.12	252.39	157.58	239.39	22.58	95.24	353.78	152.84
95th-Percentile Queue Length [veh/ln]	4.76	7.84	2.53	8.26	7.06	15.31	10.42	14.65	1.63	6.86	20.32	10.17
95th-Percentile Queue Length [ft/ln]	118.94	195.91	63.29	206.46	176.61	382.66	260.51	366.26	40.64	171.43	508.01	254.21

**Movement, Approach, & Intersection Results**

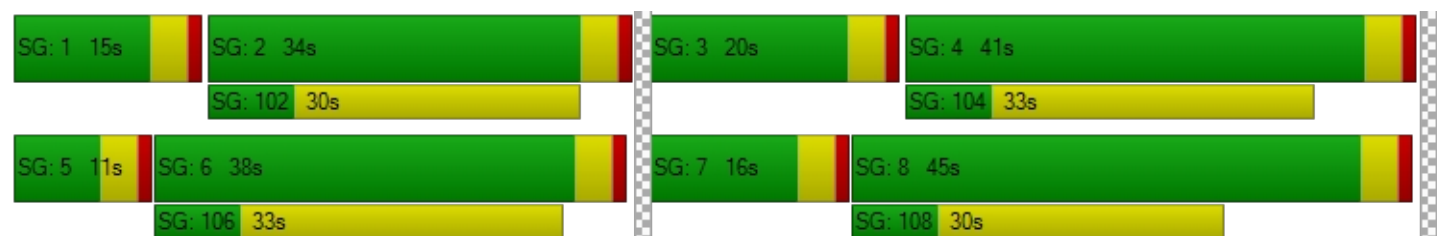
d_M, Delay for Movement [s/veh]	62.08	31.30	28.70	57.38	27.56	21.03	50.99	29.01	22.58	59.02	39.68	31.69
Movement LOS	E	C	C	E	C	C	D	C	C	E	D	C
d_A, Approach Delay [s/veh]	35.63			32.19			35.84			39.82		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	36.09											
Intersection LOS	D											
Intersection V/C	0.836											

**Other Modes**


g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.647			2.937			3.035			2.910		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			618			745			673		
d_b, Bicycle Delay [s]	29.09			26.25			21.64			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.024			2.602			2.705			2.781		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):18.5  
B  
0.657**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	31	44	53	0	260	132	52	398	0
Total Analysis Volume [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	70	0	0	30	0	10	40	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	62	62	15	81
g / C, Green / Cycle		0.19	0.19	0.56	0.56	0.14	0.74
(v / s)_i Volume / Saturation Flow Rate		0.17	0.12	0.27	0.29	0.12	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		344	344	2143	1015	244	2798
d1, Uniform Delay [s]		43.16	40.79	14.38	14.77	46.46	6.58
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.78	1.80	0.79	1.90	8.31	0.85
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.62	0.48	0.52	0.85	0.57
d, Delay for Lane Group [s/veh]		49.93	42.60	15.16	16.67	54.77	7.43
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.47	5.42	7.69	8.31	6.13	7.43
50th-Percentile Queue Length [ft/ln]		211.86	135.45	192.14	207.78	153.13	185.65
95th-Percentile Queue Length [veh/ln]		13.25	9.24	12.23	13.04	10.18	11.90
95th-Percentile Queue Length [ft/ln]		331.22	230.88	305.80	325.98	254.60	297.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	49.93	49.93	42.60	0.00	15.16	16.67	54.77	7.43	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			46.89			15.67			12.92		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.51											
Intersection LOS	B											
Intersection V/C	0.657											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.323			1.974			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			1200			473			655		
d_b, Bicycle Delay [s]	55.00			8.80			32.07			24.89		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.403			2.420			3.046		
Bicycle LOS	D			B			B			C		

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	158	0	124	0	0	0	37	249	0	0	314	52
Total Analysis Volume [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	80	0	0	0	0	0	10	30	0	0	20	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.25	0.25	0.25		0.10	0.68	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.38	0.41
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	444	444	444		183	2587	1031	977
d1, Uniform Delay [s]	39.45	39.45	39.45		48.39	7.60	18.68	19.35
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.55	4.55	4.55		8.53	0.43	4.12	5.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.82	0.38	0.71	0.75
d, Delay for Lane Group [s/veh]	44.01	44.01	44.01		56.92	8.03	22.80	24.59
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.13	10.13	10.13		4.42	4.79	14.35	15.06
50th-Percentile Queue Length [ft/ln]	253.22	253.22	253.22		110.60	119.74	358.73	376.58
95th-Percentile Queue Length [veh/ln]	15.35	15.35	15.35		7.87	8.38	20.56	21.43
95th-Percentile Queue Length [ft/ln]	383.71	383.71	383.71		196.84	209.47	514.04	535.71

**Movement, Approach, & Intersection Results**

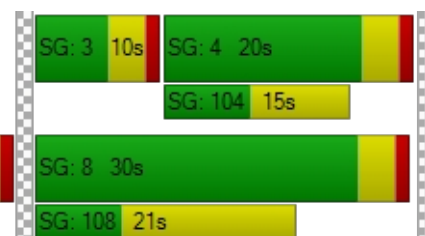
d_M, Delay for Movement [s/veh]	44.01	0.00	44.01	0.00	0.00	0.00	56.92	8.03	0.00	0.00	23.55	24.59
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.01			0.00			14.40			23.69		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.98											
Intersection LOS	C											
Intersection V/C	0.783											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.316	1.781	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	473	291
d_b, Bicycle Delay [s]	55.00	55.00	32.07	40.16
I_b,int, Bicycle LOS Score for Intersection	5.994	4.132	2.503	2.766
Bicycle LOS	F	D	B	C

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.497

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	47	1117	82	58	901	47	19	45	50	102	53	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	1117	82	58	901	47	19	45	50	102	53	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	279	21	15	225	12	5	11	13	26	13	21
Total Analysis Volume [veh/h]	47	1117	82	58	901	47	19	45	50	102	53	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	17	17
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.33	0.32	0.03	0.26	0.25	0.06	0.13
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1269	1473	1396	1212	1473	1396	311	320
d1, Uniform Delay [s]	2.84	4.11	4.07	2.86	3.73	3.71	42.14	45.54
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.89	0.90	0.07	0.61	0.63	0.72	3.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.42	0.41	0.05	0.33	0.33	0.37	0.75
d, Delay for Lane Group [s/veh]	2.89	5.00	4.97	2.93	4.34	4.33	42.86	49.09
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	4.05	3.73	0.26	2.89	2.68	2.86	6.68
50th-Percentile Queue Length [ft/ln]	5.28	101.26	93.15	6.59	72.13	67.01	71.49	167.00
95th-Percentile Queue Length [veh/ln]	0.38	7.29	6.71	0.47	5.19	4.82	5.15	10.92
95th-Percentile Queue Length [ft/ln]	9.51	182.26	167.68	11.87	129.84	120.62	128.68	272.96

**Movement, Approach, & Intersection Results**

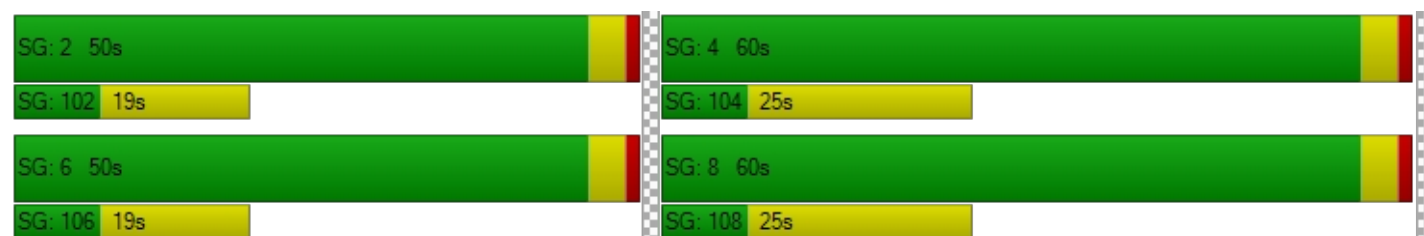
d_M, Delay for Movement [s/veh]	2.89	4.99	4.97	2.93	4.34	4.33	42.86	42.86	42.86	49.09	49.09	49.09
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.91			4.26			42.86			49.09		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.39											
Intersection LOS	B											
Intersection V/C	0.497											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.903			2.771			1.919			2.014		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.588			2.390			1.748			1.956		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	149	1083	203	49	1046	112	136	613	129	228	771	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	1083	203	49	1046	112	136	613	129	228	771	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	271	51	12	262	28	34	153	32	57	193	18
Total Analysis Volume [veh/h]	149	1083	203	49	1046	112	136	613	129	228	771	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	56	0	11	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	49	40	40	49	39	39	54	39	39	54	43	43
g / C, Green / Cycle	0.44	0.36	0.36	0.44	0.35	0.35	0.49	0.35	0.35	0.49	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.08	0.29	0.11	0.03	0.32	0.31	0.08	0.16	0.07	0.13	0.20	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	344	1376	652	428	665	630	686	1340	635	746	1471	697
d1, Uniform Delay [s]	18.71	31.34	25.25	17.64	34.10	33.59	15.75	27.52	24.86	16.68	25.94	21.52
k, delay calibration	0.11	0.11	0.11	0.11	0.22	0.20	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.86	1.03	0.27	0.12	9.48	7.34	0.14	1.13	0.72	1.06	1.34	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.79	0.31	0.11	0.91	0.88	0.20	0.46	0.20	0.31	0.52	0.10
d, Delay for Lane Group [s/veh]	19.57	32.37	25.52	17.76	43.58	40.93	15.89	28.64	25.58	17.74	27.28	21.82
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.39	12.78	3.85	0.73	16.80	14.87	1.91	6.38	2.47	3.57	7.92	1.23
50th-Percentile Queue Length [ft/ln]	59.72	319.62	96.29	18.23	420.09	371.85	47.83	159.50	61.83	89.18	198.12	30.65
95th-Percentile Queue Length [veh/ln]	4.30	18.65	6.93	1.31	23.53	21.20	3.44	10.52	4.45	6.42	12.54	2.21
95th-Percentile Queue Length [ft/ln]	107.50	466.22	173.32	32.81	588.16	529.98	86.10	263.05	111.30	160.53	313.54	55.17

**Movement, Approach, & Intersection Results**

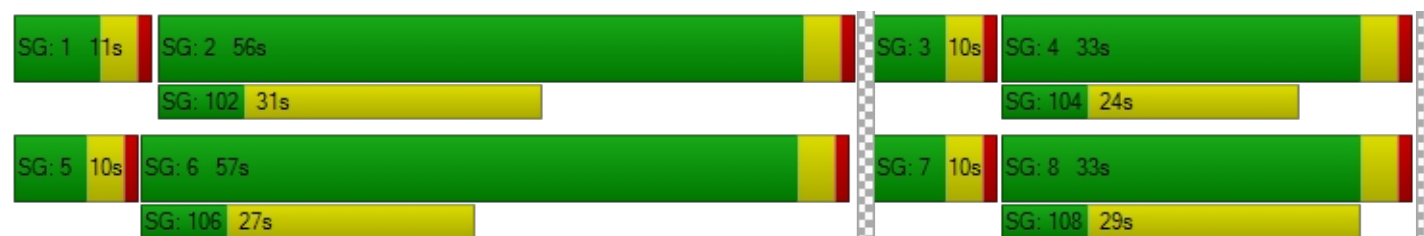
d_M, Delay for Movement [s/veh]	19.57	32.37	25.52	17.76	42.46	40.93	15.89	28.64	25.58	17.74	27.28	21.82
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	30.07			41.32			26.22			24.88		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.08											
Intersection LOS	C											
Intersection V/C	0.723											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.044			2.875			2.851			2.803		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			964			527			527		
d_b, Bicycle Delay [s]	15.29			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.743			2.555			2.284			2.442		
Bicycle LOS	B			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	144	1023	215	47	820	92	119	660	98	358	852	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	1023	215	47	820	92	119	660	98	358	852	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	256	54	12	205	23	30	165	25	90	213	22
Total Analysis Volume [veh/h]	144	1023	215	47	820	92	119	660	98	358	852	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	36	0	34	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	34	34	43	33	33	9	41	41	14	46	46
g / C, Green / Cycle	0.39	0.31	0.31	0.39	0.30	0.30	0.08	0.37	0.37	0.13	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.12	0.03	0.25	0.24	0.07	0.17	0.05	0.10	0.22	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	384	1189	563	347	570	540	150	1416	671	442	1579	748
d1, Uniform Delay [s]	22.13	35.56	29.51	20.91	35.99	35.56	49.51	26.21	22.91	46.80	24.23	19.74
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.61	1.95	0.43	0.18	3.32	2.89	8.95	1.10	0.46	3.58	1.33	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.86	0.38	0.14	0.84	0.81	0.79	0.47	0.15	0.81	0.54	0.11
d, Delay for Lane Group [s/veh]	22.74	37.51	29.94	21.08	39.31	38.45	58.46	27.31	23.36	50.38	25.56	20.06
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.53	13.01	4.49	0.78	12.31	11.07	3.58	6.71	1.77	4.97	8.50	1.42
50th-Percentile Queue Length [ft/ln]	63.16	325.23	112.31	19.40	307.74	276.70	89.44	167.81	44.28	124.28	212.50	35.38
95th-Percentile Queue Length [veh/ln]	4.55	18.92	7.97	1.40	18.06	16.52	6.44	10.96	3.19	8.63	13.28	2.55
95th-Percentile Queue Length [ft/ln]	113.69	473.11	199.20	34.92	451.59	413.10	160.99	274.03	79.70	215.69	332.03	63.68

**Movement, Approach, & Intersection Results**

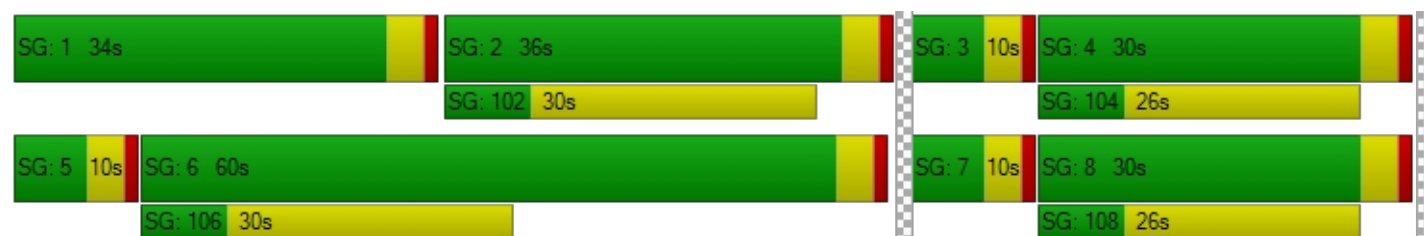
d_M, Delay for Movement [s/veh]	22.74	37.51	29.94	21.08	38.95	38.45	58.46	27.31	23.36	50.38	25.56	20.06
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	34.79			38.03			31.10			32.05		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	33.97											
Intersection LOS	C											
Intersection V/C	0.697											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.894			2.736			2.847			2.935		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			1018			473			473		
d_b, Bicycle Delay [s]	27.65			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.700			2.351			2.283			2.629		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.001

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	60	1400	51	22	77	1407	61	116	87	68	134	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1400	51	22	77	1407	61	116	87	68	134	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	350	13	6	19	352	15	29	22	17	34	4
Total Analysis Volume [veh/h]	60	1400	51	22	77	1407	61	116	87	68	134	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	79	0	0	79	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.39	0.39	0.01	0.04	0.78	0.15	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	72	1450	1374	1116	1450	1374	336	74	295
d1, Uniform Delay [s]	3.18	5.08	5.05	3.12	3.21	12.99	44.92	39.83	41.79
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.48	1.32	1.36	0.03	0.07	30.66	4.18	31.05	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.52	0.51	0.02	0.05	1.02	0.79	0.91	0.50
d, Delay for Lane Group [s/veh]	69.66	6.39	6.41	3.15	3.28	43.65	49.09	70.89	43.12
Lane Group LOS	E	A	A	A	A	F	D	E	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.60	5.91	5.54	0.11	0.38	36.96	7.38	2.24	3.78
50th-Percentile Queue Length [ft/ln]	39.98	147.72	138.56	2.68	9.44	923.94	184.58	55.97	94.55
95th-Percentile Queue Length [veh/ln]	2.88	9.90	9.40	0.19	0.68	48.01	11.84	4.03	6.81
95th-Percentile Queue Length [ft/ln]	71.96	247.39	235.09	4.82	17.00	1200.33	295.99	100.75	170.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	69.66	6.40	6.41	3.15	3.28	43.65	49.09	49.09	49.09	70.89	43.12	43.12
Movement LOS	E	A	A	A	A	F	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	8.92			40.99			49.09			51.82		
Approach LOS	A			D			D			D		
d_I, Intersection Delay [s/veh]	28.42											
Intersection LOS	C											
Intersection V/C	1.001											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.746			2.978			2.719			2.113		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1364			1364			491			491		
d_b, Bicycle Delay [s]	5.57			5.57			31.31			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.806			2.802			1.995			1.918		
Bicycle LOS	C			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	127	1317	76	56	1217	68	74	40	93	100	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	1317	76	56	1217	68	74	40	93	100	52	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	329	19	14	304	17	19	10	23	25	13	12
Total Analysis Volume [veh/h]	127	1317	76	56	1217	68	74	40	93	100	52	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	57	0	0	57	0	0	53	0	0	53	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	87	87	87	87	87	87	15	15
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.79	0.79	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.07	0.38	0.37	0.03	0.35	0.34	0.12	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1249	1507	1428	1222	1507	1428	285	290
d1, Uniform Delay [s]	2.52	3.78	3.75	2.42	3.61	3.58	46.56	46.33
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	1.09	1.12	0.07	0.94	0.96	3.50	2.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.48	0.47	0.05	0.44	0.43	0.73	0.69
d, Delay for Lane Group [s/veh]	2.69	4.86	4.86	2.49	4.55	4.54	50.06	49.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.53	4.43	4.13	0.22	3.90	3.63	5.79	5.50
50th-Percentile Queue Length [ft/ln]	13.13	110.83	103.28	5.56	97.62	90.64	144.68	137.54
95th-Percentile Queue Length [veh/ln]	0.95	7.89	7.44	0.40	7.03	6.53	9.73	9.35
95th-Percentile Queue Length [ft/ln]	23.64	197.15	185.90	10.00	175.71	163.16	243.31	233.71

**Movement, Approach, & Intersection Results**

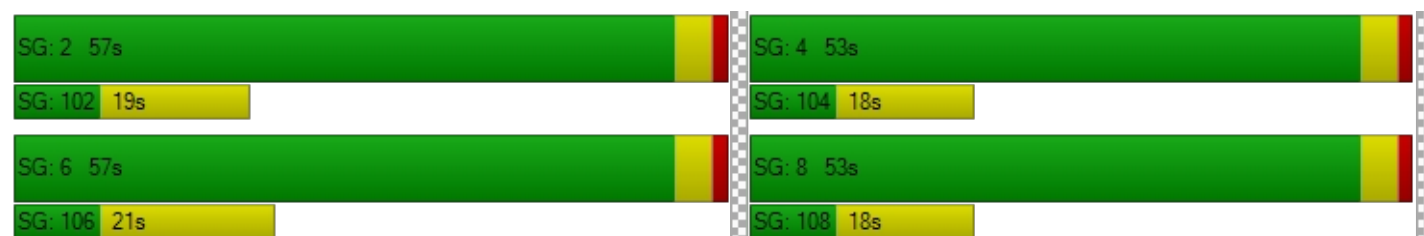
d_M, Delay for Movement [s/veh]	2.69	4.86	4.86	2.49	4.54	4.54	50.06	50.06	50.06	49.20	49.20	49.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.68			4.46			50.06			49.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.18											
Intersection LOS	B											
Intersection V/C	0.533											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.023			2.957			2.126			1.985		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			891			891		
d_b, Bicycle Delay [s]	14.77			14.77			16.91			16.91		
I_b,int, Bicycle LOS Score for Intersection	2.814			2.666			1.901			1.888		
Bicycle LOS	C			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.830

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	283	1340	233	202	1196	199	199	758	201	218	1075	186
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	1340	233	202	1196	199	199	758	201	218	1075	186
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	335	58	51	299	50	50	190	50	55	269	47
Total Analysis Volume [veh/h]	283	1340	233	202	1196	199	199	758	201	218	1075	186
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	43	0	11	41	0	18	39	0	17	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	39	39	7	37	37	14	35	35	13	34	34
g / C, Green / Cycle	0.08	0.35	0.35	0.06	0.34	0.34	0.13	0.32	0.32	0.12	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.08	0.35	0.13	0.06	0.30	0.14	0.11	0.13	0.11	0.12	0.19	0.10
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	286	1346	638	223	1277	605	228	1807	571	215	1767	558
d1, Uniform Delay [s]	50.45	35.42	26.34	51.18	34.70	28.15	47.18	29.60	28.89	48.42	32.27	29.20
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.05	10.37	0.35	12.97	2.50	0.45	10.03	0.72	1.71	31.59	1.57	1.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.99	1.00	0.37	0.91	0.90	0.41	0.87	0.42	0.35	1.01	0.61	0.33
d, Delay for Lane Group [s/veh]	72.49	45.79	26.69	64.15	37.20	28.60	57.21	30.31	30.59	80.01	33.83	30.80
Lane Group LOS	E	D	C	E	D	C	E	C	C	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.75	19.37	4.57	3.16	14.70	5.13	5.96	5.36	4.34	7.77	8.29	4.02
50th-Percentile Queue Length [ft/ln]	118.80	484.25	114.25	78.97	367.47	128.20	149.02	133.93	108.42	194.22	207.35	100.60
95th-Percentile Queue Length [veh/ln]	8.33	26.59	8.08	5.69	20.99	8.84	9.96	9.15	7.75	12.40	13.02	7.24
95th-Percentile Queue Length [ft/ln]	208.18	664.70	201.89	142.15	524.66	221.04	249.12	228.83	193.80	310.07	325.43	181.08

**Movement, Approach, & Intersection Results**

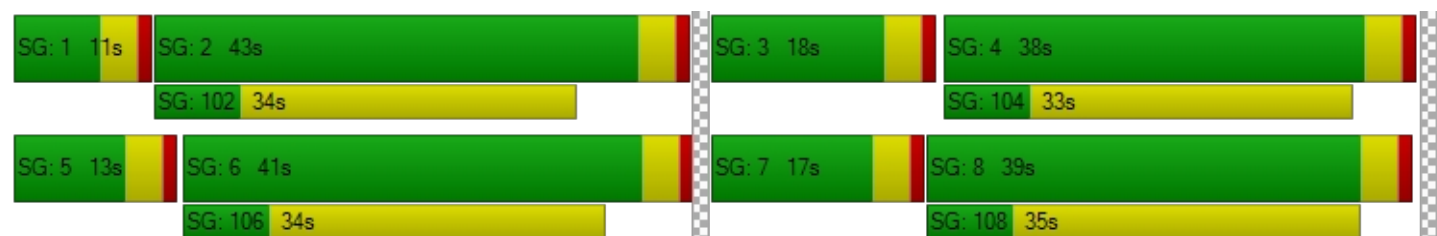
d_M, Delay for Movement [s/veh]	72.49	45.79	26.69	64.15	36.83	28.60	57.21	30.31	30.59	80.01	33.83	30.80
Movement LOS	E	D	C	E	D	C	E	C	C	F	C	C
d_A, Approach Delay [s/veh]	47.47			39.26			34.98			40.26		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	41.19											
Intersection LOS	D											
Intersection V/C	0.830											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.158			3.066			3.066			3.061		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			673			636			618		
d_b, Bicycle Delay [s]	22.91			24.22			25.57			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.091			2.438			2.197			2.373		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.907

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	247	1224	103	191	1024	192	212	732	147	258	834	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	247	1224	103	191	1024	192	212	732	147	258	834	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	306	26	48	256	48	53	183	37	65	209	35
Total Analysis Volume [veh/h]	247	1224	103	191	1024	192	212	732	147	258	834	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	50	0	10	41	0	16	37	0	13	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	40	40	50	34	34	15	38	38	10	33	33
g / C, Green / Cycle	0.45	0.36	0.36	0.45	0.31	0.31	0.14	0.34	0.34	0.09	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.14	0.32	0.06	0.11	0.27	0.11	0.12	0.19	0.09	0.07	0.27	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	446	1373	650	360	1172	555	244	1308	620	328	575	545
d1, Uniform Delay [s]	19.09	33.12	23.81	18.42	36.03	29.47	46.65	29.24	25.92	48.81	36.65	36.02
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	2.22	0.11	1.22	2.20	0.37	9.23	1.69	0.97	4.18	18.50	15.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.89	0.16	0.53	0.87	0.35	0.87	0.55	0.25	0.79	0.89	0.85
d, Delay for Lane Group [s/veh]	20.17	35.34	23.93	19.64	38.24	29.84	55.88	30.93	26.89	52.99	55.15	51.15
Lane Group LOS	C	D	C	B	D	C	E	C	C	D	E	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.10	15.44	1.84	3.08	13.15	3.98	6.29	7.97	3.09	3.65	15.86	13.74
50th-Percentile Queue Length [ft/ln]	102.42	386.04	45.94	76.99	328.64	99.45	157.13	199.18	77.24	91.20	396.61	343.50
95th-Percentile Queue Length [veh/ln]	7.37	21.89	3.31	5.54	19.09	7.16	10.40	12.60	5.56	6.57	22.40	19.82
95th-Percentile Queue Length [ft/ln]	184.36	547.15	82.70	138.58	477.29	179.01	259.92	314.91	139.03	164.16	559.91	495.48

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	20.17	35.34	23.93	19.64	38.24	29.84	55.88	30.88	26.89	52.99	53.61	51.15
Movement LOS	C	D	C	B	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	32.21			34.57			35.20			53.20		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	38.33											
Intersection LOS	D											
Intersection V/C	0.907											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.950			2.947			2.961			3.021		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			673			600			545		
d_b, Bicycle Delay [s]	18.62			24.22			26.95			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.858			2.720			2.160			2.576		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	494	0	0	358	132	0	0	0	78	97	95
Total Analysis Volume [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	67	58	58		25	25	25
g / C, Green / Cycle	0.05	0.67	0.58	0.58		0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.35	0.34	0.36		0.17	0.10	0.21
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3825	2192	1038		448	946	448
d1, Uniform Delay [s]	45.76	8.28	13.63	14.04		34.11	31.41	35.72
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.43	0.50	1.20	2.88		1.96	0.29	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.52	0.60	0.63		0.70	0.41	0.85
d, Delay for Lane Group [s/veh]	47.19	8.78	14.83	16.92		36.07	31.69	40.18
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.97	6.47	9.16	9.89		7.03	3.92	9.19
50th-Percentile Queue Length [ft/ln]	24.28	161.86	229.07	247.29		175.72	98.04	229.65
95th-Percentile Queue Length [veh/ln]	1.75	10.65	14.13	15.05		11.38	7.06	14.16
95th-Percentile Queue Length [ft/ln]	43.71	266.19	353.18	376.24		284.41	176.47	353.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.19	8.78	0.00	0.00	15.02	16.92	0.00	0.00	0.00	36.07	31.69	40.18
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	10.24			15.53			0.00			35.94		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.73											
Intersection LOS	B											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.203			2.399		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.688			2.636			4.132			2.450		
Bicycle LOS	B			B			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	307	0	0	310	86	0	0	0	43	147	156
Total Analysis Volume [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	42	42		38	38	38
g / C, Green / Cycle	0.07	0.54	0.42	0.42		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.28	0.29		0.21	0.20	0.35
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	3051	1613	764		693	731	693
d1, Uniform Delay [s]	45.79	13.77	22.93	23.43		24.05	23.58	29.00
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.40	2.08	5.06		0.69	0.56	9.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.40	0.65	0.69		0.55	0.51	0.90
d, Delay for Lane Group [s/veh]	57.11	14.17	25.00	28.48		24.74	24.14	38.47
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.35	10.01	10.83		7.05	6.75	15.42
50th-Percentile Queue Length [ft/ln]	72.68	133.71	250.35	270.75		176.25	168.66	385.62
95th-Percentile Queue Length [veh/ln]	5.23	9.14	15.20	16.23		11.40	11.01	21.87
95th-Percentile Queue Length [ft/ln]	130.82	228.54	380.10	405.68		285.11	275.16	546.64

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.11	14.17	0.00	0.00	25.52	28.48	0.00	0.00	0.00	24.74	24.36	38.47
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.49			26.16			0.00			30.78		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.96											
Intersection LOS	C											
Intersection V/C	0.792											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.224			2.395		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.292			2.429			4.132			2.701		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	349	54	71	377	0	181	74	37	0	0	0
Total Analysis Volume [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	10	67	25	25	25	
g / C, Green / Cycle	0.53	0.53	0.10	0.67	0.25	0.25	0.25	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.21	0.16	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3025	955	348	3820	874	475	450	
d1, Uniform Delay [s]	14.57	12.52	44.10	7.39	35.46	33.32	30.67	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	0.55	4.52	0.31	2.06	1.34	0.42	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.23	0.81	0.39	0.83	0.62	0.33	
d, Delay for Lane Group [s/veh]	15.08	13.07	48.62	7.70	37.52	34.65	31.09	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.38	2.65	3.61	4.40	8.42	6.45	2.95	
50th-Percentile Queue Length [ft/ln]	159.53	66.24	90.34	110.04	210.43	161.18	73.72	
95th-Percentile Queue Length [veh/ln]	10.52	4.77	6.50	7.84	13.18	10.61	5.31	
95th-Percentile Queue Length [ft/ln]	263.10	119.23	162.61	196.06	329.38	265.28	132.69	

**Movement, Approach, & Intersection Results**

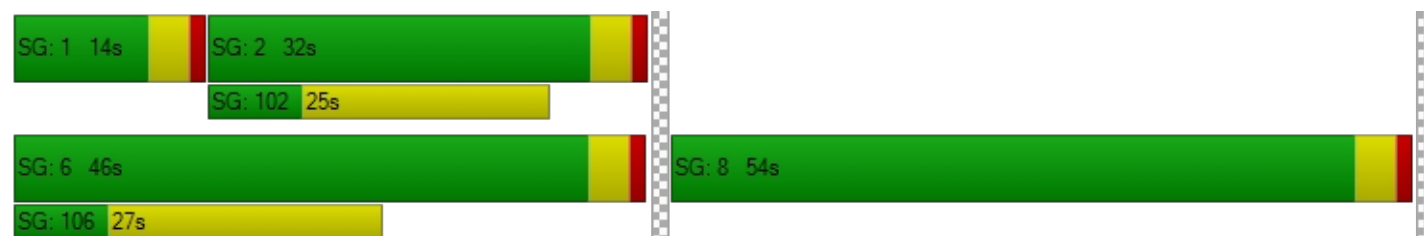
d_M, Delay for Movement [s/veh]	0.00	15.08	13.07	48.62	7.70	0.00	37.52	34.65	31.09	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	14.81			14.15			35.98			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.95											
Intersection LOS	B											
Intersection V/C	0.604											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.420			2.107		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.446			2.545			3.482			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	251	53	104	240	0	81	107	15	0	0	0
Total Analysis Volume [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.21	0.20	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1892	896	497	2584	432	456	432	
d1, Uniform Delay [s]	16.02	16.27	41.76	6.85	36.48	35.99	29.83	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.71	1.64	3.76	0.41	5.44	3.79	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.45	0.83	0.37	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.73	17.91	45.52	7.26	41.91	39.78	29.97	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.87	6.18	5.19	4.00	9.29	9.01	1.11	
50th-Percentile Queue Length [ft/ln]	146.83	154.57	129.81	100.01	232.37	225.37	27.72	
95th-Percentile Queue Length [veh/ln]	9.85	10.26	8.93	7.20	14.29	13.94	2.00	
95th-Percentile Queue Length [ft/ln]	246.20	256.52	223.24	180.03	357.36	348.48	49.90	

**Movement, Approach, & Intersection Results**

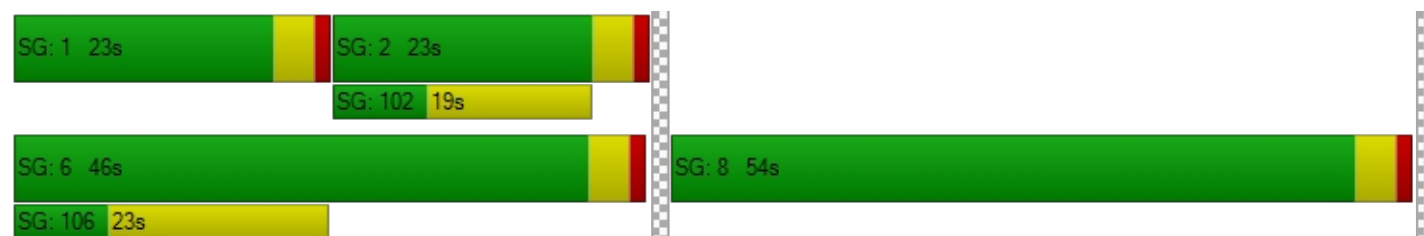
d_M, Delay for Movement [s/veh]	0.00	16.96	17.91	45.52	7.26	0.00	41.91	40.03	29.97	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	17.12			18.82			40.07			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.27											
Intersection LOS	C											
Intersection V/C	0.627											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.208			2.233		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.227			2.693			2.227			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.145

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	80	524	84	18	692
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	80	524	84	18	692
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	20	131	21	5	173
Total Analysis Volume [veh/h]	0	80	524	84	18	692
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.14	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	12.60	0.00	0.00	8.78	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.50	0.00	0.00	0.06	0.00
95th-Percentile Queue Length [ft/ln]	0.00	12.57	0.00	0.00	1.42	0.00
d_A, Approach Delay [s/veh]	12.60		0.00		0.22	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.83					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	16.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	903	226	81	598	0	47	0	55	287	0	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	903	226	81	598	0	47	0	55	287	0	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	226	57	20	150	0	12	0	14	72	0	19
Total Analysis Volume [veh/h]	0	903	226	81	598	0	47	0	55	287	0	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	82	82	20	20	20	20
g / C, Green / Cycle	0.66	0.66	0.75	0.75	0.18	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.30	0.31	0.05	0.16	0.03	0.03	0.16	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1256	1190	1152	2843	356	355	310	323
d1, Uniform Delay [s]	9.00	9.21	3.65	4.14	38.04	38.21	44.07	38.63
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	1.36	0.03	0.17	0.17	0.20	11.68	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.45	0.47	0.07	0.21	0.13	0.15	0.93	0.23
d, Delay for Lane Group [s/veh]	10.16	10.57	3.68	4.31	38.20	38.41	55.75	38.99
Lane Group LOS	B	B	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.40	6.59	0.42	1.77	1.09	1.28	8.58	1.74
50th-Percentile Queue Length [ft/ln]	160.03	164.70	10.41	44.37	27.18	31.97	214.55	43.62
95th-Percentile Queue Length [veh/ln]	10.55	10.80	0.75	3.19	1.96	2.30	13.39	3.14
95th-Percentile Queue Length [ft/ln]	263.76	269.93	18.74	79.87	48.93	57.54	334.67	78.51



**Movement, Approach, & Intersection Results**

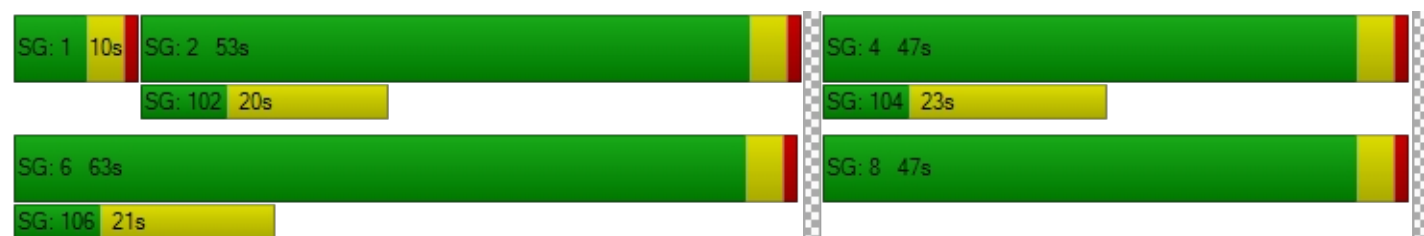
d_M, Delay for Movement [s/veh]	0.00	10.32	10.57	3.68	4.31	0.00	38.20	38.41	38.41	55.75	0.00	38.99
Movement LOS		B	B	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	10.37			4.24			38.32			52.32		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	16.46											
Intersection LOS	B											
Intersection V/C	0.547											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.708			1.774			2.245		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.491			2.120			1.728			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	32	455	355	7	64	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	455	355	7	64	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	114	89	2	16	20
Total Analysis Volume [veh/h]	32	455	355	7	64	79
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.13	0.12
d_M, Delay for Movement [s/veh]	8.09	0.00	0.00	0.00	14.24	12.23
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.08	0.00	0.00	0.00	0.95	0.95
95th-Percentile Queue Length [ft/ln]	2.06	0.00	0.00	0.00	23.83	23.83
d_A, Approach Delay [s/veh]	0.53		0.00		13.13	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.15					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	61	480	439	1	7	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	480	439	1	7	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	120	110	0	2	29
Total Analysis Volume [veh/h]	61	480	439	1	7	115
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.02	0.19
d_M, Delay for Movement [s/veh]	8.40	0.00	0.00	0.00	14.79	12.34
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.17	0.00	0.00	0.00	0.75	0.75
95th-Percentile Queue Length [ft/ln]	4.31	0.00	0.00	0.00	18.79	18.79
d_A, Approach Delay [s/veh]	0.95		0.00		12.48	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.84					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	15.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.078

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	530	28	43	569	31	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	530	28	43	569	31	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	133	7	11	142	8	16
Total Analysis Volume [veh/h]	530	28	43	569	31	62
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.08	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	8.71	0.00	15.82	13.46
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.13	0.00	0.71	0.71
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.32	0.00	17.67	17.67
d_A, Approach Delay [s/veh]	0.00		0.61		14.24	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.35					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.468

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	33	846	62	0	684	11	0	0	28	0	0	259
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	846	62	0	684	11	0	0	28	0	0	259
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	212	16	0	171	3	0	0	7	0	0	65
Total Analysis Volume [veh/h]	33	846	62	0	684	11	0	0	28	0	0	259
Pedestrian Volume [ped/h]	0			0			0			0		



**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.47
d_M, Delay for Movement [s/veh]	9.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.80	0.00	0.00	17.11
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	2.48
95th-Percentile Queue Length [ft/ln]	2.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	0.00	0.00	61.88
d_A, Approach Delay [s/veh]	0.32			0.00			10.80			17.11		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	2.62											
Intersection LOS	C											





*APPENDIX F-II*

**YEAR 2020 CUMULATIVE SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	96	534	106	231	572	172	164	612	96	119	824	232
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	534	106	231	572	172	164	612	96	119	824	232
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	134	27	58	143	43	41	153	24	30	206	58
Total Analysis Volume [veh/h]	96	534	106	231	572	172	164	612	96	119	824	232
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	12	42	0	14	43	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	56	56	8	58	58	10	25	25	6	20	20
g / C, Green / Cycle	0.05	0.50	0.50	0.07	0.53	0.53	0.09	0.22	0.22	0.05	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.06	0.07	0.13	0.13	0.09	0.12	0.13	0.03	0.14	0.13
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	184	2873	907	257	1995	945	165	849	402	189	1059	334
d1, Uniform Delay [s]	50.81	14.95	14.39	50.60	14.33	14.32	49.99	37.93	38.18	51.01	42.67	41.90
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.29	0.14	0.26	10.84	0.31	0.64	31.49	0.58	1.34	3.44	1.27	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.19	0.12	0.90	0.25	0.25	1.00	0.56	0.58	0.63	0.78	0.69
d, Delay for Lane Group [s/veh]	53.10	15.09	14.66	61.44	14.64	14.97	81.48	38.51	39.53	54.44	43.94	44.49
Lane Group LOS	D	B	B	E	B	B	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.35	2.44	1.45	3.53	3.47	3.36	5.93	5.71	5.77	1.69	7.19	6.10
50th-Percentile Queue Length [ft/ln]	33.66	61.12	36.16	88.36	86.76	84.03	148.34	142.75	144.37	42.37	179.82	152.58
95th-Percentile Queue Length [veh/ln]	2.42	4.40	2.60	6.36	6.25	6.05	9.93	9.63	9.72	3.05	11.59	10.15
95th-Percentile Queue Length [ft/ln]	60.58	110.02	65.09	159.05	156.17	151.25	248.21	240.72	242.89	76.26	289.78	253.87

**Movement, Approach, & Intersection Results**

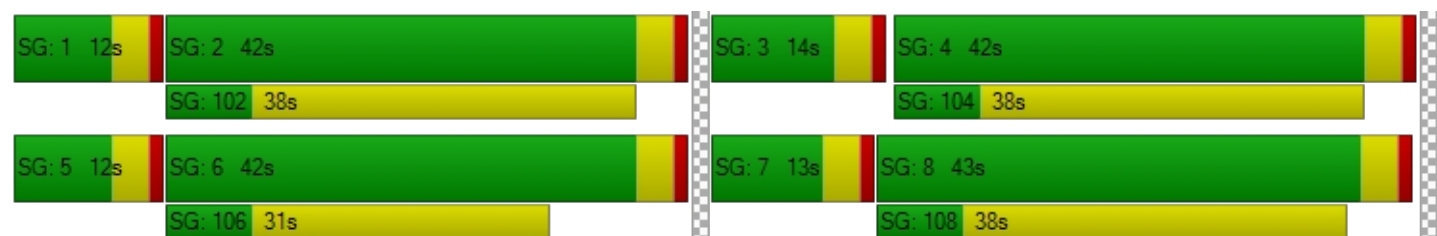
d_M, Delay for Movement [s/veh]	53.10	15.09	14.66	61.44	14.68	14.97	81.48	38.74	39.53	54.44	43.94	44.49
Movement LOS	D	B	B	E	B	B	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	19.98			25.81			46.87			45.11		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	35.59											
Intersection LOS	D											
Intersection V/C	0.464											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.024			2.967			2.877			3.089		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			709			691		
d_b, Bicycle Delay [s]	23.56			23.56			22.91			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.964			2.096			2.039			2.206		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	19	833	552	78	889	31	64	123	27	494	84	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	833	552	78	889	31	64	123	27	494	84	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	208	138	20	222	8	16	31	7	124	21	0
Total Analysis Volume [veh/h]	19	833	552	78	889	31	64	123	27	494	84	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	58	6	61	61	9	9	9	21	21
g / C, Green / Cycle	0.02	0.52	0.06	0.56	0.56	0.09	0.09	0.09	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.04	0.19	0.10	0.04	0.06	0.02	0.16	0.16
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	45	2986	102	2110	999	155	164	155	339	339
d1, Uniform Delay [s]	52.88	14.61	51.23	13.53	12.10	47.66	49.14	46.66	43.18	43.29
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.11	0.23	11.43	0.46	0.39	1.74	6.72	0.53	5.90	6.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.28	0.77	0.35	0.18	0.41	0.75	0.17	0.85	0.86
d, Delay for Lane Group [s/veh]	59.00	14.85	62.67	13.99	12.49	49.40	55.87	47.19	49.07	49.66
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.59	3.85	2.44	5.05	2.24	1.74	3.60	0.71	8.05	8.21
50th-Percentile Queue Length [ft/ln]	14.85	96.24	61.01	126.19	55.91	43.45	90.04	17.74	201.23	205.37
95th-Percentile Queue Length [veh/ln]	1.07	6.93	4.39	8.73	4.03	3.13	6.48	1.28	12.70	12.92
95th-Percentile Queue Length [ft/ln]	26.73	173.23	109.81	218.30	100.64	78.21	162.08	31.93	317.56	322.88

**Movement, Approach, & Intersection Results**

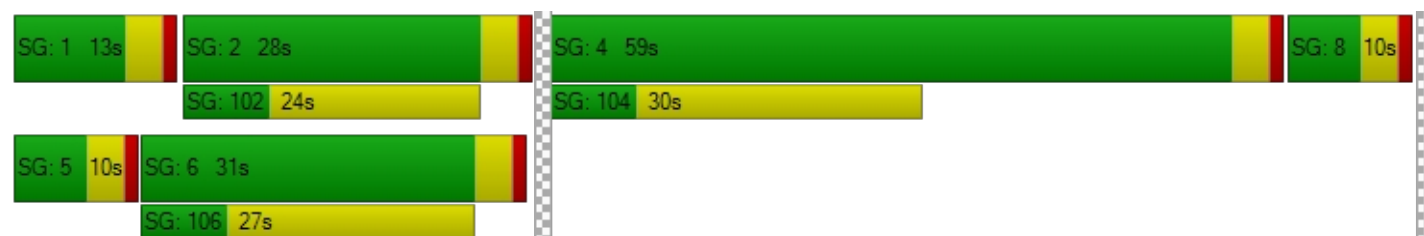
d_M, Delay for Movement [s/veh]	59.00	14.85	0.00	62.67	13.74	12.49	49.40	55.87	47.19	49.32	49.66	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	15.83			17.52			52.84			49.37		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.81											
Intersection LOS	C											
Intersection V/C	0.505											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.867			2.225			2.203		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.028			2.109			1.913			2.513		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	83	1117	44	170	1217	27	30	92	109	84	114	294
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	1117	44	170	1217	27	30	92	109	84	114	294
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	279	11	43	304	7	8	23	27	21	29	74
Total Analysis Volume [veh/h]	83	1117	44	170	1217	27	30	92	109	84	114	294
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	60	0	13	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	7	71	71	9	73	73	18	18	18	18	18	31
g / C, Green / Cycle	0.06	0.64	0.64	0.08	0.66	0.66	0.17	0.17	0.17	0.17	0.17	0.29
(v / s)_i Volume / Saturation Flow Rate	0.05	0.32	0.31	0.05	0.32	0.02	0.02	0.05	0.06	0.05	0.06	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	110	1218	1154	292	2521	1194	238	316	299	257	316	515
d1, Uniform Delay [s]	50.81	10.34	10.28	48.54	9.15	6.32	38.85	40.15	40.67	40.07	40.64	33.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.16
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.06	1.42	1.47	1.84	0.66	0.03	0.24	0.50	0.74	0.73	0.69	1.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.49	0.49	0.58	0.48	0.02	0.13	0.29	0.36	0.33	0.36	0.57
d, Delay for Lane Group [s/veh]	60.87	11.77	11.75	50.39	9.82	6.35	39.09	40.65	41.41	40.81	41.34	34.93
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.55	7.56	7.05	2.32	6.85	0.21	0.70	2.23	2.68	2.04	2.80	6.86
50th-Percentile Queue Length [ft/ln]	63.83	188.90	176.22	58.02	171.24	5.35	17.60	55.65	67.00	51.01	69.94	171.46
95th-Percentile Queue Length [veh/ln]	4.60	12.06	11.40	4.18	11.14	0.39	1.27	4.01	4.82	3.67	5.04	11.15
95th-Percentile Queue Length [ft/ln]	114.90	301.60	285.08	104.43	278.55	9.64	31.68	100.17	120.59	91.83	125.89	278.83

**Movement, Approach, & Intersection Results**

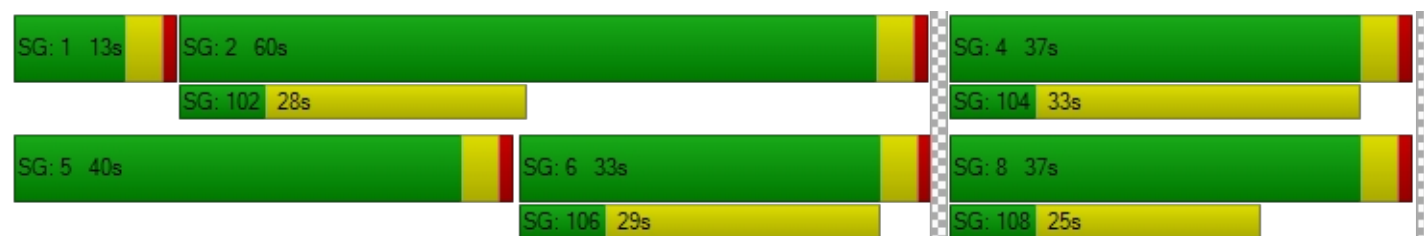
d_M, Delay for Movement [s/veh]	60.87	11.76	11.75	50.39	9.82	6.35	39.09	40.65	41.41	40.81	41.34	34.93
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	15.04			14.63			40.81			37.42		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.88											
Intersection LOS	B											
Intersection V/C	0.576											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.946			3.044			2.252			2.465		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1018			527			600			600		
d_b, Bicycle Delay [s]	13.25			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.586			2.726			1.941			2.371		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	215	264	62	89	183	21	16	214	133	78	285	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	215	264	62	89	183	21	16	214	133	78	285	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	66	16	22	46	5	4	54	33	20	71	35
Total Analysis Volume [veh/h]	215	264	62	89	183	21	16	214	133	78	285	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	35	0	0	30	0	0	45	45	0	45	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	41	41	41	41	16	16	61	16	16	16
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.14	0.14	0.55	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.12	0.15	0.03	0.05	0.11	0.01	0.11	0.07	0.04	0.12	0.11
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	671	671	671	671	671	113	276	998	125	276	261
d1, Uniform Delay [s]	24.52	25.30	22.36	22.72	24.35	40.45	45.18	11.77	41.91	45.53	45.00
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.26	1.73	0.27	0.41	1.17	0.56	4.65	0.28	5.01	6.04	4.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.32	0.39	0.09	0.13	0.30	0.14	0.78	0.13	0.62	0.82	0.75
d, Delay for Lane Group [s/veh]	25.78	27.03	22.64	23.13	25.52	41.02	49.83	12.04	46.92	51.57	49.31
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.20	5.35	1.09	1.60	3.96	0.39	5.96	1.62	2.07	6.44	5.43
50th-Percentile Queue Length [ft/ln]	105.05	133.73	27.36	39.94	98.90	9.82	148.95	40.43	51.69	161.11	135.70
95th-Percentile Queue Length [veh/ln]	7.56	9.14	1.97	2.88	7.12	0.71	9.96	2.91	3.72	10.61	9.25
95th-Percentile Queue Length [ft/ln]	189.09	228.56	49.24	71.90	178.02	17.67	249.02	72.78	93.05	265.19	231.22

**Movement, Approach, & Intersection Results**

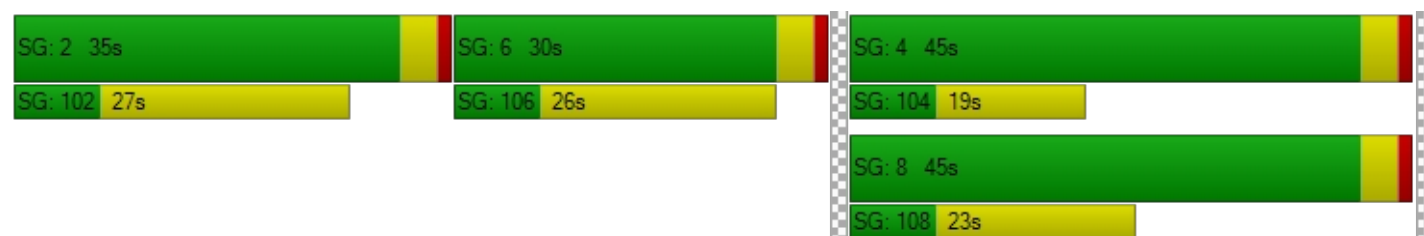
d_M, Delay for Movement [s/veh]	25.78	27.03	22.64	23.13	25.52	25.52	41.02	49.83	12.04	46.92	51.11	49.31
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	26.03			24.79			35.60			49.96		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.92											
Intersection LOS	C											
Intersection V/C	0.426											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.479			2.204			2.482			2.352		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			473			745			745		
d_b, Bicycle Delay [s]	28.37			32.07			21.64			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.452			2.043			2.159			1.973		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.304

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	15	143	79	259	384	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	143	79	259	384	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	36	20	65	96	7
Total Analysis Volume [veh/h]	15	143	79	259	384	28
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.04	0.14	0.20	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	178	178	1430	1574	1574	1491
d1, Uniform Delay [s]	44.99	48.46	1.69	1.87	2.03	1.64
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	8.25	0.07	0.23	0.37	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.80	0.06	0.16	0.24	0.02
d, Delay for Lane Group [s/veh]	45.19	56.71	1.76	2.10	2.39	1.66
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.38	4.23	0.22	0.80	1.29	0.08
50th-Percentile Queue Length [ft/ln]	9.56	105.84	5.60	20.12	32.37	1.91
95th-Percentile Queue Length [veh/ln]	0.69	7.61	0.40	1.45	2.33	0.14
95th-Percentile Queue Length [ft/ln]	17.21	190.20	10.07	36.21	58.26	3.44

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	45.19	56.71	1.76	2.10	2.39	1.66
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.62		2.02		2.34	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	11.49					
Intersection LOS	B					
Intersection V/C	0.304					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.148	2.231	2.173
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.690	4.812
Bicycle LOS	D	E	E

**Sequence**





Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.406

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	58	1043	22	19	980	47	67	42	72	30	35	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	1043	22	19	980	47	67	42	72	30	35	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	261	6	5	245	12	17	11	18	8	9	5
Total Analysis Volume [veh/h]	58	1043	22	19	980	47	67	42	72	30	35	20
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	59	0	10	59	0	11	30	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	88	81	81	88	79	79	14	7	7	14	5	5
g / C, Green / Cycle	0.80	0.74	0.74	0.80	0.72	0.72	0.13	0.06	0.06	0.13	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.29	0.01	0.28	0.28	0.04	0.02	0.04	0.02	0.02	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1323	1401	1327	1328	1360	1289	307	113	107	263	85	81
d1, Uniform Delay [s]	2.32	5.34	5.33	2.27	6.16	6.12	43.34	49.77	50.69	42.44	50.97	50.95
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.83	0.86	0.00	0.85	0.87	0.35	2.01	7.08	0.19	2.28	2.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.39	0.39	0.01	0.39	0.38	0.22	0.37	0.67	0.11	0.34	0.33
d, Delay for Lane Group [s/veh]	2.38	6.17	6.19	2.27	7.01	6.99	43.70	51.78	57.78	42.63	53.25	53.28
Lane Group LOS	A	A	A	A	A	A	D	D	E	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.22	4.28	4.03	0.06	4.58	4.26	1.68	1.17	2.15	0.74	0.82	0.76
50th-Percentile Queue Length [ft/ln]	5.48	106.92	100.66	1.61	114.55	106.44	42.06	29.35	53.77	18.46	20.42	18.97
95th-Percentile Queue Length [veh/ln]	0.39	7.67	7.25	0.12	8.09	7.64	3.03	2.11	3.87	1.33	1.47	1.37
95th-Percentile Queue Length [ft/ln]	9.86	191.71	181.19	2.90	202.31	191.05	75.71	52.84	96.78	33.22	36.75	34.15

**Movement, Approach, & Intersection Results**

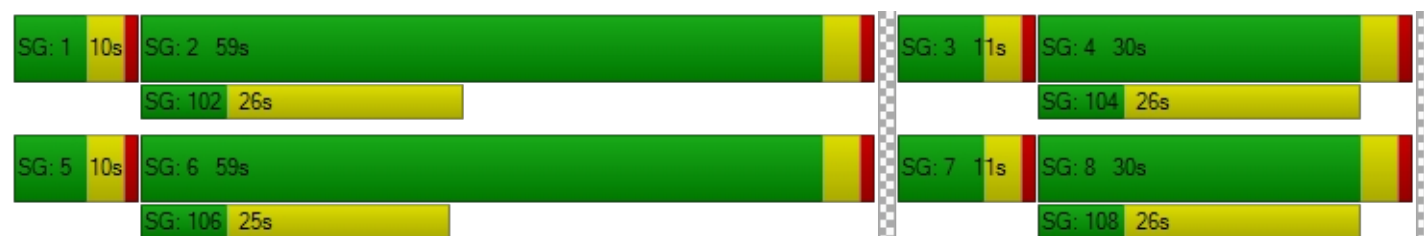
d_M, Delay for Movement [s/veh]	2.38	6.18	6.19	2.27	7.00	6.99	43.70	51.78	57.78	42.63	53.26	53.28
Movement LOS	A	A	A	A	A	A	D	D	E	D	D	D
d_A, Approach Delay [s/veh]	5.98			6.91			51.17			49.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.26											
Intersection LOS	B											
Intersection V/C	0.406											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.743			2.740			2.433			2.363		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1000			473			473		
d_b, Bicycle Delay [s]	13.75			13.75			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.486			2.423			1.709			1.630		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	118	951	133	126	804	159	166	434	120	179	483	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	951	133	126	804	159	166	434	120	179	483	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	238	33	32	201	40	42	109	30	45	121	31
Total Analysis Volume [veh/h]	118	951	133	126	804	159	166	434	120	179	483	125
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	14	59	0	10	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	71	61	61	71	61	61	31	21	21	31	17	17
g / C, Green / Cycle	0.64	0.55	0.55	0.64	0.55	0.55	0.29	0.19	0.19	0.29	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.29	0.07	0.27	0.25	0.09	0.16	0.14	0.10	0.13	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	942	1047	992	891	1048	993	395	368	349	348	602	285
d1, Uniform Delay [s]	7.56	15.81	15.54	7.59	15.12	14.81	30.96	42.34	41.80	31.21	44.66	41.89
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	2.02	1.95	0.07	1.61	1.52	0.71	4.04	3.14	1.18	2.54	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.54	0.52	0.14	0.49	0.46	0.42	0.80	0.74	0.51	0.80	0.44
d, Delay for Lane Group [s/veh]	7.83	17.83	17.49	7.67	16.73	16.33	31.67	46.38	44.94	32.39	47.20	42.95
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.09	9.34	8.35	1.11	7.97	6.98	3.55	8.00	6.90	3.89	6.53	3.15
50th-Percentile Queue Length [ft/ln]	27.21	233.60	208.85	27.72	199.25	174.51	88.68	200.05	172.49	97.13	163.36	78.83
95th-Percentile Queue Length [veh/ln]	1.96	14.36	13.09	2.00	12.60	11.31	6.38	12.64	11.21	6.99	10.73	5.68
95th-Percentile Queue Length [ft/ln]	48.98	358.93	327.36	49.89	315.00	282.84	159.62	316.03	280.18	174.83	268.16	141.89

**Movement, Approach, & Intersection Results**

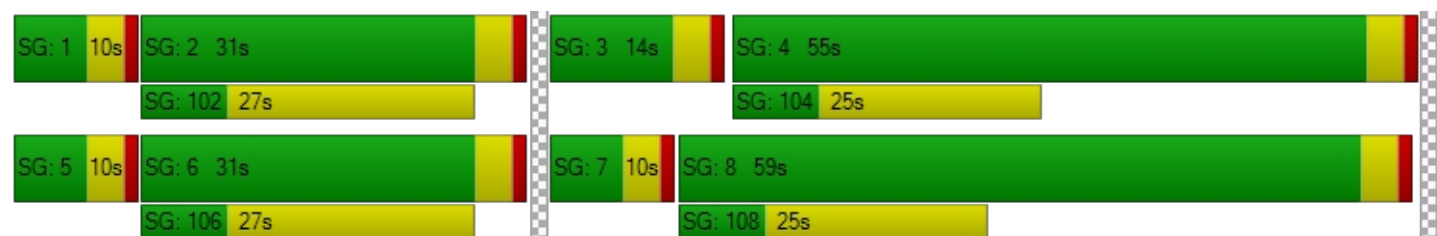
d_M, Delay for Movement [s/veh]	7.83	17.69	17.49	7.67	16.58	16.33	31.67	45.92	44.94	32.39	47.20	42.95
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	16.70			15.51			42.47			43.16		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.73											
Intersection LOS	C											
Intersection V/C	0.658											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.813			2.806			2.694			2.805		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			927		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			15.82		
I_b,int, Bicycle LOS Score for Intersection	2.551			2.458			2.154			2.209		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.429

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	120	297	102	25	379	62	94	534	120	118	593	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	297	102	25	379	62	94	534	120	118	593	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	74	26	6	95	16	24	134	30	30	148	10
Total Analysis Volume [veh/h]	120	297	102	25	379	62	94	534	120	118	593	40
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	32	0	10	29	0	11	55	0	13	57	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	69	62	62	69	59	59	7	23	23	6	22	22
g / C, Green / Cycle	0.63	0.56	0.56	0.63	0.54	0.54	0.06	0.21	0.21	0.05	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.07	0.08	0.06	0.01	0.12	0.12	0.05	0.18	0.17	0.03	0.16	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1100	2133	1010	1149	1021	967	116	398	377	189	756	358
d1, Uniform Delay [s]	8.17	11.50	11.24	7.74	13.41	13.34	50.84	42.08	41.51	51.00	41.86	36.13
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.14	0.20	0.01	0.51	0.52	12.55	5.94	4.37	3.37	1.84	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.11	0.14	0.10	0.02	0.23	0.22	0.81	0.87	0.82	0.63	0.78	0.11
d, Delay for Lane Group [s/veh]	8.37	11.63	11.44	7.74	13.92	13.86	63.39	48.02	45.88	54.37	43.70	36.27
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.15	1.73	1.19	0.22	3.09	2.81	2.96	9.67	8.37	1.68	7.79	0.90
50th-Percentile Queue Length [ft/ln]	28.78	43.28	29.77	5.43	77.28	70.35	73.89	241.71	209.14	41.98	194.67	22.45
95th-Percentile Queue Length [veh/ln]	2.07	3.12	2.14	0.39	5.56	5.07	5.32	14.77	13.11	3.02	12.36	1.62
95th-Percentile Queue Length [ft/ln]	51.80	77.90	53.59	9.78	139.11	126.64	133.01	369.20	327.73	75.56	309.08	40.40

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	8.37	11.63	11.44	7.74	13.90	13.86	63.39	47.27	45.88	54.37	43.70	36.27
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.84			13.56			49.07			44.98		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	33.19											
Intersection LOS	C											
Intersection V/C	0.429											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.647			2.484			2.701			2.821		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			455			927			964		
d_b, Bicycle Delay [s]	30.56			32.84			15.82			14.77		
I_b,int, Bicycle LOS Score for Intersection	1.988			1.944			2.177			2.179		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.276

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	22	13	131	19	26	23	654	7	7	736	126
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	22	13	131	19	26	23	654	7	7	736	126
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	3	33	5	7	6	164	2	2	184	32
Total Analysis Volume [veh/h]	12	22	13	131	19	26	23	654	7	7	736	126
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	7	15	87	87	87	80	80	90
g / C, Green / Cycle	0.04	0.04	0.04	0.06	0.14	0.79	0.79	0.79	0.72	0.72	0.82
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.04	0.03	0.01	0.18	0.18	0.00	0.19	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	72	80	76	212	250	1385	1498	1419	1242	2751	1477
d1, Uniform Delay [s]	50.83	51.08	50.86	50.46	41.85	2.49	3.00	3.00	4.21	5.20	1.90
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	1.84	1.06	2.94	0.34	0.00	0.35	0.37	0.01	0.24	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.28	0.17	0.62	0.18	0.02	0.23	0.23	0.01	0.27	0.09
d, Delay for Lane Group [s/veh]	51.91	52.92	51.92	53.40	42.19	2.50	3.35	3.37	4.22	5.44	1.92
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.34	0.63	0.37	1.84	1.11	0.08	1.62	1.54	0.04	2.62	0.36
50th-Percentile Queue Length [ft/ln]	8.51	15.71	9.20	46.11	27.65	2.12	40.62	38.51	1.04	65.38	8.98
95th-Percentile Queue Length [veh/ln]	0.61	1.13	0.66	3.32	1.99	0.15	2.92	2.77	0.08	4.71	0.65
95th-Percentile Queue Length [ft/ln]	15.32	28.28	16.56	83.00	49.76	3.82	73.11	69.31	1.88	117.68	16.17

**Movement, Approach, & Intersection Results**

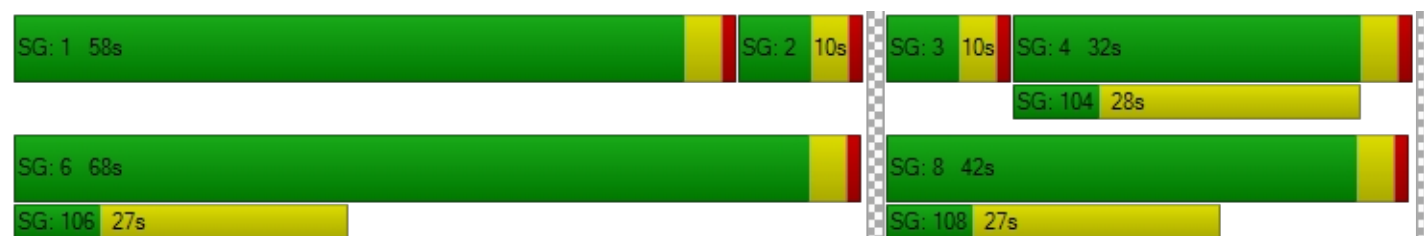
d_M, Delay for Movement [s/veh]	51.91	52.92	51.92	53.40	42.19	42.19	2.50	3.36	3.37	4.22	5.44	1.92
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.39			50.53			3.33			4.92		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.08											
Intersection LOS	B											
Intersection V/C	0.276											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.170			2.250			2.611			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.637			1.850			2.124			2.277		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.417

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	75	110	95	120	176	72	53	667	63	96	786	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	110	95	120	176	72	53	667	63	96	786	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	28	24	30	44	18	13	167	16	24	197	13
Total Analysis Volume [veh/h]	75	110	95	120	176	72	53	667	63	96	786	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	21	40	0	19	38	0	10	38	0	13	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	21	9	9	21	12	12	81	71	71	81	72	72
g / C, Green / Cycle	0.19	0.08	0.08	0.19	0.11	0.11	0.73	0.65	0.65	0.73	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.05	0.07	0.07	0.06	0.03	0.20	0.19	0.05	0.23	0.22
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	330	154	146	349	203	192	1218	1227	1162	1245	1242	1176
d1, Uniform Delay [s]	37.42	49.33	49.06	38.42	47.19	46.98	4.00	8.64	8.57	4.10	8.57	8.51
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	5.99	4.80	0.58	3.46	3.08	0.01	0.66	0.66	0.12	0.78	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.71	0.65	0.34	0.65	0.61	0.04	0.31	0.30	0.08	0.35	0.34
d, Delay for Lane Group [s/veh]	37.76	55.32	53.86	39.00	50.65	50.06	4.02	9.30	9.24	4.22	9.35	9.31
Lane Group LOS	D	E	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.74	3.20	2.72	2.86	3.64	3.21	0.29	3.99	3.65	0.57	4.60	4.25
50th-Percentile Queue Length [ft/ln]	43.46	80.01	68.09	71.50	91.04	80.28	7.25	99.75	91.28	14.28	115.05	106.18
95th-Percentile Queue Length [veh/ln]	3.13	5.76	4.90	5.15	6.56	5.78	0.52	7.18	6.57	1.03	8.12	7.63
95th-Percentile Queue Length [ft/ln]	78.22	144.02	122.56	128.70	163.88	144.51	13.05	179.56	164.30	25.70	203.00	190.68

**Movement, Approach, & Intersection Results**

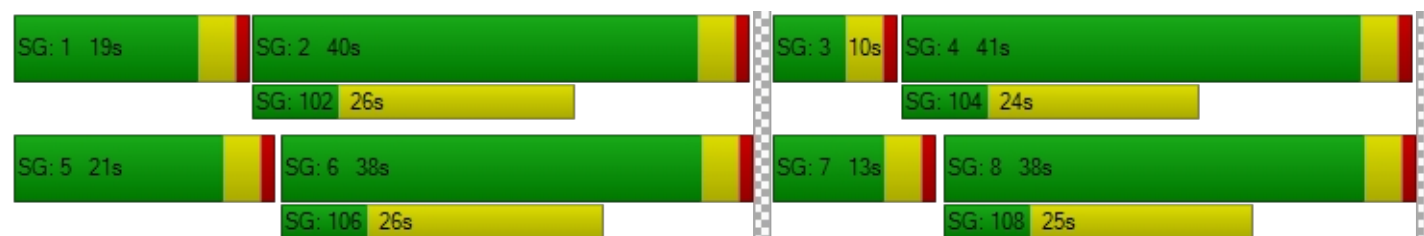
d_M, Delay for Movement [s/veh]	37.76	55.32	53.86	39.00	50.50	50.06	4.02	9.27	9.24	4.22	9.33	9.31
Movement LOS	D	E	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	50.12			46.66			8.91			8.81		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	19.62											
Intersection LOS	B											
Intersection V/C	0.417											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.520			2.333			2.657			2.680		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			618			618			673		
d_b, Bicycle Delay [s]	24.89			26.25			26.25			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.022			1.863			2.206			2.330		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	39	41	51	29	22	33	26	764	42	49	846	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	41	51	29	22	33	26	764	42	49	846	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	10	13	7	6	8	7	191	11	12	212	12
Total Analysis Volume [veh/h]	39	41	51	29	22	33	26	764	42	49	846	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	11	69	0	10	68	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	87	87	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.87	0.79	0.79	0.87	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.03	0.02	0.03	0.01	0.22	0.22	0.03	0.24	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	80	103	97	96	97	1546	1509	1430	1555	1532	1452
d1, Uniform Delay [s]	50.31	50.30	50.65	50.02	50.77	0.90	2.99	2.97	0.91	2.72	2.70
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.57	2.50	4.33	1.76	5.09	0.00	0.46	0.47	0.04	0.51	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.49	0.40	0.52	0.30	0.57	0.02	0.28	0.27	0.03	0.30	0.30
d, Delay for Lane Group [s/veh]	54.88	52.80	54.98	51.78	55.86	0.90	3.44	3.44	0.95	3.23	3.23
Lane Group LOS	D	D	D	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.14	1.16	1.48	0.81	1.61	0.03	2.01	1.87	0.07	2.06	1.92
50th-Percentile Queue Length [ft/ln]	28.47	29.05	37.08	20.35	40.35	0.69	50.16	46.65	1.64	51.57	47.88
95th-Percentile Queue Length [veh/ln]	2.05	2.09	2.67	1.46	2.91	0.05	3.61	3.36	0.12	3.71	3.45
95th-Percentile Queue Length [ft/ln]	51.25	52.29	66.74	36.62	72.63	1.25	90.29	83.97	2.95	92.82	86.19

**Movement, Approach, & Intersection Results**

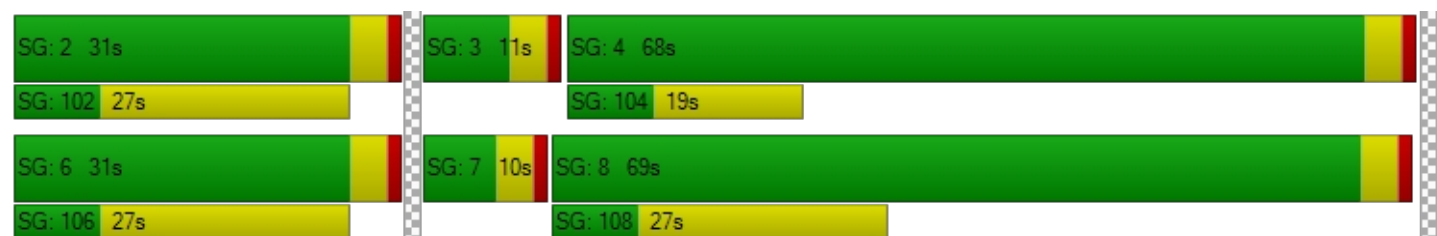
d_M, Delay for Movement [s/veh]	54.88	52.80	54.98	51.78	55.86	55.86	0.90	3.44	3.44	0.95	3.23	3.23
Movement LOS	D	D	D	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.27			54.45			3.36			3.11		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.75											
Intersection LOS	A											
Intersection V/C	0.311											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.257			2.045			2.706			2.699		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1182			1164		
d_b, Bicycle Delay [s]	31.31			31.31			9.20			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.776			1.698			2.246			2.338		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.501

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	111	259	86	148	300	252	231	628	70	138	572	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	259	86	148	300	252	231	628	70	138	572	130
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	65	22	37	75	63	58	157	18	35	143	33
Total Analysis Volume [veh/h]	111	259	86	148	300	252	231	628	70	138	572	130
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	20	47	0	14	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	56	56	7	55	69	10	21	21	10	21	21
g / C, Green / Cycle	0.07	0.51	0.51	0.06	0.50	0.62	0.09	0.19	0.19	0.09	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.05	0.04	0.08	0.14	0.07	0.17	0.04	0.08	0.15	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	132	1932	915	214	1884	1122	319	737	349	165	738	349
d1, Uniform Delay [s]	50.37	14.28	13.98	50.68	15.19	9.08	48.68	42.86	37.23	49.21	42.08	38.53
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.05	0.14	0.20	4.00	0.18	0.10	3.11	2.93	0.28	10.63	1.79	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.13	0.09	0.69	0.16	0.22	0.72	0.85	0.20	0.84	0.78	0.37
d, Delay for Lane Group [s/veh]	63.42	14.43	14.18	54.68	15.37	9.18	51.79	45.79	37.51	59.83	43.87	39.19
Lane Group LOS	E	B	B	D	B	A	D	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.49	1.72	1.15	2.11	2.08	2.56	3.22	8.49	1.61	4.21	7.51	3.11
50th-Percentile Queue Length [ft/ln]	87.25	43.07	28.66	52.86	52.08	63.89	80.47	212.20	40.31	105.18	187.68	77.80
95th-Percentile Queue Length [veh/ln]	6.28	3.10	2.06	3.81	3.75	4.60	5.79	13.27	2.90	7.57	12.00	5.60
95th-Percentile Queue Length [ft/ln]	157.05	77.53	51.59	95.15	93.74	115.01	144.84	331.65	72.56	189.28	300.01	140.04

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.42	14.43	14.18	54.68	15.37	9.18	51.79	45.79	37.51	59.83	43.87	39.19
Movement LOS	E	B	B	D	B	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	26.31			21.45			46.66			45.77		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.20											
Intersection LOS	D											
Intersection V/C	0.501											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.619			2.787			2.863			2.739		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			673		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			24.22		
I_b,int, Bicycle LOS Score for Intersection	1.936			2.137			2.326			2.253		
Bicycle LOS	A			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	30	0	166	108	99	255	0
Total Analysis Volume [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	18	0	0	19	0	73	92	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	62	62	27	93
g / C, Green / Cycle		0.08	0.08	0.56	0.56	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.05	0.07	0.17	0.24	0.22	0.27
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		153	153	2144	1016	435	3201
d1, Uniform Delay [s]		48.55	49.30	12.65	13.75	40.57	1.87
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.86	8.23	0.37	1.31	7.79	0.26
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.61	0.78	0.31	0.43	0.91	0.32
d, Delay for Lane Group [s/veh]		52.41	57.53	13.02	15.06	48.36	2.13
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.62	3.54	4.29	6.32	11.27	1.47
50th-Percentile Queue Length [ft/ln]		65.58	88.62	107.29	157.89	281.81	36.64
95th-Percentile Queue Length [veh/ln]		4.72	6.38	7.69	10.44	16.78	2.64
95th-Percentile Queue Length [ft/ln]		118.04	159.52	192.23	260.93	419.47	65.94

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.41	52.41	57.53	0.00	13.02	15.06	48.36	2.13	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.29			13.83			15.08		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	17.70											
Intersection LOS	B											
Intersection V/C	0.592											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.242	1.828	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	255	273	1600
d_b, Bicycle Delay [s]	55.00	41.89	41.02	2.20
I_b,int, Bicycle LOS Score for Intersection	4.132	1.909	2.162	2.729
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.620

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	0	100	0	0	0	45	157	0	0	228	36
Total Analysis Volume [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	60	0	0	0	0	0	31	50	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21		13	81	64	64
g / C, Green / Cycle	0.19	0.19	0.19		0.12	0.74	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.15		0.10	0.17	0.28	0.29
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	345	345	345		216	2795	1100	1042
d1, Uniform Delay [s]	42.72	42.51	42.27		47.34	4.61	13.48	13.77
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.17	4.51	3.92		8.34	0.19	1.49	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.78		0.84	0.23	0.48	0.51
d, Delay for Lane Group [s/veh]	47.89	47.02	46.19		55.67	4.80	14.98	15.53
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.93	7.63	7.32		5.33	2.03	7.73	7.94
50th-Percentile Queue Length [ft/ln]	198.23	190.76	182.91		133.26	50.79	193.27	198.50
95th-Percentile Queue Length [veh/ln]	12.55	12.16	11.75		9.12	3.66	12.29	12.56
95th-Percentile Queue Length [ft/ln]	313.68	304.02	293.81		227.92	91.43	307.27	314.03

**Movement, Approach, & Intersection Results**

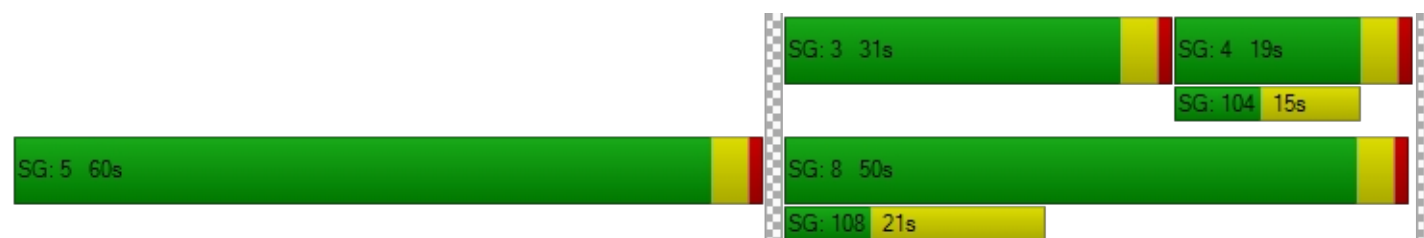
d_M, Delay for Movement [s/veh]	47.58	0.00	46.45	0.00	0.00	0.00	55.67	4.80	0.00	0.00	15.21	15.53
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	47.05			0.00			16.17			15.25		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	25.37											
Intersection LOS	C											
Intersection V/C	0.620											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.221	1.750	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	836	273
d_b, Bicycle Delay [s]	55.00	55.00	18.62	41.02
I_b,int, Bicycle LOS Score for Intersection	5.512	4.132	2.228	2.429
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	6.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	31	581	28	11	634	18	13	19	32	32	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	581	28	11	634	18	13	19	32	32	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	145	7	3	159	5	3	5	8	8	4	7
Total Analysis Volume [veh/h]	31	581	28	11	634	18	13	19	32	32	17	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	96	96	96	96	96	96	6	6
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.17	0.16	0.01	0.18	0.18	0.04	0.04
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1533	1656	1569	1537	1656	1569	139	146
d1, Uniform Delay [s]	0.92	1.08	1.08	0.91	1.10	1.10	50.80	51.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.26	0.26	0.01	0.28	0.29	2.35	2.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.19	0.19	0.01	0.20	0.20	0.46	0.52
d, Delay for Lane Group [s/veh]	0.94	1.34	1.34	0.92	1.37	1.38	53.16	53.99
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.04	0.50	0.48	0.01	0.55	0.52	1.81	2.18
50th-Percentile Queue Length [ft/ln]	1.07	12.61	11.89	0.37	13.66	12.96	45.35	54.38
95th-Percentile Queue Length [veh/ln]	0.08	0.91	0.86	0.03	0.98	0.93	3.26	3.92
95th-Percentile Queue Length [ft/ln]	1.92	22.70	21.40	0.67	24.58	23.33	81.62	97.88

**Movement, Approach, & Intersection Results**

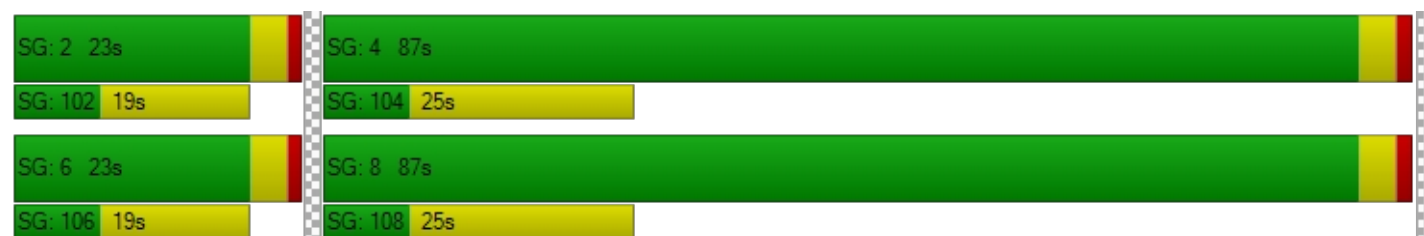
d_M, Delay for Movement [s/veh]	0.94	1.34	1.34	0.92	1.38	1.38	53.16	53.16	53.16	53.99	53.99	53.99
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.32			1.37			53.16			53.99		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	6.42											
Intersection LOS	A											
Intersection V/C	0.236											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.616			2.578			1.832			1.805		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.088			2.107			1.665			1.685		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	104	1068	112	108	883	192	191	412	94	134	444	199
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	1068	112	108	883	192	191	412	94	134	444	199
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	267	28	27	221	48	48	103	24	34	111	50
Total Analysis Volume [veh/h]	104	1068	112	108	883	192	191	412	94	134	444	199
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	52	0	15	57	0	15	33	0	10	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	46	36	36	46	37	37	56	45	45	56	43	43
g / C, Green / Cycle	0.42	0.33	0.33	0.42	0.33	0.33	0.51	0.41	0.41	0.51	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.06	0.28	0.06	0.06	0.30	0.28	0.11	0.11	0.05	0.07	0.12	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	342	1256	595	384	631	598	859	1559	739	876	1479	700
d1, Uniform Delay [s]	19.57	34.31	26.30	19.62	35.04	34.17	15.01	21.46	20.19	14.49	23.25	23.09
k, delay calibration	0.11	0.11	0.11	0.11	0.18	0.16	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.50	1.72	0.15	0.40	8.13	4.88	0.13	0.41	0.36	0.37	0.52	1.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.30	0.85	0.19	0.28	0.90	0.85	0.22	0.26	0.13	0.15	0.30	0.28
d, Delay for Lane Group [s/veh]	20.07	36.02	26.45	20.02	43.17	39.05	15.14	21.88	20.55	14.86	23.77	24.10
Lane Group LOS	C	D	C	C	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.68	13.36	2.12	1.75	15.65	13.17	2.64	3.58	1.57	1.86	4.07	3.73
50th-Percentile Queue Length [ft/ln]	42.07	333.96	53.12	43.63	391.36	329.15	65.92	89.58	39.31	46.40	101.76	93.13
95th-Percentile Queue Length [veh/ln]	3.03	19.35	3.82	3.14	22.14	19.12	4.75	6.45	2.83	3.34	7.33	6.71
95th-Percentile Queue Length [ft/ln]	75.73	483.81	95.62	78.53	553.58	477.92	118.66	161.25	70.76	83.52	183.16	167.64

**Movement, Approach, & Intersection Results**

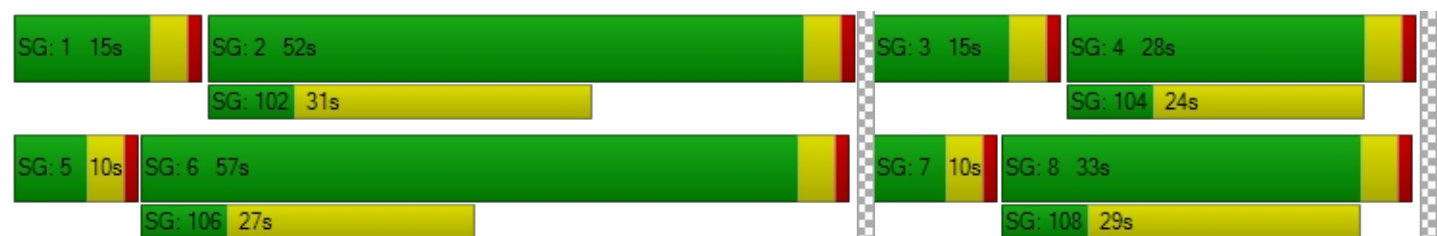
d_M, Delay for Movement [s/veh]	20.07	36.02	26.45	20.02	41.70	39.05	15.14	21.88	20.55	14.86	23.77	24.10
Movement LOS	C	D	C	C	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.90			39.29			19.85			22.32		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	30.75											
Intersection LOS	C											
Intersection V/C	0.604											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.933			2.935			2.748			2.745		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			964			527			436		
d_b, Bicycle Delay [s]	17.47			14.77			29.82			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.619			2.536			2.135			2.201		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	129	542	196	46	633	66	59	505	124	242	516	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	542	196	46	633	66	59	505	124	242	516	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	136	49	12	158	17	15	126	31	61	129	10
Total Analysis Volume [veh/h]	129	542	196	46	633	66	59	505	124	242	516	40
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	56	0	14	43	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25	24	24	24	5	54	54	10	59	59
g / C, Green / Cycle	0.23	0.23	0.23	0.22	0.22	0.22	0.05	0.49	0.49	0.09	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.07	0.14	0.11	0.03	0.19	0.19	0.03	0.13	0.07	0.07	0.14	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	229	880	417	261	417	395	84	1857	880	323	2031	962
d1, Uniform Delay [s]	35.01	37.91	36.47	34.42	41.50	41.19	51.75	16.60	15.46	48.74	13.81	12.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.17	0.71	0.82	0.32	5.88	5.06	10.30	0.36	0.34	3.51	0.30	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.62	0.47	0.18	0.87	0.85	0.70	0.27	0.14	0.75	0.25	0.04
d, Delay for Lane Group [s/veh]	37.18	38.61	37.30	34.74	47.38	46.25	62.05	16.96	15.79	52.24	14.11	12.29
Lane Group LOS	D	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.00	6.60	4.63	1.01	10.15	9.17	1.84	3.80	1.78	3.39	3.46	0.48
50th-Percentile Queue Length [ft/ln]	75.05	165.02	115.72	25.34	253.72	229.34	46.06	94.92	44.39	84.77	86.58	12.12
95th-Percentile Queue Length [veh/ln]	5.40	10.81	8.16	1.82	15.37	14.14	3.32	6.83	3.20	6.10	6.23	0.87
95th-Percentile Queue Length [ft/ln]	135.10	270.36	203.93	45.62	384.33	353.52	82.91	170.85	79.90	152.58	155.85	21.81

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	37.18	38.61	37.30	34.74	46.90	46.25	62.05	16.96	15.79	52.24	14.11	12.29
Movement LOS	D	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	38.10			46.09			20.62			25.58		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	32.92											
Intersection LOS	C											
Intersection V/C	0.502											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.766			2.580			2.783			2.829		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			709			473			473		
d_b, Bicycle Delay [s]	15.29			22.91			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.174			2.127			2.218		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.555

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	56	1186	33	39	1386	39	63	80	88	71	111	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	1186	33	39	1386	39	63	80	88	71	111	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	297	8	10	347	10	16	20	22	18	28	8
Total Analysis Volume [veh/h]	56	1186	33	39	1386	39	63	80	88	71	111	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	64	0	0	64	0	0	46	0	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.33	0.33	0.02	0.39	0.38	0.13	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1169	1483	1405	1223	1483	1405	306	78	264
d1, Uniform Delay [s]	2.73	3.96	3.94	2.71	4.32	4.30	45.80	41.56	43.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	0.89	0.93	0.05	1.19	1.23	3.79	28.32	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.42	0.42	0.03	0.50	0.49	0.75	0.90	0.55
d, Delay for Lane Group [s/veh]	2.81	4.85	4.87	2.75	5.50	5.53	49.58	69.88	45.14
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.25	3.97	3.73	0.17	5.07	4.77	6.45	2.33	3.75
50th-Percentile Queue Length [ft/ln]	6.16	99.14	93.15	4.23	126.84	119.33	161.31	58.19	93.73
95th-Percentile Queue Length [veh/ln]	0.44	7.14	6.71	0.30	8.77	8.36	10.62	4.19	6.75
95th-Percentile Queue Length [ft/ln]	11.09	178.46	167.66	7.61	219.19	208.90	265.46	104.73	168.71

**Movement, Approach, & Intersection Results**

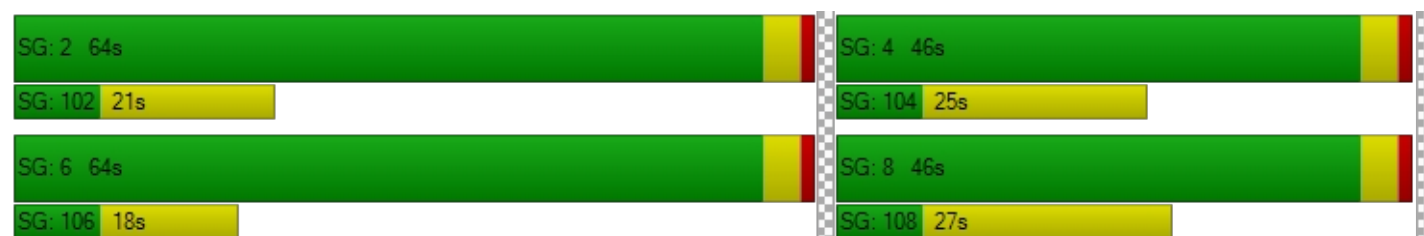
d_M, Delay for Movement [s/veh]	2.81	4.86	4.87	2.75	5.51	5.53	49.58	49.58	49.58	69.88	45.14	45.14
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.77			5.44			49.58			53.31		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.60											
Intersection LOS	B											
Intersection V/C	0.555											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.960			2.934			2.017			2.125		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1091			1091			764			764		
d_b, Bicycle Delay [s]	11.36			11.36			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.611			2.767			1.941			1.914		
Bicycle LOS	B			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.402

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	95	836	62	50	914	45	52	39	80	122	36	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	836	62	50	914	45	52	39	80	122	36	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	209	16	13	229	11	13	10	20	31	9	11
Total Analysis Volume [veh/h]	95	836	62	50	914	45	52	39	80	122	36	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.05	0.25	0.24	0.03	0.26	0.26	0.10	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1328	1516	1436	1338	1516	1436	276	286
d1, Uniform Delay [s]	2.37	2.98	2.95	2.31	3.04	3.02	46.00	46.83
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.53	0.54	0.05	0.58	0.59	2.28	3.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.31	0.30	0.04	0.33	0.32	0.62	0.70
d, Delay for Lane Group [s/veh]	2.47	3.50	3.49	2.36	3.62	3.62	48.27	49.94
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.37	2.26	2.08	0.19	2.46	2.29	4.65	5.58
50th-Percentile Queue Length [ft/ln]	9.23	56.53	52.08	4.72	61.46	57.20	116.27	139.43
95th-Percentile Queue Length [veh/ln]	0.66	4.07	3.75	0.34	4.43	4.12	8.19	9.45
95th-Percentile Queue Length [ft/ln]	16.61	101.75	93.74	8.50	110.63	102.96	204.69	236.25

**Movement, Approach, & Intersection Results**

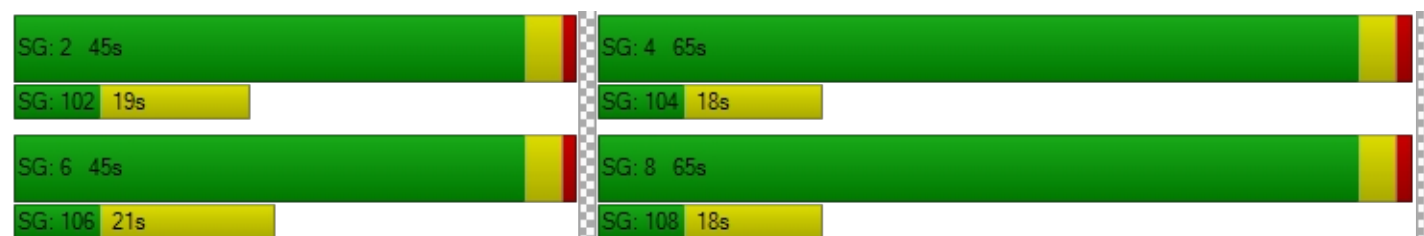
d_M, Delay for Movement [s/veh]	2.47	3.50	3.49	2.36	3.62	3.62	48.27	48.27	48.27	49.94	49.94	49.94
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.40			3.55			48.27			49.94		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.62											
Intersection LOS	B											
Intersection V/C	0.402											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.894			2.761			2.029			1.967		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.379			2.392			1.842			1.890		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	203	1176	261	266	1199	208	257	748	312	249	829	234
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1176	261	266	1199	208	257	748	312	249	829	234
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	294	65	67	300	52	64	187	78	62	207	59
Total Analysis Volume [veh/h]	203	1176	261	266	1199	208	257	748	312	249	829	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	38	0	14	41	0	21	39	0	19	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	34	34	10	37	37	17	35	35	15	33	33
g / C, Green / Cycle	0.06	0.31	0.31	0.09	0.34	0.34	0.16	0.32	0.32	0.14	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.31	0.15	0.08	0.30	0.14	0.14	0.13	0.17	0.14	0.15	0.13
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1173	556	318	1277	605	281	1804	570	249	1703	538
d1, Uniform Delay [s]	51.19	38.02	30.75	49.19	34.85	28.19	45.69	29.58	31.09	47.37	31.64	31.08
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.40	12.83	0.62	5.77	2.73	0.46	11.43	0.71	3.76	26.18	1.00	2.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.91	1.00	0.47	0.84	0.91	0.42	0.91	0.41	0.55	1.00	0.49	0.43
d, Delay for Lane Group [s/veh]	64.59	50.85	31.36	54.96	37.58	28.65	57.13	30.29	34.85	73.56	32.64	33.63
Lane Group LOS	E	F	C	D	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.19	17.56	5.66	3.84	14.93	5.16	7.76	5.28	7.38	8.59	6.15	5.36
50th-Percentile Queue Length [ft/ln]	79.67	438.96	141.54	95.96	373.24	129.12	194.10	131.96	184.53	214.86	153.72	134.11
95th-Percentile Queue Length [veh/ln]	5.74	24.47	9.56	6.91	21.27	8.89	12.33	9.05	11.84	13.40	10.22	9.16
95th-Percentile Queue Length [ft/ln]	143.40	611.80	239.10	172.72	531.66	222.30	308.34	226.16	295.92	335.06	255.38	229.08

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	64.59	50.85	31.36	54.96	37.26	28.65	57.13	30.29	34.85	73.56	32.64	33.63
Movement LOS	E	F	C	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	49.45			39.00			36.61			40.58		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	41.70											
Intersection LOS	D											
Intersection V/C	0.816											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.149			3.069			3.047			3.050		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	618			673			636			600		
d_b, Bicycle Delay [s]	26.25			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.913			2.480			2.284			2.281		
Bicycle LOS	C			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	296	845	120	175	845	168	194	718	272	200	662	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	296	845	120	175	845	168	194	718	272	200	662	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	211	30	44	211	42	49	180	68	50	166	43
Total Analysis Volume [veh/h]	296	845	120	175	845	168	194	718	272	200	662	170
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	47	0	13	48	0	15	40	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	29	29	42	30	30	14	48	48	9	42	42
g / C, Green / Cycle	0.38	0.26	0.26	0.38	0.27	0.27	0.13	0.43	0.43	0.08	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.16	0.22	0.07	0.10	0.22	0.09	0.11	0.19	0.15	0.06	0.23	0.22
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	406	992	470	402	1026	486	229	1642	778	275	729	690
d1, Uniform Delay [s]	25.31	38.68	32.23	23.42	37.75	32.38	47.06	21.91	20.93	49.63	27.31	26.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.53	2.18	0.28	0.74	1.73	0.42	8.44	0.85	1.24	3.69	3.74	3.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	0.85	0.26	0.43	0.82	0.35	0.85	0.44	0.35	0.73	0.61	0.56
d, Delay for Lane Group [s/veh]	27.83	40.85	32.51	24.16	39.48	32.80	55.49	22.76	22.17	53.33	31.05	30.05
Lane Group LOS	C	D	C	C	D	C	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.98	11.01	2.57	3.20	10.81	3.66	5.72	6.59	4.90	2.83	9.95	8.55
50th-Percentile Queue Length [ft/ln]	149.62	275.37	64.32	80.04	270.30	91.51	142.91	164.68	122.40	70.64	248.81	213.87
95th-Percentile Queue Length [veh/ln]	10.00	16.46	4.63	5.76	16.20	6.59	9.64	10.80	8.52	5.09	15.13	13.35
95th-Percentile Queue Length [ft/ln]	249.92	411.45	115.77	144.08	405.11	164.71	240.94	269.91	213.12	127.15	378.16	333.80

**Movement, Approach, & Intersection Results**

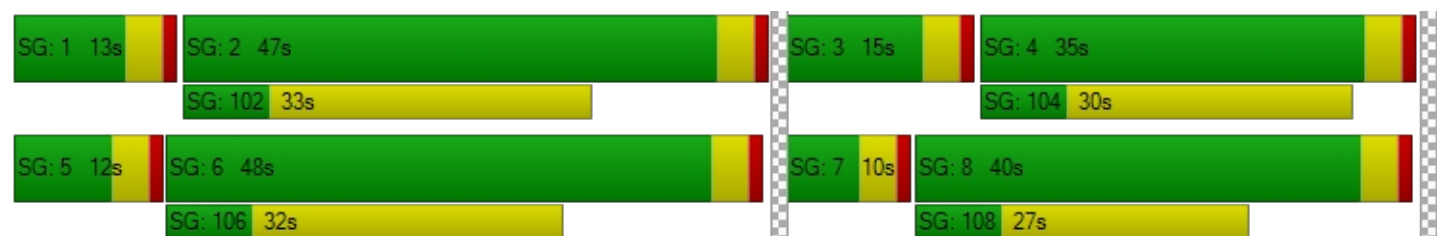
d_M, Delay for Movement [s/veh]	27.83	40.85	32.51	24.16	39.48	32.80	55.49	22.76	22.17	53.33	30.72	30.05
Movement LOS	C	D	C	C	D	C	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	37.00			36.28			27.99			34.99		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	34.08											
Intersection LOS	C											
Intersection V/C	0.788											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.881			2.852			2.976			2.958		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			800			655			564		
d_b, Bicycle Delay [s]	20.40			19.80			24.89			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.600			2.540			2.211			2.411		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 22: Harbor Boulevard at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.707

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	410	0	0	350	170	0	0	0	55	89	92
Total Analysis Volume [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	68	58	58		24	24	24
g / C, Green / Cycle	0.06	0.68	0.58	0.58		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.37	0.39		0.12	0.09	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3880	2213	1048		431	909	431
d1, Uniform Delay [s]	45.82	7.15	13.74	14.20		32.92	31.91	36.35
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.34	1.36	3.29		0.92	0.27	4.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.42	0.63	0.66		0.51	0.39	0.85
d, Delay for Lane Group [s/veh]	48.19	7.49	15.10	17.49		33.85	32.18	41.20
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	4.71	9.94	10.79		4.64	3.60	8.99
50th-Percentile Queue Length [ft/ln]	35.98	117.77	248.39	269.79		115.91	89.90	224.81
95th-Percentile Queue Length [veh/ln]	2.59	8.27	15.10	16.18		8.17	6.47	13.91
95th-Percentile Queue Length [ft/ln]	64.76	206.76	377.62	404.47		204.20	161.83	347.76

**Movement, Approach, & Intersection Results**

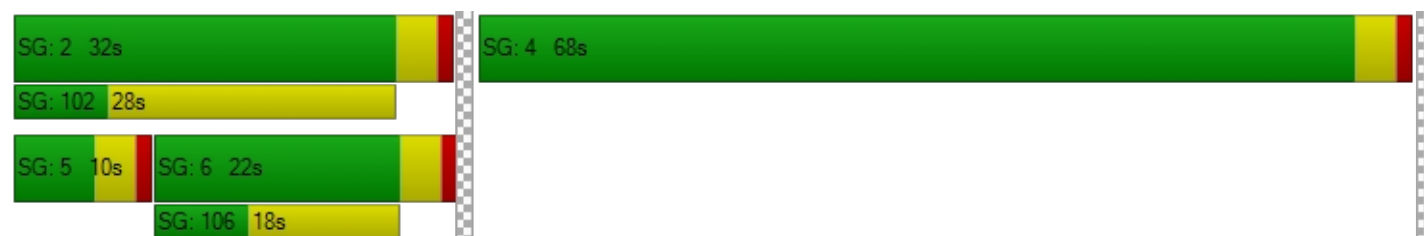
d_M, Delay for Movement [s/veh]	48.19	7.49	0.00	0.00	15.12	17.49	0.00	0.00	0.00	33.85	32.18	41.20
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	10.14			15.90			0.00			36.09		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.76											
Intersection LOS	B											
Intersection V/C	0.707											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.280			2.365		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.524			2.705			4.132			2.334		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	215	0	0	284	82	0	0	0	33	137	190
Total Analysis Volume [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	44	0	0	33	0	0	0	0	0	56	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	47	36	36		45	45	45
g / C, Green / Cycle	0.07	0.47	0.36	0.36		0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.26	0.27		0.19	0.18	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	2654	1348	638		818	863	818
d1, Uniform Delay [s]	45.79	16.81	28.02	28.57		18.42	18.09	25.78
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.33
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.32	3.41	8.47		0.35	0.29	13.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.32	0.72	0.76		0.42	0.39	0.93
d, Delay for Lane Group [s/veh]	57.11	17.14	31.43	37.04		18.76	18.37	39.32
Lane Group LOS	E	B	C	D		B	B	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	4.11	10.51	11.56		5.32	5.09	19.25
50th-Percentile Queue Length [ft/ln]	72.68	102.68	262.70	289.11		133.07	127.23	481.31
95th-Percentile Queue Length [veh/ln]	5.23	7.39	15.82	17.14		9.11	8.79	26.45
95th-Percentile Queue Length [ft/ln]	130.82	184.82	395.61	428.54		227.66	219.72	661.20

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.11	17.14	0.00	0.00	32.22	37.04	0.00	0.00	0.00	18.76	18.52	39.32
Movement LOS	E	B			C	D				B	B	D
d_A, Approach Delay [s/veh]	21.42			33.30			0.00			29.51		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	28.93											
Intersection LOS	C											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.197			2.414		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			580			0			1040		
d_b, Bicycle Delay [s]	18.00			25.21			50.00			11.52		
I_b,int, Bicycle LOS Score for Intersection	2.088			2.365			4.132			2.750		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.636

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	256	69	125	288	0	208	52	46	0	0	0
Total Analysis Volume [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	28	57	0	0	43	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	43	43	17	64	28	28	28	
g / C, Green / Cycle	0.43	0.43	0.17	0.64	0.28	0.28	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.24	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2471	780	590	3660	973	528	500	
d1, Uniform Delay [s]	19.56	18.96	40.31	8.03	34.17	29.24	29.00	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	1.26	3.44	0.23	2.25	0.47	0.44	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.35	0.85	0.32	0.85	0.39	0.36	
d, Delay for Lane Group [s/veh]	20.08	20.21	43.75	8.26	36.42	29.71	29.45	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.46	4.46	6.16	3.48	9.65	4.04	3.54	
50th-Percentile Queue Length [ft/ln]	136.61	111.54	154.10	86.93	241.16	100.93	88.47	
95th-Percentile Queue Length [veh/ln]	9.30	7.93	10.24	6.26	14.74	7.27	6.37	
95th-Percentile Queue Length [ft/ln]	232.45	198.14	255.90	156.48	368.50	181.67	159.25	

**Movement, Approach, & Intersection Results**

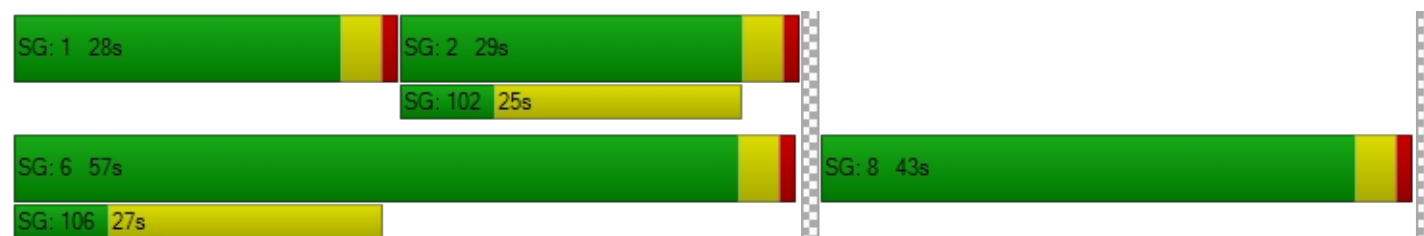
d_M, Delay for Movement [s/veh]	0.00	20.08	20.21	43.75	8.26	0.00	36.42	29.71	29.45	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	20.11			18.98			34.24			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	23.79											
Intersection LOS	C											
Intersection V/C	0.636											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.433			2.198		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1060			780			0		
d_b, Bicycle Delay [s]	28.13			11.05			18.61			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.468			3.569			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	159	43	149	189	0	48	190	16	0	0	0
Total Analysis Volume [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	26	49	0	0	51	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	19	62	30	30	30	
g / C, Green / Cycle	0.39	0.39	0.19	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.17	0.20	0.27	0.25	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1471	697	676	2357	539	569	539	
d1, Uniform Delay [s]	21.88	22.09	39.25	9.00	33.44	32.59	25.42	
k, delay calibration	0.50	0.50	0.11	0.50	0.14	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.71	1.62	4.04	0.36	6.76	3.22	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.37	0.39	0.88	0.32	0.89	0.83	0.12	
d, Delay for Lane Group [s/veh]	22.59	23.71	43.28	9.36	40.21	35.81	25.51	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.59	4.80	7.41	3.74	11.86	10.86	1.10	
50th-Percentile Queue Length [ft/ln]	114.67	119.93	185.20	93.48	296.43	271.51	27.40	
95th-Percentile Queue Length [veh/ln]	8.10	8.39	11.87	6.73	17.50	16.27	1.97	
95th-Percentile Queue Length [ft/ln]	202.48	209.73	296.79	168.27	437.61	406.63	49.33	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	22.76	23.71	43.28	9.36	0.00	40.21	37.49	25.51	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.96			24.32			37.25			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.10											
Intersection LOS	C											
Intersection V/C	0.667											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.274			2.465		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			900			940			0		
d_b, Bicycle Delay [s]	32.81			15.13			14.05			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.005			2.677			2.395			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	42	319	12	5	521
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	42	319	12	5	521
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	11	80	3	1	130
Total Analysis Volume [veh/h]	0	42	319	12	5	521
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**


V/C, Movement V/C Ratio	0.00	0.06	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	10.30	0.00	0.00	7.94	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.18	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	4.62	0.00	0.00	0.31	0.00
d_A, Approach Delay [s/veh]	10.30		0.00		0.08	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.53					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.232

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	462	46	17	409	0	30	0	63	114	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	462	46	17	409	0	30	0	63	114	0	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	116	12	4	102	0	8	0	16	29	0	12
Total Analysis Volume [veh/h]	0	462	46	17	409	0	30	0	63	114	0	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	48	0	10	58	0	0	52	0	52	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	93	93	9	9	9	9
g / C, Green / Cycle	0.79	0.79	0.85	0.85	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.01	0.11	0.02	0.04	0.06	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1492	1414	1540	3210	184	181	126	148
d1, Uniform Delay [s]	2.92	2.95	1.34	1.48	47.08	47.97	49.42	47.51
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	0.28	0.00	0.08	0.41	1.14	20.43	1.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.18	0.01	0.13	0.16	0.35	0.91	0.31
d, Delay for Lane Group [s/veh]	3.17	3.23	1.34	1.57	47.49	49.12	69.86	48.68
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.17	1.19	0.03	0.46	0.79	1.70	3.77	1.24
50th-Percentile Queue Length [ft/ln]	29.33	29.73	0.82	11.51	19.71	42.49	94.36	30.90
95th-Percentile Queue Length [veh/ln]	2.11	2.14	0.06	0.83	1.42	3.06	6.79	2.22
95th-Percentile Queue Length [ft/ln]	52.79	53.52	1.48	20.73	35.48	76.48	169.84	55.61

**Movement, Approach, & Intersection Results**

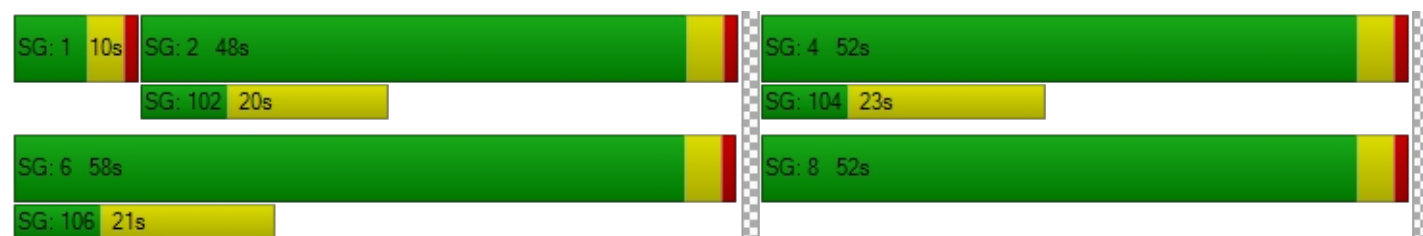
d_M, Delay for Movement [s/veh]	0.00	3.20	3.23	1.34	1.57	0.00	47.49	49.12	49.12	69.86	0.00	48.68
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	3.20			1.56			48.59			63.77		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.33											
Intersection LOS	B											
Intersection V/C	0.232											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.540			1.770			2.042		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			982			873			0		
d_b, Bicycle Delay [s]	19.80			14.25			17.47			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.979			1.911			1.713			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.048

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	2	392	277	1	28	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	392	277	1	28	5
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	98	69	0	7	1
Total Analysis Volume [veh/h]	2	392	277	1	28	5
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.05	0.01
d_M, Delay for Movement [s/veh]	7.81	0.00	0.00	0.00	11.49	10.07
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft/ln]	0.12	0.00	0.00	0.00	4.31	4.31
d_A, Approach Delay [s/veh]	0.04		0.00		11.28	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	44	389	285	1	8	104
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	389	285	1	8	104
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	97	71	0	2	26
Total Analysis Volume [veh/h]	44	389	285	1	8	104
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**




V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.02	0.14
d_M, Delay for Movement [s/veh]	7.92	0.00	0.00	0.00	12.69	10.67
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.54	0.54
95th-Percentile Queue Length [ft/ln]	2.68	0.00	0.00	0.00	13.47	13.47
d_A, Approach Delay [s/veh]	0.80		0.00		10.81	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.88					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	411	33	22	294	30	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	411	33	22	294	30	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	8	6	74	8	5
Total Analysis Volume [veh/h]	411	33	22	294	30	18
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	8.29	0.00	12.17	11.31
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.27	0.27
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.51	0.00	6.82	6.82
d_A, Approach Delay [s/veh]	0.00		0.58		11.85	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.93					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.058

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	489	19	0	409	6	0	0	28	0	0	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	489	19	0	409	6	0	0	28	0	0	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	122	5	0	102	2	0	0	7	0	0	11
Total Analysis Volume [veh/h]	6	489	19	0	409	6	0	0	28	0	0	43
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.06
d_M, Delay for Movement [s/veh]	8.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.67	0.00	0.00	10.13
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.18
95th-Percentile Queue Length [ft/ln]	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72	0.00	0.00	4.58
d_A, Approach Delay [s/veh]	0.10			0.00			9.67			10.13		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	0.76											
Intersection LOS	B											





*APPENDIX F-III*

**YEAR 2020 CUMULATIVE SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.420

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	100	547	68	166	506	160	162	667	88	148	693	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	547	68	166	506	160	162	667	88	148	693	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	137	17	42	127	40	41	167	22	37	173	42
Total Analysis Volume [veh/h]	100	547	68	166	506	160	162	667	88	148	693	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	16	45	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	59	59	6	59	59	12	22	22	7	17	17
g / C, Green / Cycle	0.05	0.54	0.54	0.05	0.54	0.54	0.11	0.20	0.20	0.06	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.10	0.04	0.05	0.12	0.12	0.09	0.13	0.14	0.04	0.12	0.09
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	183	3059	966	192	2049	971	189	772	366	210	901	284
d1, Uniform Delay [s]	50.87	13.06	12.27	51.60	13.25	13.26	48.41	40.27	40.60	50.76	44.40	42.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.54	0.13	0.14	11.11	0.25	0.52	10.53	0.94	2.30	4.29	1.42	1.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.18	0.07	0.87	0.22	0.22	0.86	0.65	0.69	0.71	0.77	0.59
d, Delay for Lane Group [s/veh]	53.42	13.19	12.41	62.71	13.50	13.78	58.95	41.21	42.89	55.05	45.82	44.91
Lane Group LOS	D	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	2.31	0.84	2.56	2.94	2.87	4.91	6.33	6.50	2.12	6.13	4.36
50th-Percentile Queue Length [ft/ln]	35.18	57.79	20.88	64.04	73.56	71.65	122.65	158.27	162.42	53.05	153.19	108.96
95th-Percentile Queue Length [veh/ln]	2.53	4.16	1.50	4.61	5.30	5.16	8.54	10.46	10.68	3.82	10.19	7.78
95th-Percentile Queue Length [ft/ln]	63.32	104.02	37.58	115.26	132.41	128.96	213.46	261.43	266.93	95.49	254.68	194.55



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	53.42	13.19	12.41	62.71	13.53	13.78	58.95	41.62	42.89	55.05	45.82	44.91
Movement LOS	D	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	18.74			23.39			44.80			47.02		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	34.95											
Intersection LOS	C											
Intersection V/C	0.420											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.017			2.943			2.864			3.066		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			745			691		
d_b, Bicycle Delay [s]	23.56			23.56			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.953			2.017			2.064			2.114		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.452

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	18	648	524	51	729	20	37	98	15	526	68	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	648	524	51	729	20	37	98	15	526	68	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	162	131	13	182	5	9	25	4	132	17	0
Total Analysis Volume [veh/h]	18	648	524	51	729	20	37	98	15	526	68	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	60	5	62	62	8	8	8	21	21
g / C, Green / Cycle	0.02	0.55	0.04	0.57	0.57	0.07	0.07	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.11	0.03	0.16	0.08	0.02	0.05	0.01	0.16	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	43	3115	79	2152	1020	129	136	129	347	347
d1, Uniform Delay [s]	52.95	12.77	51.78	12.30	11.27	48.44	50.03	47.85	42.94	43.03
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.19	0.15	8.41	0.32	0.30	1.21	6.97	0.40	5.95	6.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.21	0.64	0.28	0.14	0.29	0.72	0.12	0.85	0.86
d, Delay for Lane Group [s/veh]	59.14	12.93	60.19	12.62	11.57	49.65	57.00	48.24	48.90	49.36
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.56	2.71	1.57	3.79	1.74	1.01	2.90	0.40	8.28	8.41
50th-Percentile Queue Length [ft/ln]	14.12	67.79	39.21	94.86	43.46	25.17	72.48	10.00	207.04	210.37
95th-Percentile Queue Length [veh/ln]	1.02	4.88	2.82	6.83	3.13	1.81	5.22	0.72	13.00	13.17
95th-Percentile Queue Length [ft/ln]	25.42	122.02	70.58	170.75	78.23	45.31	130.47	18.00	325.03	329.31

**Movement, Approach, & Intersection Results**

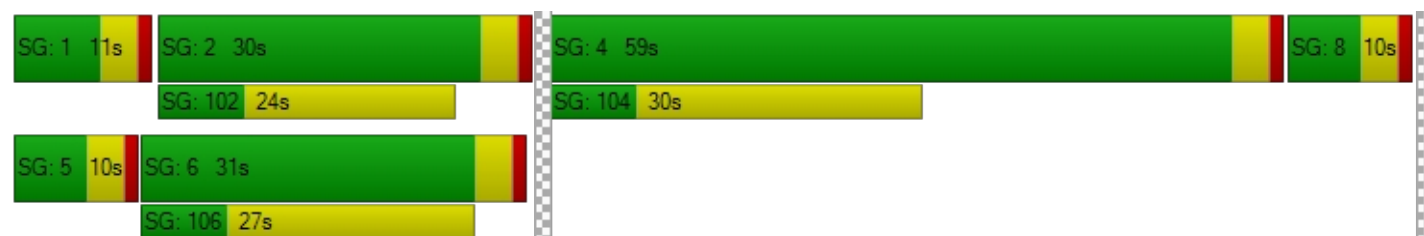
d_M, Delay for Movement [s/veh]	59.14	12.93	0.00	60.19	12.44	11.57	49.65	57.00	48.24	49.10	49.36	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	14.17			15.46			54.31			49.13		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.76											
Intersection LOS	C											
Intersection V/C	0.452											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	2.810	2.203	2.191
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	473	491	109	1000
d_b, Bicycle Delay [s]	32.07	31.31	49.16	13.75
I_b,int, Bicycle LOS Score for Intersection	1.926	2.000	1.807	2.540
Bicycle LOS	A	A	A	B

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	16.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.493

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	66	998	35	129	1129	14	31	65	66	46	93	207
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	998	35	129	1129	14	31	65	66	46	93	207
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	250	9	32	282	4	8	16	17	12	23	52
Total Analysis Volume [veh/h]	66	998	35	129	1129	14	31	65	66	46	93	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	11	62	0	11	62	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	77	77	7	79	79	14	14	14	14	14	25
g / C, Green / Cycle	0.05	0.70	0.70	0.06	0.72	0.72	0.13	0.13	0.13	0.13	0.13	0.23
(v / s)_i Volume / Saturation Flow Rate	0.04	0.28	0.28	0.04	0.30	0.01	0.02	0.03	0.04	0.03	0.05	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	88	1331	1261	229	2723	1290	181	238	225	206	238	408
d1, Uniform Delay [s]	51.60	6.86	6.83	49.86	6.28	4.45	42.81	43.56	43.68	43.18	44.24	37.13
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.84	0.90	0.93	2.18	0.47	0.02	0.44	0.61	0.71	0.54	1.05	0.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.40	0.40	0.56	0.41	0.01	0.17	0.27	0.29	0.22	0.39	0.51
d, Delay for Lane Group [s/veh]	63.44	7.76	7.76	52.04	6.74	4.46	43.25	44.18	44.39	43.72	45.29	38.11
Lane Group LOS	E	A	A	D	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.08	4.97	4.65	1.79	4.80	0.09	0.77	1.64	1.68	1.16	2.40	4.96
50th-Percentile Queue Length [ft/ln]	52.12	124.25	116.16	44.75	119.88	2.17	19.35	41.11	41.94	28.90	59.99	124.11
95th-Percentile Queue Length [veh/ln]	3.75	8.63	8.18	3.22	8.39	0.16	1.39	2.96	3.02	2.08	4.32	8.62
95th-Percentile Queue Length [ft/ln]	93.81	215.65	204.53	80.54	209.66	3.90	34.83	74.00	75.49	52.02	107.98	215.46



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.44	7.76	7.76	52.04	6.74	4.46	43.25	44.18	44.39	43.72	45.29	38.11
Movement LOS	E	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.11			11.31			44.09			40.78		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	16.62											
Intersection LOS	B											
Intersection V/C	0.493											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.831			2.997			2.222			2.422		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1055			1055			600			600		
d_b, Bicycle Delay [s]	12.29			12.29			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.466			2.609			1.827			2.131		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.377

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	129	195	43	62	223	27	16	169	84	57	196	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	195	43	62	223	27	16	169	84	57	196	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	49	11	16	56	7	4	42	21	14	49	16
Total Analysis Volume [veh/h]	129	195	43	62	223	27	16	169	84	57	196	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	36	0	0	44	0	0	30	30	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	12	12	59	12	12	12
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.39	0.11	0.11	0.54	0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.02	0.03	0.14	0.01	0.09	0.05	0.03	0.07	0.07
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	702	702	702	702	702	123	211	967	90	211	200
d1, Uniform Delay [s]	22.03	22.94	20.95	21.18	23.75	43.80	47.64	12.33	44.83	46.74	46.57
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.58	0.98	0.17	0.25	1.41	0.47	6.86	0.18	7.19	3.24	3.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.28	0.06	0.09	0.36	0.13	0.80	0.09	0.63	0.64	0.61
d, Delay for Lane Group [s/veh]	22.61	23.92	21.12	21.43	25.17	44.27	54.51	12.51	52.01	49.98	49.59
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.30	3.63	0.73	1.06	4.84	0.41	4.91	1.04	1.61	3.73	3.36
50th-Percentile Queue Length [ft/ln]	57.49	90.84	18.15	26.48	121.12	10.20	122.66	25.98	40.22	93.34	83.95
95th-Percentile Queue Length [veh/ln]	4.14	6.54	1.31	1.91	8.45	0.73	8.54	1.87	2.90	6.72	6.04
95th-Percentile Queue Length [ft/ln]	103.48	163.52	32.67	47.66	211.36	18.37	213.48	46.76	72.39	168.00	151.12

**Movement, Approach, & Intersection Results**

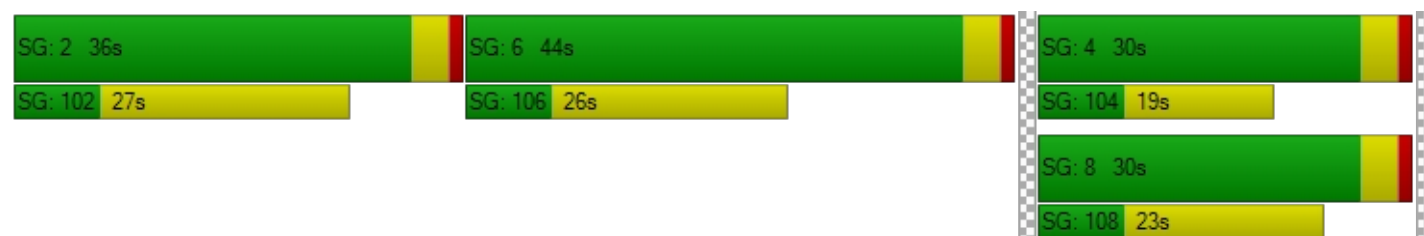
d_M, Delay for Movement [s/veh]	22.61	23.92	21.12	21.43	25.17	25.17	44.27	54.51	12.51	52.01	49.86	49.59
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	23.13			24.42			40.78			50.20		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.96											
Intersection LOS	C											
Intersection V/C	0.377											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.400			2.163			2.431			2.284		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			727			473			473		
d_b, Bicycle Delay [s]	27.65			22.27			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.165			2.074			2.003			1.819		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.192

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	126	93	205	180	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	126	93	205	180	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	32	23	51	45	3
Total Analysis Volume [veh/h]	16	126	93	205	180	11
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.11	0.09	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	160	160	1496	1593	1593	1509
d1, Uniform Delay [s]	46.00	49.03	1.51	1.61	1.59	1.44
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	8.32	0.08	0.17	0.14	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.06	0.13	0.11	0.01
d, Delay for Lane Group [s/veh]	46.27	57.34	1.59	1.78	1.73	1.45
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.41	3.75	0.23	0.55	0.47	0.03
50th-Percentile Queue Length [ft/ln]	10.36	93.69	5.86	13.63	11.79	0.66
95th-Percentile Queue Length [veh/ln]	0.75	6.75	0.42	0.98	0.85	0.05
95th-Percentile Queue Length [ft/ln]	18.65	168.64	10.55	24.54	21.23	1.19



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	46.27	57.34	1.59	1.78	1.73	1.45
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	56.09		1.72		1.71	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	13.95					
Intersection LOS	B					
Intersection V/C	0.192					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.162	2.146	2.084
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.624	4.448
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 85s

SG: 4 25s

SG: 101 26s

SG: 104 21s

SG: 8 25s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.403

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	43	1004	24	21	1007	56	57	58	59	30	29	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	1004	24	21	1007	56	57	58	59	30	29	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	251	6	5	252	14	14	15	15	8	7	8
Total Analysis Volume [veh/h]	43	1004	24	21	1007	56	57	58	59	30	29	30
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	56	0	10	56	0	12	34	0	10	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	88	81	81	88	80	80	14	6	6	14	5	5
g / C, Green / Cycle	0.80	0.74	0.74	0.80	0.72	0.72	0.13	0.06	0.06	0.13	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.28	0.28	0.01	0.29	0.28	0.03	0.03	0.03	0.02	0.02	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1319	1400	1326	1339	1373	1301	302	111	105	274	87	83
d1, Uniform Delay [s]	2.27	5.29	5.27	2.24	5.96	5.91	43.22	50.34	50.46	42.56	50.85	50.92
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.78	0.81	0.00	0.88	0.90	0.30	3.80	4.66	0.17	2.19	2.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.03	0.38	0.38	0.02	0.40	0.39	0.19	0.52	0.56	0.11	0.33	0.36
d, Delay for Lane Group [s/veh]	2.31	6.07	6.09	2.24	6.83	6.81	43.52	54.14	55.12	42.74	53.04	53.56
Lane Group LOS	A	A	A	A	A	A	D	D	E	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.16	4.08	3.84	0.07	4.65	4.31	1.43	1.67	1.72	0.74	0.83	0.86
50th-Percentile Queue Length [ft/ln]	3.98	102.06	95.96	1.76	116.36	107.75	35.63	41.67	42.90	18.47	20.68	21.56
95th-Percentile Queue Length [veh/ln]	0.29	7.35	6.91	0.13	8.19	7.71	2.57	3.00	3.09	1.33	1.49	1.55
95th-Percentile Queue Length [ft/ln]	7.16	183.72	172.72	3.17	204.82	192.87	64.13	75.00	77.22	33.25	37.22	38.81

**Movement, Approach, & Intersection Results**

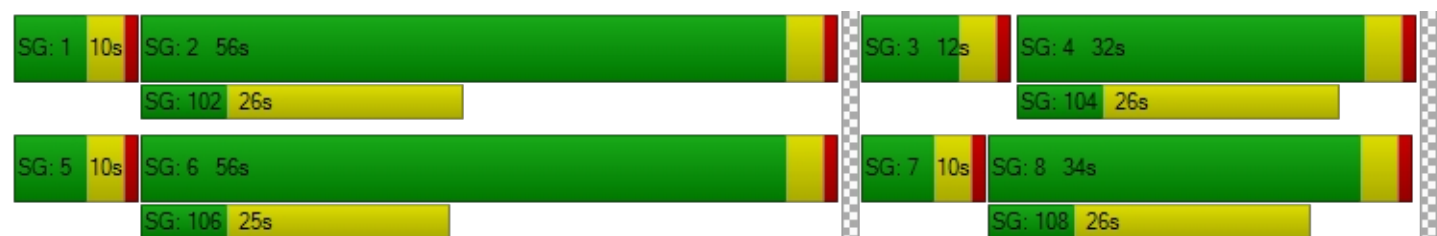
d_M, Delay for Movement [s/veh]	2.31	6.08	6.09	2.24	6.82	6.81	43.52	54.14	55.12	42.74	53.04	53.56
Movement LOS	A	A	A	A	A	A	D	D	E	D	D	D
d_A, Approach Delay [s/veh]	5.93			6.73			50.99			49.74		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.14											
Intersection LOS	B											
Intersection V/C	0.403											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.735			2.739			2.414			2.369		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			945			545			509		
d_b, Bicycle Delay [s]	15.29			15.29			29.09			30.56		
I_b,int, Bicycle LOS Score for Intersection	2.443			2.454			1.703			1.633		
Bicycle LOS	B			B			A			A		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	111	947	120	138	856	135	198	420	111	209	460	103
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	947	120	138	856	135	198	420	111	209	460	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	237	30	35	214	34	50	105	28	52	115	26
Total Analysis Volume [veh/h]	111	947	120	138	856	135	198	420	111	209	460	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	15	58	0	11	54	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	70	60	60	70	60	60	32	21	21	32	17	17
g / C, Green / Cycle	0.64	0.55	0.55	0.64	0.55	0.55	0.29	0.19	0.19	0.29	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.06	0.29	0.28	0.08	0.27	0.26	0.11	0.15	0.14	0.12	0.12	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	924	1040	985	891	1042	987	412	358	339	366	578	274
d1, Uniform Delay [s]	7.67	15.97	15.72	7.80	15.46	15.19	31.27	42.60	42.09	31.48	45.02	41.97
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	1.99	1.93	0.08	1.71	1.65	0.87	3.89	3.09	1.41	2.54	0.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.54	0.52	0.15	0.50	0.48	0.48	0.79	0.73	0.57	0.80	0.38
d, Delay for Lane Group [s/veh]	7.94	17.95	17.65	7.88	17.18	16.84	32.14	46.49	45.19	32.89	47.56	42.82
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.03	9.21	8.28	1.24	8.31	7.38	4.30	7.65	6.63	4.60	6.23	2.58
50th-Percentile Queue Length [ft/ln]	25.83	230.29	206.89	30.98	207.80	184.62	107.41	191.33	165.66	115.10	155.83	64.55
95th-Percentile Queue Length [veh/ln]	1.86	14.19	12.99	2.23	13.04	11.84	7.70	12.19	10.85	8.12	10.33	4.65
95th-Percentile Queue Length [ft/ln]	46.50	354.72	324.83	55.76	326.00	296.04	192.40	304.76	271.20	203.07	258.20	116.19



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	7.94	17.83	17.65	7.88	17.05	16.84	32.14	46.06	45.19	32.89	47.56	42.82
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	16.88			15.90			42.15			42.96		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.71											
Intersection LOS	C											
Intersection V/C	0.664											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.830			2.821			2.679			2.809		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			982			909		
d_b, Bicycle Delay [s]	31.31			31.31			14.25			16.36		
I_b,int, Bicycle LOS Score for Intersection	2.531			2.491			2.161			2.197		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	33.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	100	292	93	74	320	117	110	525	118	118	530	39
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	292	93	74	320	117	110	525	118	118	530	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	73	23	19	80	29	28	131	30	30	133	10
Total Analysis Volume [veh/h]	100	292	93	74	320	117	110	525	118	118	530	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	33	0	11	29	0	15	53	0	13	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	70	60	60	70	60	60	8	23	23	6	20	20
g / C, Green / Cycle	0.63	0.55	0.55	0.63	0.54	0.54	0.08	0.21	0.21	0.05	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.05	0.04	0.12	0.11	0.06	0.18	0.17	0.03	0.14	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1106	2070	981	1155	1029	975	138	392	371	189	697	330
d1, Uniform Delay [s]	7.94	12.35	12.03	7.82	13.17	13.04	49.98	42.26	41.70	51.00	42.67	37.53
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.14	0.19	0.02	0.51	0.49	9.91	5.97	4.40	3.37	1.75	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.14	0.09	0.06	0.23	0.21	0.80	0.87	0.82	0.63	0.76	0.12
d, Delay for Lane Group [s/veh]	8.10	12.50	12.22	7.84	13.68	13.53	59.89	48.23	46.10	54.37	44.42	37.69
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.94	1.78	1.13	0.65	3.09	2.69	3.35	9.52	8.24	1.68	6.97	0.90
50th-Percentile Queue Length [ft/ln]	23.42	44.51	28.27	16.35	77.15	67.25	83.76	237.95	205.91	41.98	174.30	22.38
95th-Percentile Queue Length [veh/ln]	1.69	3.20	2.04	1.18	5.55	4.84	6.03	14.58	12.94	3.02	11.30	1.61
95th-Percentile Queue Length [ft/ln]	42.16	80.12	50.89	29.43	138.87	121.04	150.78	364.45	323.58	75.56	282.56	40.28

**Movement, Approach, & Intersection Results**

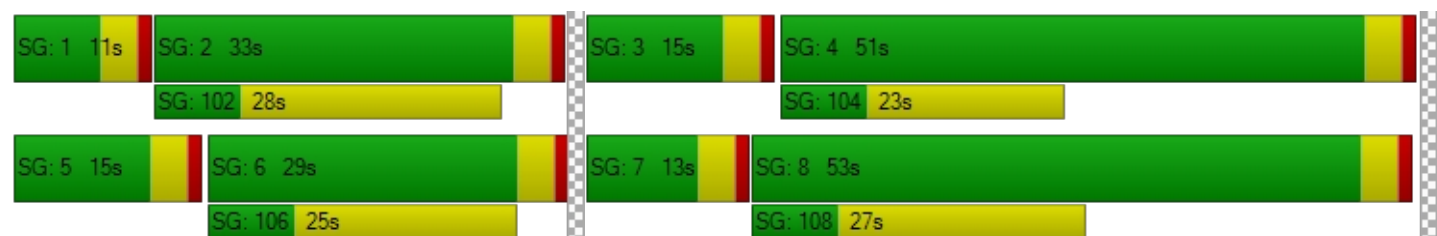
d_M, Delay for Movement [s/veh]	8.10	12.50	12.22	7.84	13.64	13.53	59.89	47.48	46.10	54.37	44.42	37.69
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.54			12.78			49.08			45.74		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	33.05											
Intersection LOS	C											
Intersection V/C	0.421											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.632			2.495			2.682			2.855		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			455			891			855		
d_b, Bicycle Delay [s]	29.82			32.84			16.91			18.04		
I_b,int, Bicycle LOS Score for Intersection	1.960			1.981			2.181			2.126		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.271

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	20	19	127	15	17	18	630	3	18	730	118
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	20	19	127	15	17	18	630	3	18	730	118
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	5	32	4	4	5	158	1	5	183	30
Total Analysis Volume [veh/h]	5	20	19	127	15	17	18	630	3	18	730	118
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	6	15	87	87	87	81	81	91
g / C, Green / Cycle	0.04	0.04	0.04	0.06	0.14	0.79	0.79	0.79	0.73	0.73	0.83
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.04	0.02	0.01	0.17	0.17	0.01	0.19	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	81	78	73	206	245	1395	1503	1424	1261	2779	1488
d1, Uniform Delay [s]	50.76	51.16	51.16	50.57	41.81	2.42	2.89	2.89	4.02	4.92	1.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	1.73	1.83	2.97	0.24	0.00	0.33	0.35	0.02	0.23	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.26	0.26	0.62	0.13	0.01	0.22	0.22	0.01	0.26	0.08
d, Delay for Lane Group [s/veh]	51.08	52.89	53.00	53.53	42.05	2.43	3.23	3.24	4.04	5.15	1.79
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.57	0.55	1.79	0.78	0.06	1.51	1.43	0.10	2.49	0.31
50th-Percentile Queue Length [ft/ln]	3.49	14.29	13.63	44.76	19.57	1.62	37.64	35.77	2.59	62.19	7.82
95th-Percentile Queue Length [veh/ln]	0.25	1.03	0.98	3.22	1.41	0.12	2.71	2.58	0.19	4.48	0.56
95th-Percentile Queue Length [ft/ln]	6.28	25.73	24.53	80.58	35.23	2.91	67.75	64.39	4.67	111.95	14.07



**Movement, Approach, & Intersection Results**

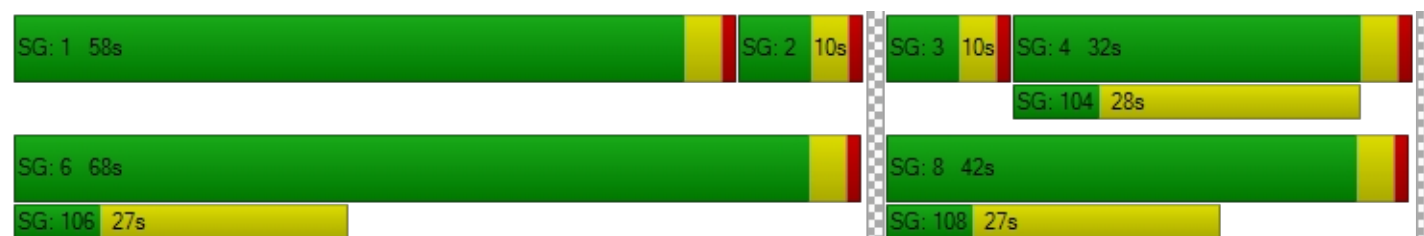
d_M, Delay for Movement [s/veh]	51.08	52.89	53.00	53.53	42.05	42.05	2.43	3.23	3.24	4.04	5.15	1.79
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.73			51.22			3.21			4.67		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.65											
Intersection LOS	A											
Intersection V/C	0.271											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.186			2.237			2.590			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.632			1.822			2.097			2.274		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.381

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	69	110	122	78	126	61	54	627	68	89	704	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	69	110	122	78	126	61	54	627	68	89	704	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	28	31	20	32	15	14	157	17	22	176	15
Total Analysis Volume [veh/h]	69	110	122	78	126	61	54	627	68	89	704	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	36	0	14	38	0	10	46	0	14	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	20	10	10	20	10	10	82	73	73	82	74	74
g / C, Green / Cycle	0.18	0.09	0.09	0.18	0.09	0.09	0.75	0.66	0.66	0.75	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.07	0.04	0.05	0.05	0.03	0.19	0.18	0.05	0.21	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	335	173	164	325	178	169	1270	1255	1189	1285	1268	1201
d1, Uniform Delay [s]	38.59	48.25	48.77	38.79	47.68	47.54	3.59	7.85	7.79	3.67	7.72	7.66
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	3.80	6.47	0.38	2.67	2.50	0.01	0.58	0.59	0.10	0.65	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.21	0.63	0.74	0.24	0.55	0.52	0.04	0.29	0.28	0.07	0.31	0.31
d, Delay for Lane Group [s/veh]	38.89	52.06	55.24	39.17	50.35	50.04	3.61	8.43	8.37	3.77	8.36	8.32
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.62	3.09	3.55	1.85	2.71	2.42	0.27	3.55	3.24	0.49	3.89	3.56
50th-Percentile Queue Length [ft/ln]	40.58	77.28	88.86	46.18	67.87	60.61	6.78	88.77	80.91	12.14	97.16	89.06
95th-Percentile Queue Length [veh/ln]	2.92	5.56	6.40	3.32	4.89	4.36	0.49	6.39	5.83	0.87	7.00	6.41
95th-Percentile Queue Length [ft/ln]	73.05	139.10	159.96	83.12	122.16	109.10	12.21	159.78	145.64	21.85	174.89	160.30

**Movement, Approach, & Intersection Results**

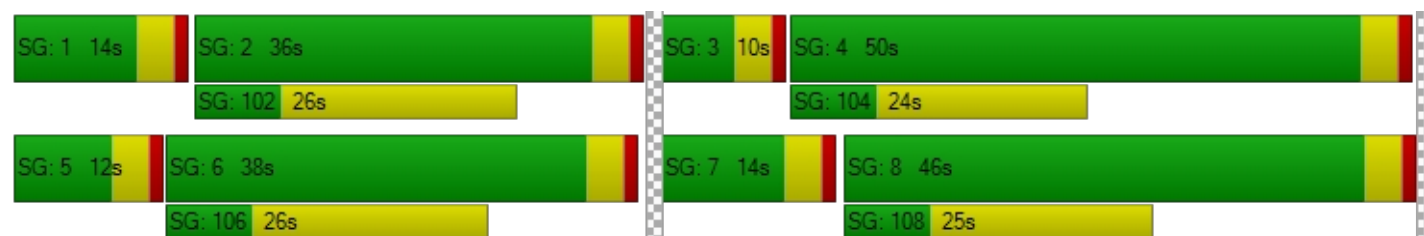
d_M, Delay for Movement [s/veh]	38.89	52.06	55.24	39.17	50.28	50.04	3.61	8.40	8.37	3.77	8.34	8.32
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	50.33			46.96			8.06			7.86		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	18.60											
Intersection LOS	B											
Intersection V/C	0.381											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.509			2.313			2.629			2.649		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			618			764			836		
d_b, Bicycle Delay [s]	27.65			26.25			21.02			18.62		
I_b,int, Bicycle LOS Score for Intersection	2.056			1.778			2.178			2.264		
Bicycle LOS	B			A			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.316

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	32	33	71	57	49	32	21	695	29	45	829	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	33	71	57	49	32	21	695	29	45	829	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	8	18	14	12	8	5	174	7	11	207	9
Total Analysis Volume [veh/h]	32	33	71	57	49	32	21	695	29	45	829	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	50	0	0	50	0	29	31	0	29	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	86	86	86	88	88	88
g / C, Green / Cycle	0.06	0.06	0.06	0.06	0.06	0.79	0.79	0.79	0.80	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.04	0.03	0.05	0.01	0.20	0.19	0.03	0.24	0.23
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	75	122	116	123	116	1276	1492	1413	1418	1520	1440
d1, Uniform Delay [s]	49.02	49.00	50.13	49.73	50.42	2.57	3.16	3.15	2.26	2.88	2.87
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.87	1.18	5.21	2.69	7.48	0.01	0.40	0.42	0.04	0.49	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.27	0.61	0.46	0.70	0.02	0.25	0.25	0.03	0.29	0.29
d, Delay for Lane Group [s/veh]	52.89	50.18	55.34	52.42	57.91	2.58	3.57	3.57	2.30	3.37	3.38
Lane Group LOS	D	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.92	0.90	2.07	1.61	2.42	0.08	1.87	1.75	0.16	2.09	1.95
50th-Percentile Queue Length [ft/ln]	22.95	22.59	51.70	40.14	60.53	1.99	46.83	43.83	4.11	52.20	48.72
95th-Percentile Queue Length [veh/ln]	1.65	1.63	3.72	2.89	4.36	0.14	3.37	3.16	0.30	3.76	3.51
95th-Percentile Queue Length [ft/ln]	41.30	40.66	93.06	72.26	108.95	3.58	84.30	78.89	7.39	93.96	87.70



**Movement, Approach, & Intersection Results**

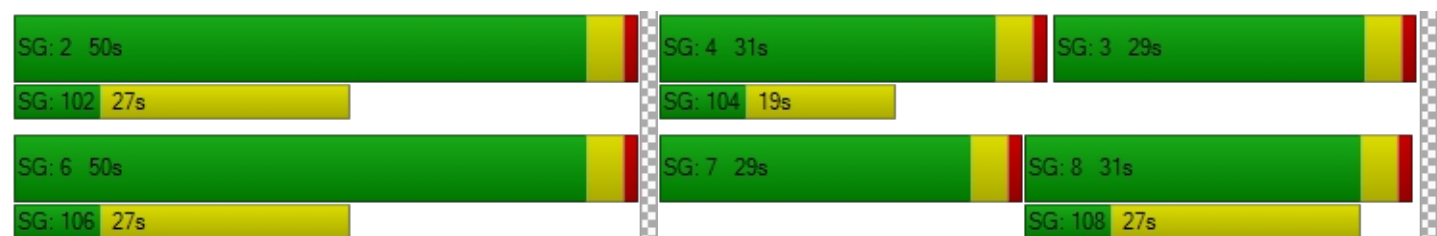
d_M, Delay for Movement [s/veh]	52.89	50.18	55.34	52.42	57.91	57.91	2.58	3.57	3.57	2.30	3.38	3.38
Movement LOS	D	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.51			55.64			3.54			3.32		
Approach LOS	D			E			A			A		
d_I, Intersection Delay [s/veh]	10.68											
Intersection LOS	B											
Intersection V/C	0.316											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.251			2.052			2.674			2.729		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			491			491		
d_b, Bicycle Delay [s]	18.62			18.62			31.31			31.31		
I_b,int, Bicycle LOS Score for Intersection	1.784			1.787			2.174			2.311		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	117	333	106	173	304	252	233	604	61	126	568	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	333	106	173	304	252	233	604	61	126	568	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	83	27	43	76	63	58	151	15	32	142	35
Total Analysis Volume [veh/h]	117	333	106	173	304	252	233	604	61	126	568	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	34	0	16	37	37	23	47	0	13	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	57	57	8	55	70	10	21	21	9	20	20
g / C, Green / Cycle	0.08	0.52	0.52	0.07	0.50	0.63	0.09	0.19	0.19	0.08	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.06	0.05	0.08	0.14	0.07	0.16	0.03	0.07	0.15	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	145	1954	925	240	1908	1137	327	720	341	148	679	322
d1, Uniform Delay [s]	49.77	14.24	13.81	50.24	14.83	8.68	48.49	43.01	37.44	49.83	43.67	40.22
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.00	0.19	0.25	4.03	0.18	0.10	2.90	2.72	0.25	12.42	2.83	0.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.17	0.11	0.72	0.16	0.22	0.71	0.84	0.18	0.85	0.84	0.43
d, Delay for Lane Group [s/veh]	59.76	14.43	14.06	54.27	15.01	8.78	51.39	45.72	37.69	62.25	46.50	41.13
Lane Group LOS	E	B	B	D	B	A	D	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.56	2.23	1.41	2.46	2.08	2.48	3.23	8.14	1.41	3.92	7.69	3.40
50th-Percentile Queue Length [ft/ln]	89.01	55.74	35.23	61.60	52.00	61.97	80.82	203.44	35.17	98.07	192.26	85.10
95th-Percentile Queue Length [veh/ln]	6.41	4.01	2.54	4.44	3.74	4.46	5.82	12.82	2.53	7.06	12.24	6.13
95th-Percentile Queue Length [ft/ln]	160.22	100.34	63.41	110.88	93.61	111.55	145.48	320.40	63.30	176.53	305.96	153.17

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.76	14.43	14.06	54.27	15.01	8.78	51.39	45.72	37.69	62.25	46.50	41.13
Movement LOS	E	B	B	D	B	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.90			22.17			46.65			47.99		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.91											
Intersection LOS	D											
Intersection V/C	0.490											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.633			2.803			2.859			2.741		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			600		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.018			2.161			2.300			2.246		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	26	0	31	0	169	112	96	221	0
Total Analysis Volume [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	26	0	0	19	0	65	84	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	62	62	26	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.18	0.25	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		159	159	2157	1022	423	3188
d1, Uniform Delay [s]		48.47	49.02	12.50	13.67	40.94	1.86
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.36	7.49	0.38	1.36	7.82	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.65	0.77	0.31	0.44	0.91	0.28
d, Delay for Lane Group [s/veh]		52.83	56.51	12.88	15.03	48.77	2.08
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.92	3.60	4.34	6.51	10.95	1.27
50th-Percentile Queue Length [ft/ln]		73.02	89.97	108.62	162.73	273.83	31.64
95th-Percentile Queue Length [veh/ln]		5.26	6.48	7.76	10.69	16.38	2.28
95th-Percentile Queue Length [ft/ln]		131.44	161.95	194.08	267.33	409.53	56.95



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.83	52.83	56.51	0.00	12.88	15.03	48.77	2.08	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			54.83			13.74			16.26		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.50											
Intersection LOS	B											
Intersection V/C	0.594											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.243	1.834	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	400	273	1455
d_b, Bicycle Delay [s]	55.00	35.20	41.02	4.09
I_b,int, Bicycle LOS Score for Intersection	4.132	1.931	2.176	2.605
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	117	0	108	0	0	0	51	154	0	0	206	38
Total Analysis Volume [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	67	0	0	0	0	0	15	43	0	0	28	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		15	80	61	61
g / C, Green / Cycle	0.20	0.20	0.20		0.13	0.72	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.16		0.11	0.16	0.26	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	365	365	365		241	2753	1053	998
d1, Uniform Delay [s]	42.06	41.92	41.77		46.57	4.98	14.68	14.96
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.01	4.61	4.21		8.26	0.19	1.46	1.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.81		0.85	0.22	0.46	0.49
d, Delay for Lane Group [s/veh]	47.07	46.54	45.97		54.83	5.17	16.13	16.67
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.37	8.18	7.97		6.01	2.11	7.44	7.63
50th-Percentile Queue Length [ft/ln]	209.36	204.60	199.26		150.21	52.78	186.10	190.66
95th-Percentile Queue Length [veh/ln]	13.12	12.88	12.60		10.03	3.80	11.92	12.16
95th-Percentile Queue Length [ft/ln]	328.00	321.89	315.01		250.71	95.00	297.96	303.88

**Movement, Approach, & Intersection Results**

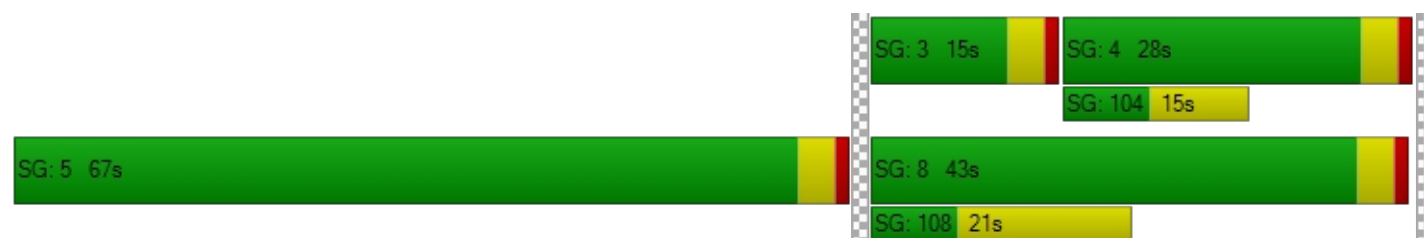
d_M, Delay for Movement [s/veh]	46.88	0.00	46.15	0.00	0.00	0.00	54.83	5.17	0.00	0.00	16.35	16.67
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	46.53			0.00			17.56			16.40		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.80											
Intersection LOS	C											
Intersection V/C	0.621											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.242	1.779	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	709	436
d_b, Bicycle Delay [s]	55.00	55.00	22.91	33.62
I_b,int, Bicycle LOS Score for Intersection	5.614	4.132	2.238	2.362
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	4.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.227

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	26	483	17	14	651	11	12	13	31	11	14	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	483	17	14	651	11	12	13	31	11	14	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	121	4	4	163	3	3	3	8	3	4	3
Total Analysis Volume [veh/h]	26	483	17	14	651	11	12	13	31	11	14	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.14	0.13	0.01	0.18	0.18	0.03	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1565	1676	1588	1578	1676	1588	121	124
d1, Uniform Delay [s]	0.77	0.88	0.88	0.77	0.93	0.93	51.73	51.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.20	0.20	0.01	0.27	0.29	2.75	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.15	0.15	0.01	0.20	0.20	0.46	0.30
d, Delay for Lane Group [s/veh]	0.79	1.08	1.09	0.78	1.20	1.22	54.47	52.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.30	0.29	0.01	0.42	0.40	1.61	1.04
50th-Percentile Queue Length [ft/ln]	0.68	7.56	7.20	0.36	10.55	10.09	40.29	25.98
95th-Percentile Queue Length [veh/ln]	0.05	0.54	0.52	0.03	0.76	0.73	2.90	1.87
95th-Percentile Queue Length [ft/ln]	1.22	13.61	12.96	0.65	18.98	18.16	72.52	46.76



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.79	1.08	1.09	0.78	1.21	1.22	54.47	54.47	54.47	52.51	52.51	52.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.07			1.20			54.47			52.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.92											
Intersection LOS	A											
Intersection V/C	0.227											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.563			2.557			1.814			1.784		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.994			2.117			1.652			1.621		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	89	953	75	82	932	173	189	391	81	115	375	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	953	75	82	932	173	189	391	81	115	375	159
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	238	19	21	233	43	47	98	20	29	94	40
Total Analysis Volume [veh/h]	89	953	75	82	932	173	189	391	81	115	375	159
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	10	55	0	17	33	0	12	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	47	37	37	47	37	37	55	45	45	55	42	42
g / C, Green / Cycle	0.43	0.34	0.34	0.43	0.34	0.34	0.50	0.41	0.41	0.50	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.05	0.25	0.04	0.05	0.31	0.29	0.11	0.10	0.05	0.06	0.10	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	336	1290	611	461	643	609	874	1560	739	874	1457	690
d1, Uniform Delay [s]	19.03	32.06	25.07	18.96	34.73	33.94	15.34	21.32	20.03	14.67	23.22	22.96
k, delay calibration	0.11	0.11	0.11	0.11	0.21	0.19	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	0.85	0.09	0.18	9.36	6.08	0.12	0.39	0.30	0.31	0.43	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.74	0.12	0.18	0.91	0.86	0.22	0.25	0.11	0.13	0.26	0.23
d, Delay for Lane Group [s/veh]	19.45	32.91	25.16	19.14	44.09	40.02	15.46	21.71	20.33	14.98	23.65	23.74
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	11.16	1.37	1.28	16.23	13.80	2.64	3.38	1.34	1.59	3.40	2.93
50th-Percentile Queue Length [ft/ln]	35.28	279.08	34.25	32.07	405.81	345.00	66.03	84.40	33.57	39.87	85.05	73.22
95th-Percentile Queue Length [veh/ln]	2.54	16.64	2.47	2.31	22.84	19.89	4.75	6.08	2.42	2.87	6.12	5.27
95th-Percentile Queue Length [ft/ln]	63.51	416.06	61.65	57.72	571.00	497.31	118.86	151.92	60.43	71.77	153.08	131.80

**Movement, Approach, & Intersection Results**

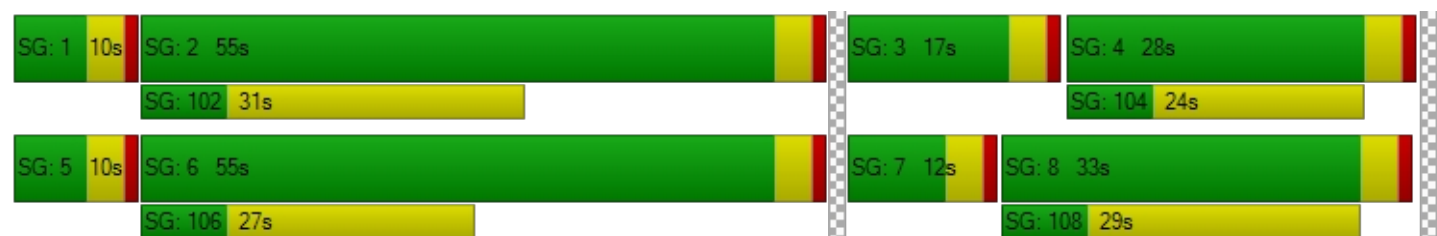
d_M, Delay for Movement [s/veh]	19.45	32.91	25.16	19.14	42.56	40.02	15.46	21.71	20.33	14.98	23.65	23.74
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	31.32			40.57			19.75			22.14		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	30.59											
Intersection LOS	C											
Intersection V/C	0.585											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.898			2.903			2.718			2.699		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			927			527			436		
d_b, Bicycle Delay [s]	15.82			15.82			29.82			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.481			2.539			2.105			2.095		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.440

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	118	450	203	31	557	55	41	440	97	221	456	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	450	203	31	557	55	41	440	97	221	456	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	113	51	8	139	14	10	110	24	55	114	7
Total Analysis Volume [veh/h]	118	450	203	31	557	55	41	440	97	221	456	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	58	0	12	43	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	21	21	21	4	57	57	9	62	62
g / C, Green / Cycle	0.21	0.21	0.21	0.19	0.19	0.19	0.04	0.52	0.52	0.09	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.07	0.12	0.11	0.02	0.17	0.16	0.02	0.12	0.05	0.06	0.12	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	228	813	385	255	369	350	72	1978	937	301	2152	1020
d1, Uniform Delay [s]	36.41	38.59	38.35	36.36	42.93	42.69	51.92	14.31	13.38	49.10	11.76	10.51
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.82	0.59	1.12	0.21	6.04	5.37	6.92	0.26	0.22	3.49	0.22	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.55	0.53	0.12	0.86	0.84	0.57	0.22	0.10	0.74	0.21	0.03
d, Delay for Lane Group [s/veh]	38.23	39.18	39.47	36.57	48.97	48.05	58.84	14.57	13.60	52.59	11.98	10.55
Lane Group LOS	D	D	D	D	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.79	5.47	4.96	0.70	8.95	8.14	1.25	2.99	1.26	3.10	2.74	0.30
50th-Percentile Queue Length [ft/ln]	69.66	136.64	124.00	17.53	223.71	203.60	31.23	74.84	31.54	77.57	68.62	7.42
95th-Percentile Queue Length [veh/ln]	5.02	9.30	8.61	1.26	13.85	12.82	2.25	5.39	2.27	5.58	4.94	0.53
95th-Percentile Queue Length [ft/ln]	125.38	232.50	215.31	31.55	346.35	320.61	56.21	134.71	56.78	139.62	123.52	13.36



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	38.23	39.18	39.47	36.57	48.58	48.05	58.84	14.57	13.60	52.59	11.98	10.55
Movement LOS	D	D	D	D	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	39.11			47.95			17.55			24.68		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	32.83											
Intersection LOS	C											
Intersection V/C	0.440											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.730			2.536			2.752			2.802		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			709			473			473		
d_b, Bicycle Delay [s]	14.25			22.91			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.196			2.090			2.036			2.140		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.512

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	66	1203	36	17	1250	26	44	98	90	75	91	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	1203	36	17	1250	26	44	98	90	75	91	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	301	9	4	313	7	11	25	23	19	23	6
Total Analysis Volume [veh/h]	66	1203	36	17	1250	26	44	98	90	75	91	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	63	0	0	63	0	0	47	0	0	47	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.33	0.01	0.35	0.34	0.13	0.04	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1207	1481	1403	1216	1481	1403	305	79	265
d1, Uniform Delay [s]	2.77	4.01	4.00	2.69	4.07	4.06	45.75	41.59	42.57
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.92	0.95	0.02	0.97	1.01	3.94	36.60	1.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.43	0.43	0.01	0.44	0.44	0.76	0.95	0.43
d, Delay for Lane Group [s/veh]	2.85	4.93	4.95	2.71	5.04	5.07	49.69	78.19	43.69
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.29	4.09	3.84	0.07	4.27	4.02	6.49	2.61	2.92
50th-Percentile Queue Length [ft/ln]	7.32	102.19	95.94	1.83	106.72	100.59	162.22	65.23	73.04
95th-Percentile Queue Length [veh/ln]	0.53	7.36	6.91	0.13	7.66	7.24	10.67	4.70	5.26
95th-Percentile Queue Length [ft/ln]	13.18	183.95	172.69	3.29	191.43	181.06	266.66	117.41	131.47

**Movement, Approach, & Intersection Results**

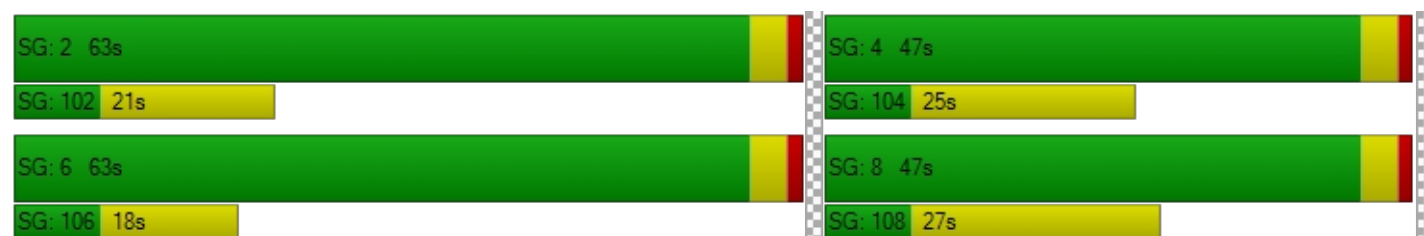
d_M, Delay for Movement [s/veh]	2.85	4.94	4.95	2.71	5.05	5.07	49.69	49.69	49.69	78.19	43.69	43.69
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	4.84			5.02			49.69			57.31		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.66											
Intersection LOS	B											
Intersection V/C	0.512											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.946			2.872			2.021			2.085		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1073			1073			782			782		
d_b, Bicycle Delay [s]	11.82			11.82			20.40			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.636			2.626			1.942			1.873		
Bicycle LOS	B			B			A			A		

**Sequence**


Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	105	800	65	60	778	54	42	44	98	106	39	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	800	65	60	778	54	42	44	98	106	39	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	200	16	15	195	14	11	11	25	27	10	12
Total Analysis Volume [veh/h]	105	800	65	60	778	54	42	44	98	106	39	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.24	0.23	0.03	0.23	0.22	0.10	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1360	1524	1444	1354	1524	1444	265	276
d1, Uniform Delay [s]	2.28	2.82	2.79	2.22	2.78	2.76	46.84	47.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.49	0.50	0.06	0.47	0.48	3.25	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.30	0.29	0.04	0.28	0.28	0.69	0.70
d, Delay for Lane Group [s/veh]	2.39	3.31	3.29	2.28	3.25	3.24	50.09	50.23
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.39	2.07	1.91	0.22	1.97	1.82	5.12	5.36
50th-Percentile Queue Length [ft/ln]	9.86	51.83	47.64	5.48	49.13	45.40	128.06	134.07
95th-Percentile Queue Length [veh/ln]	0.71	3.73	3.43	0.39	3.54	3.27	8.83	9.16
95th-Percentile Queue Length [ft/ln]	17.74	93.29	85.74	9.87	88.43	81.72	220.85	229.02



**Movement, Approach, & Intersection Results**

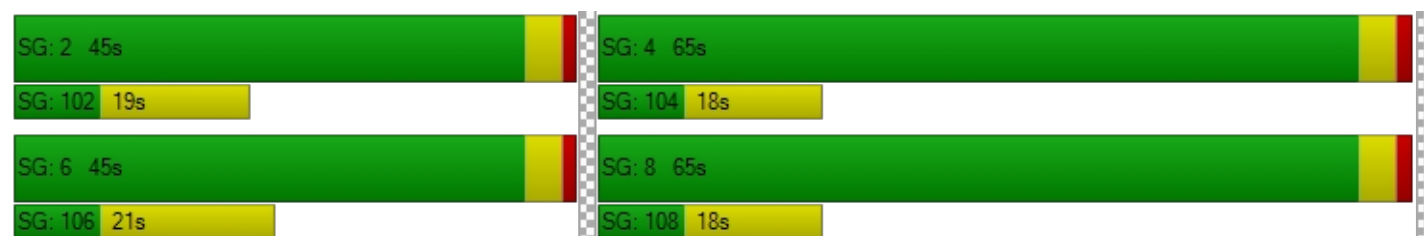
d_M, Delay for Movement [s/veh]	2.39	3.30	3.29	2.28	3.24	3.24	50.09	50.09	50.09	50.23	50.23	50.23
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.20			3.18			50.09			50.23		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.08											
Intersection LOS	B											
Intersection V/C	0.371											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.841			2.716			2.060			1.986		
Crosswalk LOS	C			B			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.360			2.296			1.863			1.876		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	233	1174	200	206	1161	165	241	702	262	227	834	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	233	1174	200	206	1161	165	241	702	262	227	834	201
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	294	50	52	290	41	60	176	66	57	209	50
Total Analysis Volume [veh/h]	233	1174	200	206	1161	165	241	702	262	227	834	201
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	11	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	36	36	7	35	35	17	35	35	16	34	34
g / C, Green / Cycle	0.07	0.33	0.33	0.06	0.32	0.32	0.15	0.32	0.32	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.07	0.31	0.11	0.06	0.29	0.13	0.13	0.12	0.15	0.13	0.15	0.11
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1258	596	223	1224	580	271	1809	571	256	1762	557
d1, Uniform Delay [s]	50.66	35.62	27.69	51.23	35.39	29.19	45.84	29.23	30.00	46.32	30.75	29.55
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.21	3.82	0.33	14.57	2.38	0.48	9.71	0.63	2.64	9.95	0.91	1.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.91	0.93	0.34	0.92	0.89	0.42	0.89	0.39	0.46	0.89	0.47	0.36
d, Delay for Lane Group [s/veh]	62.86	39.44	28.02	65.80	37.77	29.67	55.55	29.86	32.64	56.27	31.67	31.37
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.61	15.57	4.00	3.27	13.94	5.03	7.15	4.90	5.93	6.77	6.09	4.41
50th-Percentile Queue Length [ft/ln]	90.22	389.20	100.03	81.69	348.38	125.82	178.83	122.55	148.26	169.28	152.17	110.16
95th-Percentile Queue Length [veh/ln]	6.50	22.04	7.20	5.88	20.06	8.71	11.54	8.53	9.92	11.04	10.13	7.85
95th-Percentile Queue Length [ft/ln]	162.40	550.97	180.06	147.04	501.44	217.79	288.49	213.33	248.10	275.96	253.32	196.23

**Movement, Approach, & Intersection Results**

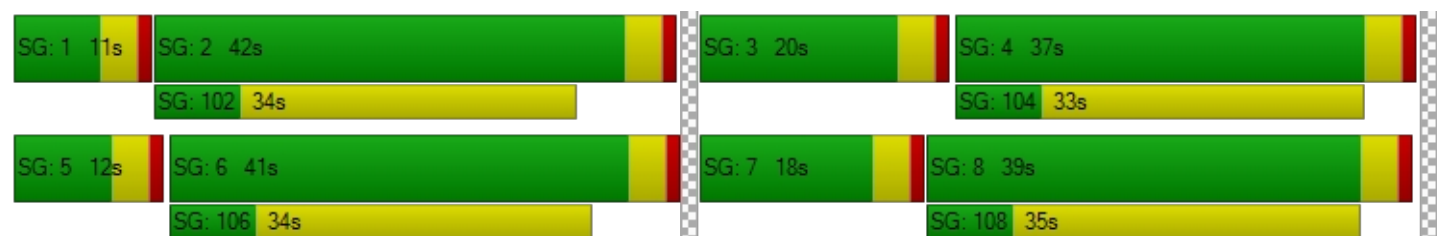
d_M, Delay for Movement [s/veh]	62.86	39.44	28.02	65.80	37.24	29.67	55.55	29.86	32.64	56.27	31.67	31.37
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	41.41			40.26			35.60			36.05		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.64											
Intersection LOS	D											
Intersection V/C	0.758											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.132			3.042			3.032			3.024		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			673			636			600		
d_b, Bicycle Delay [s]	23.56			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.885			2.402			2.222			2.254		
Bicycle LOS	C			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	301	815	91	171	777	150	170	596	231	122	502	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	301	815	91	171	777	150	170	596	231	122	502	119
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	204	23	43	194	38	43	149	58	31	126	30
Total Analysis Volume [veh/h]	301	815	91	171	777	150	170	596	231	122	502	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	45	0	21	37	0	10	33	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	33	33	46	26	26	12	46	46	6	40	40
g / C, Green / Cycle	0.42	0.30	0.30	0.42	0.24	0.24	0.11	0.42	0.42	0.05	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.17	0.21	0.05	0.10	0.20	0.08	0.09	0.16	0.13	0.03	0.17	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	498	1136	538	503	913	432	203	1596	756	189	686	650
d1, Uniform Delay [s]	22.47	34.44	28.49	20.68	39.95	34.67	47.85	21.97	21.25	51.03	27.17	26.82
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.18	0.86	0.15	0.40	2.35	0.48	8.78	0.67	1.04	3.63	2.39	2.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.72	0.17	0.34	0.85	0.35	0.84	0.37	0.31	0.64	0.48	0.45
d, Delay for Lane Group [s/veh]	23.65	35.30	28.64	21.07	42.30	35.15	56.62	22.64	22.30	54.66	29.57	29.05
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.57	9.76	1.80	2.88	10.24	3.39	5.05	5.39	4.15	1.74	7.07	6.20
50th-Percentile Queue Length [ft/ln]	139.18	243.94	44.99	72.01	255.91	84.68	126.16	134.73	103.72	43.54	176.85	154.94
95th-Percentile Queue Length [veh/ln]	9.44	14.88	3.24	5.18	15.48	6.10	8.73	9.20	7.47	3.13	11.44	10.28
95th-Percentile Queue Length [ft/ln]	235.92	372.01	80.98	129.61	387.09	152.43	218.26	229.91	186.69	78.37	285.89	257.01



**Movement, Approach, & Intersection Results**

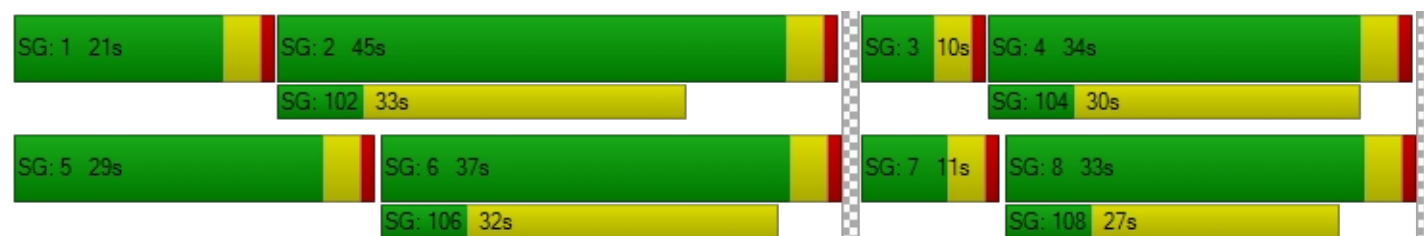
d_M, Delay for Movement [s/veh]	23.65	35.30	28.64	21.07	42.30	35.15	56.62	22.64	22.30	54.66	29.39	29.05
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	31.89			38.02			28.36			33.48		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	32.98											
Intersection LOS	C											
Intersection V/C	0.698											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.842			2.820			2.890			2.904		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			600			527			545		
d_b, Bicycle Delay [s]	21.64			26.95			29.82			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.555			2.465			2.108			2.173		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	20.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.775

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	408	0	0	362	161	0	0	0	55	91	118
Total Analysis Volume [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	62	52	52		30	30	30
g / C, Green / Cycle	0.06	0.62	0.52	0.52		0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.37	0.39		0.12	0.10	0.26
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3541	1987	941		538	1136	538
d1, Uniform Delay [s]	45.81	10.06	17.97	18.57		27.99	27.19	33.35
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.43	2.09	5.22		0.50	0.16	4.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.46	0.70	0.74		0.41	0.32	0.88
d, Delay for Lane Group [s/veh]	48.11	10.49	20.07	23.79		28.48	27.36	38.18
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	5.97	11.97	13.13		4.21	3.38	11.37
50th-Percentile Queue Length [ft/ln]	35.31	149.14	299.25	328.36		105.28	84.39	284.22
95th-Percentile Queue Length [veh/ln]	2.54	9.97	17.64	19.08		7.58	6.08	16.90
95th-Percentile Queue Length [ft/ln]	63.56	249.28	441.10	476.95		189.42	151.90	422.46

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.11	10.49	0.00	0.00	20.21	23.79	0.00	0.00	0.00	28.48	27.36	38.18
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	12.91			21.31			0.00			32.43		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	20.72											
Intersection LOS	C											
Intersection V/C	0.775											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.265	2.394
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	560	360	0	1280
d_b, Bicycle Delay [s]	25.92	33.62	50.00	6.48
I_b,int, Bicycle LOS Score for Intersection	2.519	2.709	4.132	2.432
Bicycle LOS	B	B	D	B

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	175	0	0	265	72	0	0	0	43	135	171
Total Analysis Volume [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.24	0.25		0.20	0.19	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2856	1522	721		754	796	754
d1, Uniform Delay [s]	46.31	14.20	23.52	23.93		21.09	20.71	27.22
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.03	0.20	1.68	4.02		0.47	0.39	6.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.59	0.62		0.48	0.44	0.91
d, Delay for Lane Group [s/veh]	57.34	14.40	25.20	27.94		21.55	21.10	34.17
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.38	2.97	8.44	9.03		6.05	5.81	16.08
50th-Percentile Queue Length [ft/ln]	59.49	74.36	210.89	225.63		151.17	145.16	401.95
95th-Percentile Queue Length [veh/ln]	4.28	5.35	13.20	13.95		10.08	9.76	22.65
95th-Percentile Queue Length [ft/ln]	107.08	133.85	329.97	348.80		251.99	243.96	566.35



**Movement, Approach, & Intersection Results**

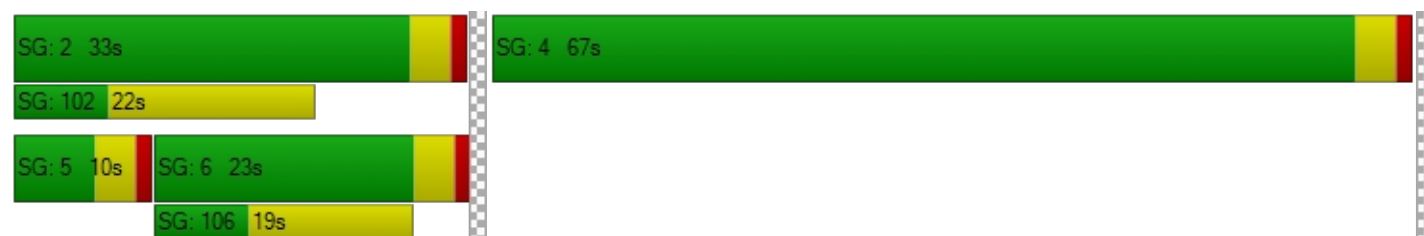
d_M, Delay for Movement [s/veh]	57.34	14.40	0.00	0.00	25.62	27.94	0.00	0.00	0.00	21.55	21.26	34.17
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	19.00			26.11			0.00			27.63		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	25.13											
Intersection LOS	C											
Intersection V/C	0.768											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.164	2.398
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	1.991	2.300	4.132	2.710
Bicycle LOS	A	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	258	66	123	288	0	173	58	37	0	0	0
Total Analysis Volume [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	17	68	24	24	24	
g / C, Green / Cycle	0.48	0.48	0.17	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.20	0.12	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2715	857	588	3900	825	448	424	
d1, Uniform Delay [s]	16.75	16.05	40.26	6.25	36.37	33.24	31.80	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.41	0.92	3.21	0.19	2.33	0.92	0.48	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.38	0.31	0.84	0.30	0.84	0.52	0.35	
d, Delay for Lane Group [s/veh]	17.16	16.98	43.48	6.44	38.70	34.16	32.28	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.01	3.80	6.04	2.90	8.15	4.94	2.99	
50th-Percentile Queue Length [ft/ln]	125.17	94.88	150.99	72.58	203.76	123.47	74.84	
95th-Percentile Queue Length [veh/ln]	8.68	6.83	10.07	5.23	12.83	8.58	5.39	
95th-Percentile Queue Length [ft/ln]	216.91	170.79	251.75	130.64	320.81	214.59	134.72	

**Movement, Approach, & Intersection Results**

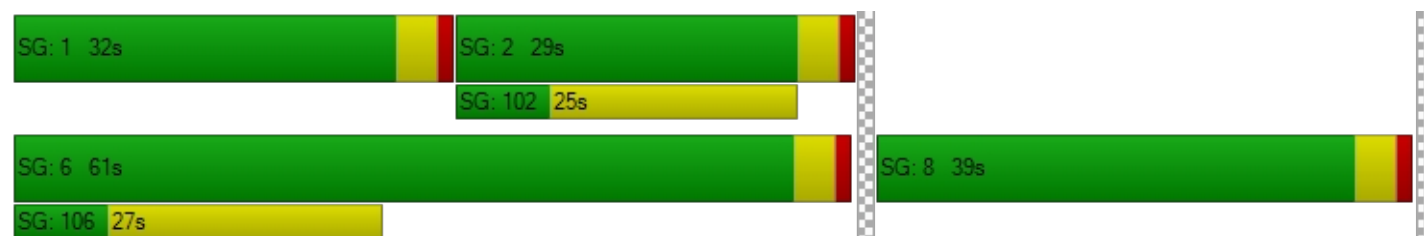
d_M, Delay for Movement [s/veh]	0.00	17.16	16.98	43.48	6.44	0.00	38.70	34.16	32.28	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	17.12			17.51			36.84			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.54											
Intersection LOS	C											
Intersection V/C	0.589											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.396			2.199		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.272			2.463			3.322			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	145	45	142	179	0	50	187	15	0	0	0
Total Analysis Volume [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	40	40	18	62	30	30	30	
g / C, Green / Cycle	0.40	0.40	0.18	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.16	0.19	0.27	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1510	715	641	2357	539	569	539	
d1, Uniform Delay [s]	20.94	21.12	39.84	8.88	33.44	32.60	25.34	
k, delay calibration	0.50	0.50	0.11	0.50	0.13	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.60	1.37	4.37	0.33	6.01	3.12	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.33	0.35	0.89	0.30	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	21.54	22.49	44.21	9.22	39.45	35.72	25.43	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.16	4.34	7.11	3.49	11.74	10.85	1.01	
50th-Percentile Queue Length [ft/ln]	103.92	108.43	177.63	87.36	293.42	271.33	25.15	
95th-Percentile Queue Length [veh/ln]	7.48	7.75	11.48	6.29	17.36	16.26	1.81	
95th-Percentile Queue Length [ft/ln]	187.05	193.82	286.92	157.25	433.88	406.40	45.28	



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	21.66	22.49	44.21	9.22	0.00	39.45	37.11	25.43	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	21.86			24.68			36.90			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.02											
Intersection LOS	C											
Intersection V/C	0.647											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.273			2.449		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.976			2.620			2.391			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	20	258	16	6	291
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	20	258	16	6	291
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	65	4	2	73
Total Analysis Volume [veh/h]	0	20	258	16	6	291
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	9.73	0.00	0.00	7.81	0.00
Movement LOS		A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.08	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.97	0.00	0.00	0.35	0.00
d_A, Approach Delay [s/veh]	9.73		0.00		0.16	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.41					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	5.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.156

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	393	29	5	329	0	2	2	7	38	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	393	29	5	329	0	2	2	7	38	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	98	7	1	82	0	1	1	2	10	0	3
Total Analysis Volume [veh/h]	0	393	29	5	329	0	2	2	7	38	0	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	73	0	10	83	0	0	27	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	92	92	97	97	5	5	5	5
g / C, Green / Cycle	0.84	0.84	0.88	0.88	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.11	0.12	0.00	0.09	0.00	0.01	0.02	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1596	1512	1643	3361	113	110	104	77
d1, Uniform Delay [s]	1.59	1.60	0.74	0.80	50.44	50.64	51.47	50.70
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.19	0.00	0.06	0.06	0.32	2.13	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.14	0.00	0.10	0.02	0.08	0.36	0.14
d, Delay for Lane Group [s/veh]	1.76	1.79	0.74	0.86	50.51	50.96	53.61	51.54
Lane Group LOS	A	A	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.55	0.56	0.00	0.14	0.05	0.25	1.09	0.31
50th-Percentile Queue Length [ft/ln]	13.73	13.94	0.09	3.55	1.37	6.20	27.13	7.75
95th-Percentile Queue Length [veh/ln]	0.99	1.00	0.01	0.26	0.10	0.45	1.95	0.56
95th-Percentile Queue Length [ft/ln]	24.72	25.09	0.16	6.39	2.46	11.17	48.84	13.94

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	1.77	1.79	0.74	0.86	0.00	50.51	50.96	50.96	53.61	0.00	51.54
Movement LOS		A	A	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	1.77			0.86			50.88			53.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.15											
Intersection LOS	A											
Intersection V/C	0.156											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.457			1.730			1.983		
Crosswalk LOS	F			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1255			1436			418			0		
d_b, Bicycle Delay [s]	7.64			4.37			34.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.908			1.835			1.578			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	3	180	242	0	47	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	180	242	0	47	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	45	61	0	12	4
Total Analysis Volume [veh/h]	3	180	242	0	47	15
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.02
d_M, Delay for Movement [s/veh]	7.72	0.00	0.00	0.00	10.60	9.98
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.28	0.28
95th-Percentile Queue Length [ft/ln]	0.17	0.00	0.00	0.00	7.01	7.01
d_A, Approach Delay [s/veh]	0.13		0.00		10.45	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.38					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	44	178	221	0	0	75
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	178	221	0	0	75
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	45	55	0	0	19
Total Analysis Volume [veh/h]	44	178	221	0	0	75
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.00	0.09
d_M, Delay for Movement [s/veh]	7.76	0.00	0.00	0.00	10.91	9.84
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.10	0.00	0.00	0.00	0.30	0.30
95th-Percentile Queue Length [ft/ln]	2.53	0.00	0.00	0.00	7.54	7.54
d_A, Approach Delay [s/veh]	1.54		0.00		9.84	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.08					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	205	12	24	276	11	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	205	12	24	276	11	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	3	6	69	3	5
Total Analysis Volume [veh/h]	205	12	24	276	11	21
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.02	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.71	0.00	10.86	9.55
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.05	0.00	0.13	0.13
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.35	0.00	3.33	3.33
d_A, Approach Delay [s/veh]	0.00		0.62		10.00	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.92					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	372	24	0	334	5	0	0	12	0	0	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	372	24	0	334	5	0	0	12	0	0	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	93	6	0	84	1	0	0	3	0	0	5
Total Analysis Volume [veh/h]	6	372	24	0	334	5	0	0	12	0	0	21
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	7.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.32	0.00	0.00	9.56
Movement LOS	A	A	A			A	A			A		A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.08
95th-Percentile Queue Length [ft/ln]	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	1.99
d_A, Approach Delay [s/veh]	0.12			0.00			9.32			9.56		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	0.47											
Intersection LOS	A											

*APPENDIX F-IV*





**YEAR 2020 CUMULATIVE PLUS PROJECT  
WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	58.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	304	1309	215	338	1017	399	286	1275	176	194	1138	335
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	304	1309	215	338	1017	399	286	1275	176	194	1138	335
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	327	54	85	254	100	72	319	44	49	285	84
Total Analysis Volume [veh/h]	304	1309	215	338	1017	399	286	1275	176	194	1138	335
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	42	0	11	38	0	15	46	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	46	46	7	42	42	11	34	34	7	30	30
g / C, Green / Cycle	0.10	0.42	0.42	0.06	0.38	0.38	0.10	0.31	0.31	0.06	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.23	0.12	0.10	0.26	0.25	0.16	0.26	0.27	0.06	0.20	0.19
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	354	2391	755	228	1457	690	182	1159	549	228	1534	484
d1, Uniform Delay [s]	48.75	24.11	21.09	51.51	28.15	27.79	49.53	35.74	36.29	50.98	36.78	36.17
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.24	0.11	0.11	0.12
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.09	0.91	0.95	222.16	2.44	4.55	264.45	1.69	9.51	8.62	0.72	1.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.86	0.55	0.28	1.48	0.67	0.64	1.57	0.84	0.87	0.85	0.74	0.69
d, Delay for Lane Group [s/veh]	54.84	25.01	22.04	273.67	30.59	32.35	313.97	37.43	45.80	59.60	37.51	38.16
Lane Group LOS	D	C	C	F	C	C	F	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.40	8.60	3.82	10.17	10.91	10.25	18.36	12.25	13.47	2.92	9.33	8.28
50th-Percentile Queue Length [ft/ln]	109.95	215.05	95.50	254.34	272.81	256.20	459.11	306.23	336.85	72.88	233.31	207.07
95th-Percentile Queue Length [veh/ln]	7.84	13.41	6.88	17.13	16.33	15.50	29.35	17.99	19.49	5.25	14.34	13.00
95th-Percentile Queue Length [ft/ln]	195.94	335.29	171.90	428.13	408.25	387.46	733.74	449.73	487.35	131.19	358.56	325.07

**Movement, Approach, & Intersection Results**

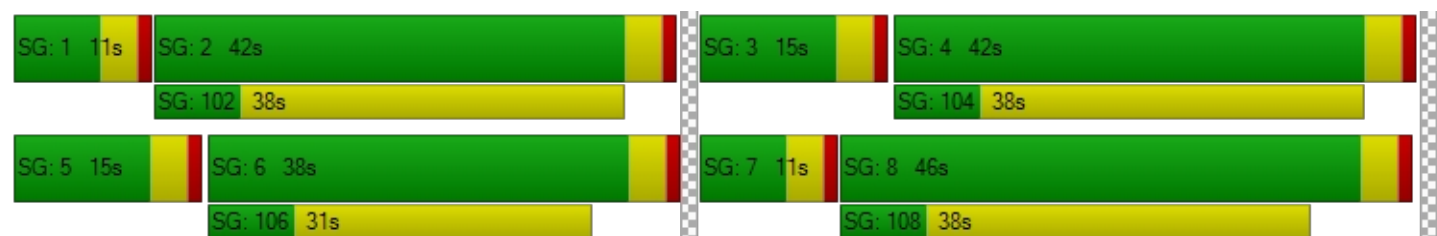
d_M, Delay for Movement [s/veh]	54.84	25.01	22.04	273.67	30.67	32.35	313.97	39.43	45.80	59.60	37.51	38.16
Movement LOS	D	C	C	F	C	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	29.62			77.88			85.28			40.21		
Approach LOS	C			E			F			D		
d_I, Intersection Delay [s/veh]	58.10											
Intersection LOS	E											
Intersection V/C	0.821											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.207			3.184			3.102			3.237		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			764			691		
d_b, Bicycle Delay [s]	23.56			26.25			21.02			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.565			2.524			2.515			2.476		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	27	1449	620	98	1284	69	104	194	37	564	116	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1449	620	98	1284	69	104	194	37	564	116	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	362	155	25	321	17	26	49	9	141	29	0
Total Analysis Volume [veh/h]	27	1449	620	98	1284	69	104	194	37	564	116	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	11	34	0	0	16	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	49	7	53	53	14	14	14	24	24
g / C, Green / Cycle	0.03	0.45	0.06	0.48	0.48	0.12	0.12	0.12	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.05	0.29	0.14	0.06	0.10	0.02	0.19	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	57	2552	116	1826	865	225	237	225	392	392
d1, Uniform Delay [s]	52.40	22.52	50.96	20.86	17.37	44.74	46.95	43.04	41.48	41.61
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.98	0.92	15.09	1.46	0.89	1.48	6.77	0.34	5.68	6.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.57	0.85	0.60	0.30	0.46	0.82	0.16	0.86	0.87
d, Delay for Lane Group [s/veh]	58.38	23.44	66.05	22.32	18.26	46.22	53.72	43.38	47.16	47.81
Lane Group LOS	E	C	E	C	B	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.83	9.27	3.15	10.32	4.15	2.73	5.60	0.92	9.36	9.57
50th-Percentile Queue Length [ft/ln]	20.69	231.66	78.81	258.02	103.78	68.19	140.12	23.08	234.08	239.25
95th-Percentile Queue Length [veh/ln]	1.49	14.26	5.67	15.59	7.47	4.91	9.49	1.66	14.38	14.64
95th-Percentile Queue Length [ft/ln]	37.24	356.46	141.86	389.74	186.80	122.75	237.19	41.54	359.54	366.08

**Movement, Approach, & Intersection Results**

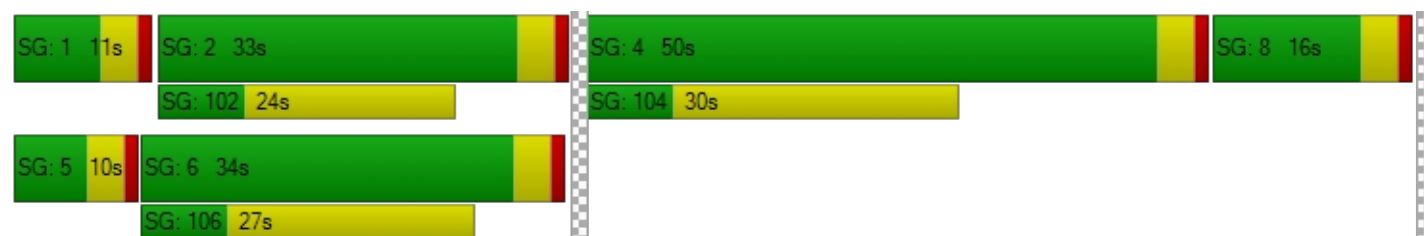
d_M, Delay for Movement [s/veh]	58.38	23.44	0.00	66.05	21.72	18.26	46.22	53.72	43.38	47.42	47.81	0.00
Movement LOS	E	C		E	C	B	D	D	D	D	D	
d_A, Approach Delay [s/veh]	24.08			24.55			50.25			47.49		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.51											
Intersection LOS	C											
Intersection V/C	0.703											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.022	2.274	2.266
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	527	545	218	836
d_b, Bicycle Delay [s]	29.82	29.09	43.65	18.62
I_b,int, Bicycle LOS Score for Intersection	2.371	2.358	2.112	2.682
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.903

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	82	1411	30	443	1355	38	41	195	129	62	265	619
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1411	30	443	1355	38	41	195	129	62	265	619
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	353	8	111	339	10	10	49	32	16	66	155
Total Analysis Volume [veh/h]	82	1411	30	443	1355	38	41	195	129	62	265	619
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	50	50	16	59	59	32	32	32	32	32	52
g / C, Green / Cycle	0.06	0.45	0.45	0.15	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.48
(v / s)_i Volume / Saturation Flow Rate	0.05	0.39	0.39	0.13	0.36	0.02	0.02	0.10	0.07	0.03	0.14	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	856	811	513	2054	973	352	559	529	412	559	858
d1, Uniform Delay [s]	51.30	27.25	27.16	45.84	18.03	11.85	28.04	30.53	29.51	28.37	31.84	22.92
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	14.08	11.51	11.72	4.48	1.68	0.08	0.15	0.37	0.24	0.17	0.63	5.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.87	0.86	0.86	0.66	0.04	0.12	0.35	0.24	0.15	0.47	0.72
d, Delay for Lane Group [s/veh]	65.37	38.76	38.88	50.32	19.71	11.93	28.18	30.90	29.75	28.54	32.46	28.13
Lane Group LOS	E	D	D	D	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.63	19.66	18.54	6.20	12.21	0.45	0.80	4.11	2.63	1.22	5.84	13.59
50th-Percentile Queue Length [ft/ln]	65.68	491.55	463.52	155.09	305.27	11.32	19.93	102.83	65.70	30.44	146.11	339.80
95th-Percentile Queue Length [veh/ln]	4.73	26.93	25.60	10.29	17.94	0.82	1.44	7.40	4.73	2.19	9.81	19.64
95th-Percentile Queue Length [ft/ln]	118.22	673.35	640.06	257.20	448.54	20.38	35.88	185.09	118.26	54.78	245.22	490.95

**Movement, Approach, & Intersection Results**

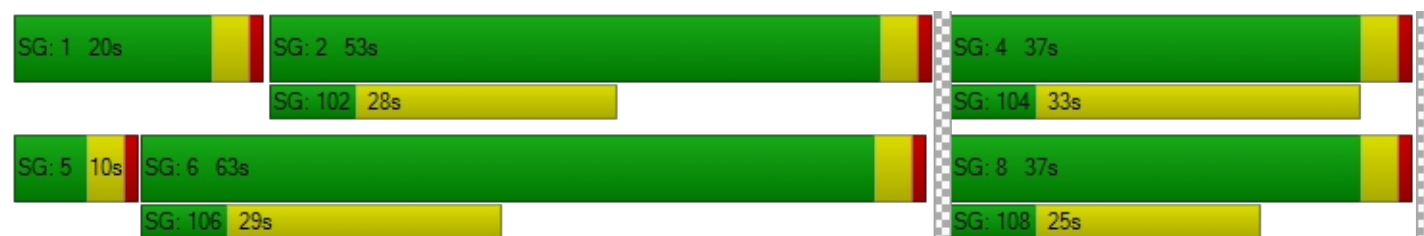
d_M, Delay for Movement [s/veh]	65.37	38.82	38.88	50.32	19.71	11.93	28.18	30.90	29.75	28.54	32.46	28.13
Movement LOS	E	D	D	D	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	40.25			26.94			30.19			29.37		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	32.02											
Intersection LOS	C											
Intersection V/C	0.903											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.996			3.206			2.323			2.624		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.816			3.074			2.162			3.121		
Bicycle LOS	C			C			B			C		

**Sequence**


Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	39.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.689

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	454	432	134	117	300	19	23	361	293	84	499	147
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	454	432	134	117	300	19	23	361	293	84	499	147
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	108	34	29	75	5	6	90	73	21	125	37
Total Analysis Volume [veh/h]	454	432	134	117	300	19	23	361	293	84	499	147
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	43	0	0	42	0	0	25	25	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	37	23	23	65	23	23	23
g / C, Green / Cycle	0.34	0.34	0.34	0.34	0.34	0.21	0.21	0.59	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.25	0.25	0.07	0.07	0.18	0.01	0.19	0.16	0.05	0.18	0.17
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	609	609	609	609	609	111	406	1059	92	406	384
d1, Uniform Delay [s]	31.85	31.85	25.94	25.68	29.18	34.38	41.90	11.10	35.60	41.45	40.78
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.23	0.50	0.11	0.20	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.42	7.42	0.83	0.70	3.20	0.91	12.89	0.65	26.10	8.92	5.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	0.73	0.22	0.19	0.52	0.21	0.89	0.28	0.91	0.85	0.79
d, Delay for Lane Group [s/veh]	39.26	39.26	26.77	26.38	32.38	35.28	54.79	11.74	61.70	50.36	46.18
Lane Group LOS	D	D	C	C	C	D	D	B	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	11.42	11.42	2.65	2.28	7.25	0.52	10.87	3.58	2.53	9.88	8.23
50th-Percentile Queue Length [ft/ln]	285.54	285.54	66.13	57.09	181.22	13.00	271.64	89.41	63.24	247.09	205.87
95th-Percentile Queue Length [veh/ln]	16.96	16.96	4.76	4.11	11.66	0.94	16.27	6.44	4.55	15.04	12.94
95th-Percentile Queue Length [ft/ln]	424.11	424.11	119.04	102.76	291.61	23.41	406.79	160.94	113.83	375.99	323.52

**Movement, Approach, & Intersection Results**

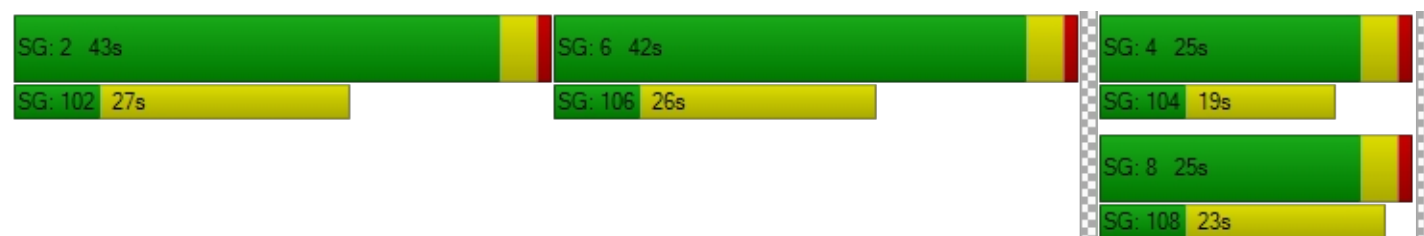
d_M, Delay for Movement [s/veh]	39.26	39.26	26.77	26.38	32.38	32.38	35.28	54.79	11.74	61.70	49.07	46.18
Movement LOS	D	D	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	37.62			30.77			35.50			49.94		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	39.22											
Intersection LOS	D											
Intersection V/C	0.689											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.674			2.320			2.631			2.468		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			691			382			382		
d_b, Bicycle Delay [s]	22.91			23.56			36.00			36.00		
I_b,int, Bicycle LOS Score for Intersection	3.243			2.279			2.677			2.162		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.410

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	28	236	180	411	474	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	236	180	411	474	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	59	45	103	119	6
Total Analysis Volume [veh/h]	28	236	180	411	474	23
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	46	46	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	85	85	85	85
g / C, Green / Cycle	0.15	0.15	0.78	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.10	0.22	0.25	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	272	272	1275	1474	1474	1396
d1, Uniform Delay [s]	40.11	45.45	3.07	3.52	3.68	2.80
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.13	0.23	0.47	0.58	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.87	0.14	0.28	0.32	0.02
d, Delay for Lane Group [s/veh]	40.28	53.58	3.30	3.99	4.25	2.82
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.67	6.86	0.88	2.28	2.75	0.10
50th-Percentile Queue Length [ft/ln]	16.66	171.51	21.92	56.91	68.64	2.52
95th-Percentile Queue Length [veh/ln]	1.20	11.16	1.58	4.10	4.94	0.18
95th-Percentile Queue Length [ft/ln]	29.98	278.90	39.45	102.44	123.55	4.54

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	40.28	53.58	3.30	3.99	4.25	2.82
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	52.17		3.78		4.19	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.38					
Intersection LOS	B					
Intersection V/C	0.410					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.358	2.373	2.254
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.108	4.952
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 64s

SG: 101 26s

SG: 4 46s

SG: 104 21s

SG: 8 46s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.863

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	192	1263	108	148	1142	29	53	616	178	162	822	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	1263	108	148	1142	29	53	616	178	162	822	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	316	27	37	286	7	13	154	45	41	206	61
Total Analysis Volume [veh/h]	192	1263	108	148	1142	29	53	616	178	162	822	242
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	47	47	45	35	35	45	37	37
g / C, Green / Cycle	0.51	0.42	0.42	0.51	0.42	0.42	0.41	0.32	0.32	0.41	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.37	0.37	0.08	0.32	0.32	0.03	0.22	0.21	0.09	0.30	0.28
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	526	802	759	389	802	759	331	612	580	491	632	599
d1, Uniform Delay [s]	14.58	29.38	29.07	14.19	26.97	26.87	19.49	32.56	31.85	20.79	34.93	33.86
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.15	0.12
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.95	13.76	13.00	0.61	6.47	6.62	0.22	1.41	1.18	0.39	6.60	3.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.89	0.87	0.38	0.75	0.75	0.16	0.69	0.64	0.33	0.90	0.83
d, Delay for Lane Group [s/veh]	16.53	43.15	42.07	14.81	33.44	33.49	19.72	33.97	33.03	21.18	41.53	37.25
Lane Group LOS	B	D	D	B	C	C	B	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.86	19.80	18.15	2.00	14.50	13.62	0.84	9.97	8.51	2.73	15.31	12.60
50th-Percentile Queue Length [ft/ln]	71.43	495.06	453.73	49.90	362.42	340.60	21.07	249.23	212.84	68.34	382.81	314.94
95th-Percentile Queue Length [veh/ln]	5.14	27.10	25.14	3.59	20.74	19.68	1.52	15.15	13.30	4.92	21.73	18.42
95th-Percentile Queue Length [ft/ln]	128.58	677.51	628.40	89.82	518.52	491.93	37.93	378.69	332.46	123.01	543.24	460.46

**Movement, Approach, & Intersection Results**

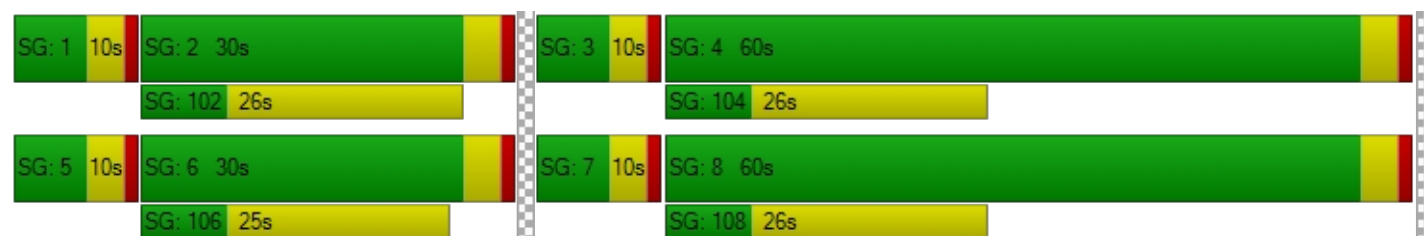
d_M, Delay for Movement [s/veh]	16.53	42.67	42.07	14.81	33.46	33.49	19.72	33.68	33.03	21.18	40.20	37.25
Movement LOS	B	D	D	B	C	C	B	C	C	C	D	D
d_A, Approach Delay [s/veh]	39.42			31.37			32.67			37.11		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	35.55											
Intersection LOS	D											
Intersection V/C	0.863											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.982			2.897			2.798			2.811		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.849			2.648			2.258			2.571		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.870

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	113	1094	132	125	938	108	248	731	104	205	1035	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	113	1094	132	125	938	108	248	731	104	205	1035	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	274	33	31	235	27	62	183	26	51	259	39
Total Analysis Volume [veh/h]	113	1094	132	125	938	108	248	731	104	205	1035	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	10	39	0	18	46	0	15	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	52	42	42	52	42	42	50	36	36	50	34	34
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.39	0.39	0.45	0.33	0.33	0.45	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.33	0.07	0.29	0.28	0.14	0.23	0.22	0.11	0.27	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	497	727	689	379	730	692	442	621	588	543	1173	556
d1, Uniform Delay [s]	16.23	31.64	31.12	16.35	29.30	28.89	19.10	32.43	32.01	18.58	36.15	28.82
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.16	0.14	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	14.36	12.58	0.50	6.92	6.43	1.12	2.17	1.75	0.43	2.37	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.88	0.85	0.33	0.75	0.72	0.56	0.71	0.67	0.38	0.88	0.28
d, Delay for Lane Group [s/veh]	17.30	46.00	43.70	16.85	36.21	35.32	20.22	34.59	33.75	19.02	38.52	29.09
Lane Group LOS	B	D	D	B	D	D	C	C	C	B	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.74	18.30	16.29	1.82	13.61	12.24	4.12	10.45	9.29	3.27	13.36	3.18
50th-Percentile Queue Length [ft/ln]	43.39	457.60	407.14	45.58	340.31	305.95	103.01	261.18	232.36	81.72	334.02	79.51
95th-Percentile Queue Length [veh/ln]	3.12	25.32	22.90	3.28	19.66	17.98	7.42	15.75	14.29	5.88	19.36	5.72
95th-Percentile Queue Length [ft/ln]	78.10	633.01	572.60	82.04	491.58	449.39	185.42	393.70	357.35	147.10	483.89	143.11

**Movement, Approach, & Intersection Results**

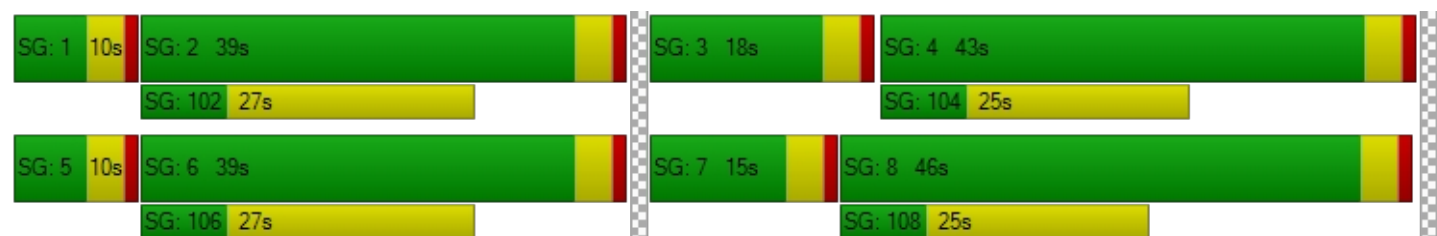
d_M, Delay for Movement [s/veh]	17.30	45.05	43.70	16.85	35.84	35.32	20.22	34.26	33.75	19.02	38.52	29.09
Movement LOS	B	D	D	B	D	D	C	C	C	B	D	C
d_A, Approach Delay [s/veh]	42.57			33.77			31.00			34.60		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	35.76											
Intersection LOS	D											
Intersection V/C	0.870											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.914			2.945			2.830			2.921		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			636			764			709		
d_b, Bicycle Delay [s]	25.57			25.57			21.02			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.664			2.526			2.453			2.712		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	35.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	153	866	142	83	616	127	165	803	127	287	1160	122
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	153	866	142	83	616	127	165	803	127	287	1160	122
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	217	36	21	154	32	41	201	32	72	290	31
Total Analysis Volume [veh/h]	153	866	142	83	616	127	165	803	127	287	1160	122
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	35	0	10	30	0	16	50	0	15	49	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	39	39	49	37	37	12	39	39	11	38	38
g / C, Green / Cycle	0.44	0.35	0.35	0.44	0.33	0.33	0.11	0.35	0.35	0.10	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.09	0.23	0.08	0.05	0.21	0.19	0.09	0.26	0.25	0.08	0.31	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	579	1346	637	547	635	602	195	665	630	348	1297	614
d1, Uniform Delay [s]	18.76	29.75	24.93	18.00	30.76	30.30	48.19	31.32	30.81	48.63	34.39	25.63
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.18	0.16	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.11	2.38	0.81	0.13	4.48	4.08	9.67	2.63	2.06	4.93	2.42	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.26	0.64	0.22	0.15	0.62	0.58	0.85	0.74	0.70	0.82	0.89	0.20
d, Delay for Lane Group [s/veh]	19.88	32.13	25.74	18.13	35.24	34.38	57.86	33.95	32.87	53.56	36.81	25.79
Lane Group LOS	B	C	C	B	D	C	E	C	C	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.55	9.89	2.74	1.25	9.43	8.27	4.95	11.67	10.29	4.09	14.84	2.28
50th-Percentile Queue Length [ft/ln]	63.75	247.23	68.48	31.33	235.78	206.75	123.83	291.69	257.14	102.31	371.02	57.12
95th-Percentile Queue Length [veh/ln]	4.59	15.05	4.93	2.26	14.47	12.99	8.60	17.27	15.55	7.37	21.16	4.11
95th-Percentile Queue Length [ft/ln]	114.76	376.16	123.26	56.39	361.69	324.65	215.07	431.74	388.63	184.16	528.97	102.81

**Movement, Approach, & Intersection Results**

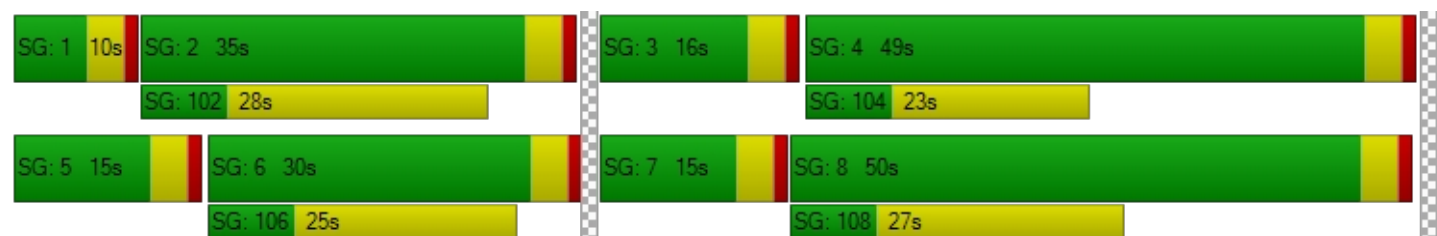
d_M, Delay for Movement [s/veh]	19.88	32.13	25.74	18.13	34.93	34.38	57.86	33.53	32.87	53.56	36.81	25.79
Movement LOS	B	C	C	B	C	C	E	C	C	D	D	C
d_A, Approach Delay [s/veh]	29.73			33.16			37.12			39.02		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.21											
Intersection LOS	D											
Intersection V/C	0.771											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.818			2.695			2.881			3.009		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			473			836			818		
d_b, Bicycle Delay [s]	28.37			32.07			18.62			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.517			2.241			2.463			2.854		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	11	63	44	455	62	88	68	920	13	53	1449	479
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	63	44	455	62	88	68	920	13	53	1449	479
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	11	114	16	22	17	230	3	13	362	120
Total Analysis Volume [veh/h]	11	63	44	455	62	88	68	920	13	53	1449	479
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	19	28	74	74	74	64	64	87
g / C, Green / Cycle	0.05	0.05	0.05	0.17	0.26	0.67	0.67	0.67	0.58	0.58	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.02	0.13	0.08	0.04	0.25	0.25	0.03	0.38	0.27
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	102	96	593	467	824	1269	1202	871	2217	1421
d1, Uniform Delay [s]	49.60	50.99	50.53	43.62	32.93	6.30	8.12	8.10	9.84	15.43	3.33
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.13
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	6.03	3.35	2.11	0.39	0.04	0.86	0.90	0.13	1.52	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.62	0.46	0.77	0.32	0.08	0.38	0.38	0.06	0.65	0.34
d, Delay for Lane Group [s/veh]	50.77	57.02	53.89	45.74	33.32	6.35	8.98	9.01	9.97	16.95	3.49
Lane Group LOS	D	E	D	D	C	A	A	A	A	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.31	1.87	1.26	6.06	3.29	0.52	4.97	4.69	0.57	11.98	2.38
50th-Percentile Queue Length [ft/ln]	7.75	46.69	31.62	151.46	82.13	13.06	124.14	117.20	14.23	299.45	59.41
95th-Percentile Queue Length [veh/ln]	0.56	3.36	2.28	10.10	5.91	0.94	8.62	8.24	1.02	17.65	4.28
95th-Percentile Queue Length [ft/ln]	13.94	84.04	56.91	252.38	147.83	23.50	215.50	205.97	25.61	441.35	106.94

**Movement, Approach, & Intersection Results**

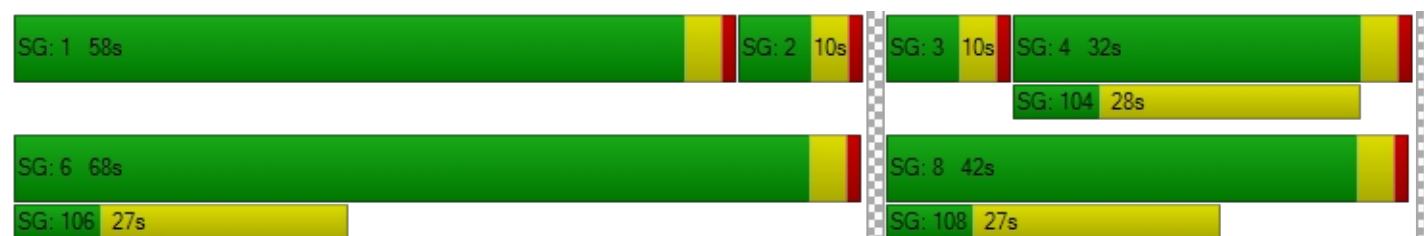
d_M, Delay for Movement [s/veh]	50.77	57.02	53.89	45.74	33.32	33.32	6.35	8.99	9.01	9.97	16.95	3.49
Movement LOS	D	E	D	D	C	C	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	55.27			42.66			8.81			13.51		
Approach LOS	E			D			A			B		
d_I, Intersection Delay [s/veh]	18.33											
Intersection LOS	B											
Intersection V/C	0.628											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.276			2.495			2.822			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.754			2.558			2.385			3.194		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	294	273	235	66	165	63	60	1105	141	192	1602	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	294	273	235	66	165	63	60	1105	141	192	1602	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	68	59	17	41	16	15	276	35	48	401	27
Total Analysis Volume [veh/h]	294	273	235	66	165	63	60	1105	141	192	1602	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	40	0	10	30	0	12	46	0	14	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	20	20	29	9	9	73	62	62	73	64	64
g / C, Green / Cycle	0.27	0.18	0.18	0.27	0.09	0.09	0.66	0.56	0.56	0.66	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.13	0.04	0.06	0.06	0.03	0.34	0.33	0.11	0.46	0.46
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	474	349	330	335	163	155	606	1063	1007	852	1095	1038
d1, Uniform Delay [s]	35.26	42.86	42.22	30.62	49.10	48.94	6.61	16.26	15.96	7.15	18.37	18.34
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.33	3.88	2.84	0.28	6.29	5.60	0.07	2.64	2.55	0.61	6.23	6.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.62	0.78	0.71	0.20	0.74	0.70	0.10	0.61	0.59	0.23	0.80	0.80
d, Delay for Lane Group [s/veh]	36.58	46.74	45.06	30.90	55.39	54.53	6.68	18.89	18.50	7.77	24.60	24.83
Lane Group LOS	D	D	D	C	E	D	A	B	B	A	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.03	7.41	6.23	1.36	3.50	3.12	0.48	11.23	10.09	1.76	18.30	17.35
50th-Percentile Queue Length [ft/ln]	175.74	185.35	155.71	34.07	87.41	78.01	11.96	280.77	252.17	44.02	457.47	433.82
95th-Percentile Queue Length [veh/ln]	11.38	11.88	10.32	2.45	6.29	5.62	0.86	16.73	15.30	3.17	25.31	24.18
95th-Percentile Queue Length [ft/ln]	284.44	296.99	258.03	61.33	157.34	140.42	21.53	418.17	382.39	79.23	632.85	604.61

**Movement, Approach, & Intersection Results**

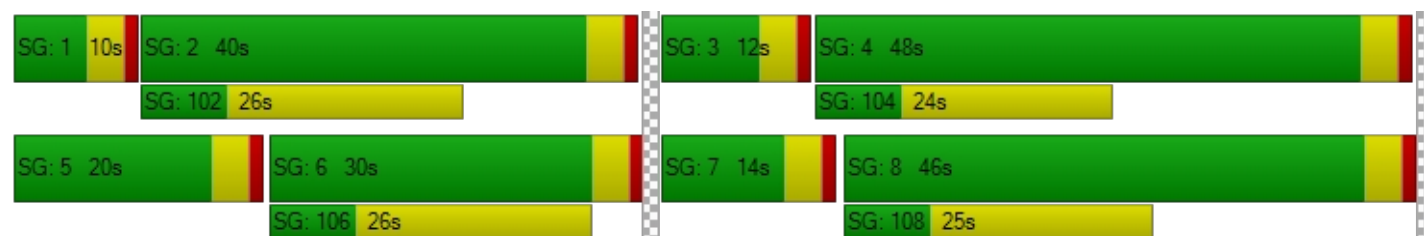
d_M, Delay for Movement [s/veh]	36.58	46.74	45.06	30.90	55.16	54.53	6.68	18.73	18.50	7.77	24.70	24.83
Movement LOS	D	D	D	C	E	D	A	B	B	A	C	C
d_A, Approach Delay [s/veh]	42.52			49.58			18.16			23.00		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	26.98											
Intersection LOS	C											
Intersection V/C	0.802											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.721			2.370			2.989			2.973		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			473			764			800		
d_b, Bicycle Delay [s]	24.89			32.07			21.02			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.883			1.802			2.637			3.128		
Bicycle LOS	C			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	246	208	56	120	73	49	1281	93	114	1571	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	246	208	56	120	73	49	1281	93	114	1571	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	62	52	14	30	18	12	320	23	29	393	14
Total Analysis Volume [veh/h]	89	246	208	56	120	73	49	1281	93	114	1571	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	63	0	0	63	0	24	37	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	85	75	75	85	76	76
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.16	0.77	0.68	0.68	0.77	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.12	0.03	0.11	0.03	0.37	0.37	0.06	0.44	0.44
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	132	295	279	89	279	1035	1296	1228	1127	1316	1247
d1, Uniform Delay [s]	41.29	45.08	44.37	40.51	43.96	2.94	8.90	8.80	3.05	9.29	9.25
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.83	6.14	3.93	7.08	3.05	0.02	1.68	1.70	0.18	2.35	2.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.67	0.83	0.74	0.63	0.69	0.05	0.55	0.54	0.10	0.64	0.63
d, Delay for Lane Group [s/veh]	47.12	51.23	48.30	47.58	47.01	2.95	10.58	10.50	3.23	11.64	11.70
Lane Group LOS	D	D	D	D	D	A	B	B	A	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.36	6.98	5.70	1.50	5.19	0.21	8.37	7.72	0.55	10.57	9.97
50th-Percentile Queue Length [ft/ln]	59.01	174.54	142.41	37.51	129.81	5.27	209.34	192.93	13.82	264.14	249.22
95th-Percentile Queue Length [veh/ln]	4.25	11.32	9.61	2.70	8.93	0.38	13.12	12.27	0.99	15.90	15.15
95th-Percentile Queue Length [ft/ln]	106.23	282.88	240.27	67.51	223.24	9.49	327.98	306.82	24.87	397.41	378.67

**Movement, Approach, & Intersection Results**

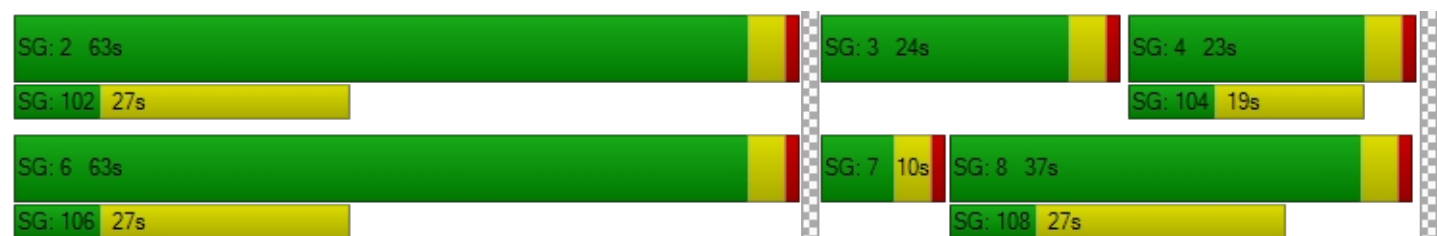
d_M, Delay for Movement [s/veh]	47.12	51.23	48.30	47.58	47.01	47.01	2.95	10.54	10.50	3.23	11.67	11.70
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	49.43			47.14			10.28			11.12		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	18.35											
Intersection LOS	B											
Intersection V/C	0.648											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.466	2.194	3.051	3.029
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1073	1073	600	345
d_b, Bicycle Delay [s]	11.82	11.82	26.95	37.64
I_b,int, Bicycle LOS Score for Intersection	2.456	1.970	2.734	2.994
Bicycle LOS	B	A	B	C

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.843

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	409	69	317	394	554	447	888	53	126	1088	279
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	409	69	317	394	554	447	888	53	126	1088	279
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	102	17	79	99	139	112	222	13	32	272	70
Total Analysis Volume [veh/h]	89	409	69	317	394	554	447	888	53	126	1088	279
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	15	38	38	20	45	0	16	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	33	33	11	37	57	16	41	41	9	34	34
g / C, Green / Cycle	0.06	0.30	0.30	0.10	0.33	0.51	0.15	0.37	0.37	0.09	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.04	0.09	0.10	0.31	0.13	0.23	0.03	0.07	0.29	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	114	1123	532	352	1264	927	510	1414	670	155	1189	563
d1, Uniform Delay [s]	50.81	30.62	28.41	48.97	27.35	18.72	46.05	28.31	22.36	49.41	36.43	30.77
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.89	0.92	0.50	8.41	0.64	2.84	4.94	0.46	0.05	9.61	3.26	0.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.78	0.36	0.13	0.90	0.31	0.60	0.88	0.63	0.08	0.81	0.92	0.50
d, Delay for Lane Group [s/veh]	61.70	31.53	28.91	57.38	27.99	21.56	50.99	28.78	22.41	59.02	39.69	31.45
Lane Group LOS	E	C	C	E	C	C	D	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.76	4.42	1.41	4.70	3.96	10.29	6.30	9.53	0.90	3.81	14.34	6.09
50th-Percentile Queue Length [ft/ln]	68.93	110.43	35.32	117.56	99.04	257.35	157.58	238.21	22.47	95.24	358.59	152.14
95th-Percentile Queue Length [veh/ln]	4.96	7.86	2.54	8.26	7.13	15.56	10.42	14.59	1.62	6.86	20.55	10.13
95th-Percentile Queue Length [ft/ln]	124.07	196.60	63.57	206.46	178.28	388.90	260.51	364.76	40.44	171.43	513.87	253.29

**Movement, Approach, & Intersection Results**

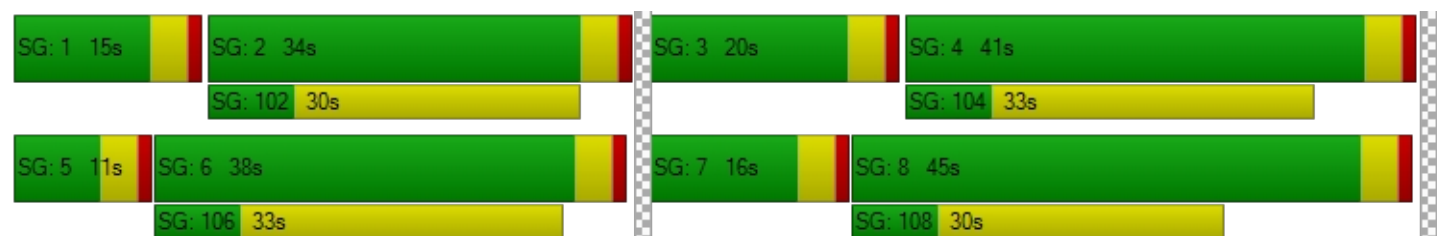
d_M, Delay for Movement [s/veh]	61.70	31.53	28.91	57.38	27.99	21.56	50.99	28.78	22.41	59.02	39.69	31.45
Movement LOS	E	C	C	E	C	C	D	C	C	E	D	C
d_A, Approach Delay [s/veh]	35.95			32.54			35.69			39.78		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	36.17											
Intersection LOS	D											
Intersection V/C	0.843											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.648			2.938			3.038			2.912		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			618			745			673		
d_b, Bicycle Delay [s]	29.09			26.25			21.64			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.027			2.603			2.705			2.791		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	31	44	54	0	260	132	52	401	0
Total Analysis Volume [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	70	0	0	30	0	10	40	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	62	62	15	81
g / C, Green / Cycle		0.19	0.19	0.56	0.56	0.14	0.74
(v / s)_i Volume / Saturation Flow Rate		0.17	0.12	0.27	0.29	0.12	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		344	344	2143	1015	244	2797
d1, Uniform Delay [s]		43.15	40.91	14.38	14.78	46.46	6.62
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.75	1.91	0.79	1.90	8.31	0.86
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.63	0.48	0.52	0.85	0.57
d, Delay for Lane Group [s/veh]		49.89	42.82	15.17	16.68	54.77	7.48
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.47	5.57	7.69	8.31	6.13	7.50
50th-Percentile Queue Length [ft/ln]		211.77	139.20	192.20	207.85	153.13	187.62
95th-Percentile Queue Length [veh/ln]		13.24	9.44	12.24	13.04	10.18	12.00
95th-Percentile Queue Length [ft/ln]		331.10	235.95	305.89	326.07	254.60	299.93

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	49.89	49.89	42.82	0.00	15.17	16.68	54.77	7.48	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			46.92			15.68			12.93		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.54											
Intersection LOS	B											
Intersection V/C	0.660											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.323	1.976	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1200	473	655
d_b, Bicycle Delay [s]	55.00	8.80	32.07	24.89
I_b,int, Bicycle LOS Score for Intersection	4.132	2.411	2.420	3.054
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	0	124	0	0	0	37	249	0	0	315	52
Total Analysis Volume [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	79	0	0	0	0	0	10	31	0	0	21	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.25	0.25	0.25		0.10	0.68	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.39	0.41
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	445	445	445		183	2584	1030	976
d1, Uniform Delay [s]	39.42	39.42	39.42		48.39	7.62	18.77	19.45
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.55	4.55	4.55		8.53	0.44	4.19	5.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.82	0.39	0.71	0.75
d, Delay for Lane Group [s/veh]	43.97	43.97	43.97		56.92	8.06	22.96	24.78
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.15	10.15	10.15		4.42	4.80	14.46	15.19
50th-Percentile Queue Length [ft/ln]	253.83	253.83	253.83		110.60	120.05	361.55	379.72
95th-Percentile Queue Length [veh/ln]	15.38	15.38	15.38		7.87	8.40	20.70	21.58
95th-Percentile Queue Length [ft/ln]	384.47	384.47	384.47		196.84	209.90	517.47	539.50

**Movement, Approach, & Intersection Results**

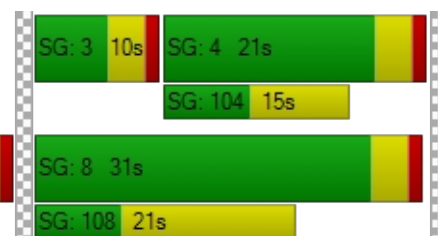
d_M, Delay for Movement [s/veh]	43.97	0.00	43.97	0.00	0.00	0.00	56.92	8.06	0.00	0.00	23.72	24.78
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	43.97			0.00			14.42			23.87		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	27.06											
Intersection LOS	C											
Intersection V/C	0.785											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.317	1.781	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	491	309
d_b, Bicycle Delay [s]	55.00	55.00	31.31	39.31
I_b,int, Bicycle LOS Score for Intersection	5.999	4.132	2.503	2.770
Bicycle LOS	F	D	B	C

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.500

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	47	1127	82	58	901	47	19	45	50	102	53	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	1127	82	58	901	47	19	45	50	102	53	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	282	21	15	225	12	5	11	13	26	13	21
Total Analysis Volume [veh/h]	47	1127	82	58	901	47	19	45	50	102	53	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	50	0	0	50	0	0	60	0	0	60	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	85	85	85	85	17	17
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.33	0.32	0.03	0.26	0.25	0.06	0.13
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1269	1473	1396	1209	1473	1396	311	320
d1, Uniform Delay [s]	2.84	4.13	4.08	2.86	3.73	3.71	42.14	45.54
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.90	0.92	0.07	0.61	0.63	0.72	3.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.43	0.42	0.05	0.33	0.33	0.37	0.75
d, Delay for Lane Group [s/veh]	2.89	5.03	5.00	2.93	4.34	4.33	42.86	49.09
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	4.10	3.77	0.26	2.89	2.68	2.86	6.68
50th-Percentile Queue Length [ft/ln]	5.28	102.51	94.34	6.59	72.13	67.01	71.49	167.00
95th-Percentile Queue Length [veh/ln]	0.38	7.38	6.79	0.47	5.19	4.82	5.15	10.92
95th-Percentile Queue Length [ft/ln]	9.51	184.52	169.82	11.87	129.84	120.62	128.68	272.96

**Movement, Approach, & Intersection Results**

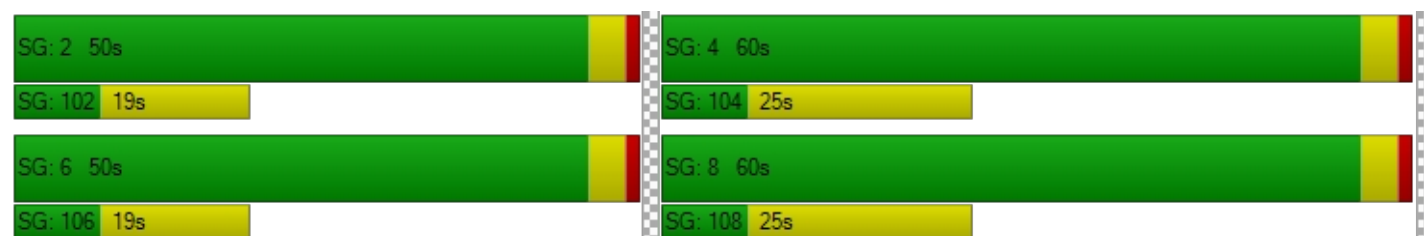
d_M, Delay for Movement [s/veh]	2.89	5.02	5.00	2.93	4.34	4.33	42.86	42.86	42.86	49.09	49.09	49.09
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.94			4.26			42.86			49.09		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.38											
Intersection LOS	B											
Intersection V/C	0.500											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.905			2.773			1.919			2.014		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			836			1018			1018		
d_b, Bicycle Delay [s]	18.62			18.62			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.596			2.390			1.748			1.956		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.724

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	149	1090	203	49	1046	112	138	613	129	228	771	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	1090	203	49	1046	112	138	613	129	228	771	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	273	51	12	262	28	35	153	32	57	193	18
Total Analysis Volume [veh/h]	149	1090	203	49	1046	112	138	613	129	228	771	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	56	0	11	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	49	40	40	49	39	39	54	39	39	54	43	43
g / C, Green / Cycle	0.44	0.36	0.36	0.44	0.35	0.35	0.49	0.35	0.35	0.49	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.08	0.29	0.11	0.03	0.32	0.31	0.08	0.16	0.07	0.13	0.20	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	344	1376	652	424	665	630	686	1340	635	746	1468	696
d1, Uniform Delay [s]	18.71	31.42	25.25	17.64	34.10	33.59	15.77	27.52	24.86	16.68	26.00	21.58
k, delay calibration	0.11	0.11	0.11	0.11	0.22	0.20	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.86	1.07	0.27	0.12	9.48	7.34	0.14	1.13	0.72	1.06	1.35	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.79	0.31	0.12	0.91	0.88	0.20	0.46	0.20	0.31	0.53	0.10
d, Delay for Lane Group [s/veh]	19.57	32.48	25.52	17.76	43.58	40.93	15.92	28.64	25.58	17.74	27.35	21.87
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.39	12.91	3.85	0.73	16.80	14.87	1.94	6.38	2.47	3.57	7.94	1.23
50th-Percentile Queue Length [ft/ln]	59.72	322.63	96.29	18.23	420.09	371.85	48.60	159.50	61.83	89.18	198.43	30.70
95th-Percentile Queue Length [veh/ln]	4.30	18.80	6.93	1.31	23.53	21.20	3.50	10.52	4.45	6.42	12.56	2.21
95th-Percentile Queue Length [ft/ln]	107.50	469.91	173.32	32.82	588.16	529.98	87.47	263.06	111.30	160.53	313.94	55.26

**Movement, Approach, & Intersection Results**

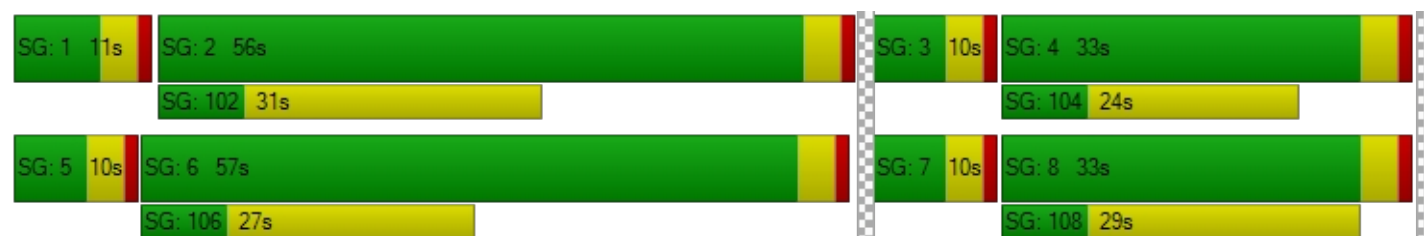
d_M, Delay for Movement [s/veh]	19.57	32.48	25.52	17.76	42.46	40.93	15.92	28.64	25.58	17.74	27.35	21.87
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	30.17			41.32			26.20			24.94		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.12											
Intersection LOS	C											
Intersection V/C	0.724											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.045			2.878			2.851			2.803		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			964			527			527		
d_b, Bicycle Delay [s]	15.29			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.749			2.555			2.286			2.442		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:  
Analysis Method:  
Analysis Period:

Signalized  
HCM 6th Edition  
15 minutes

Delay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):

35.1  
D  
0.684

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	144	1033	215	47	820	92	119	660	98	358	852	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	1033	215	47	820	92	119	660	98	358	852	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	258	54	12	205	23	30	165	25	90	213	22
Total Analysis Volume [veh/h]	144	1033	215	47	820	92	119	660	98	358	852	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	36	0	34	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	35	35	35	31	31	31	9	41	41	14	46	46
g / C, Green / Cycle	0.32	0.32	0.32	0.28	0.28	0.28	0.08	0.37	0.37	0.13	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.08	0.27	0.12	0.03	0.25	0.24	0.07	0.17	0.05	0.10	0.22	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	269	1200	569	207	535	507	150	1406	666	442	1568	743
d1, Uniform Delay [s]	28.01	35.38	29.26	29.18	37.94	37.49	49.51	26.45	23.12	46.81	24.47	19.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.65	1.94	0.42	0.55	5.37	4.38	8.96	1.13	0.47	3.59	1.36	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.53	0.86	0.38	0.23	0.89	0.86	0.79	0.47	0.15	0.81	0.54	0.12
d, Delay for Lane Group [s/veh]	29.65	37.33	29.68	29.73	43.31	41.87	58.47	27.58	23.58	50.39	25.83	20.26
Lane Group LOS	C	D	C	C	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.95	13.12	4.47	0.95	12.94	11.58	3.58	6.75	1.78	4.97	8.55	1.42
50th-Percentile Queue Length [ft/ln]	73.66	327.94	111.74	23.82	323.59	289.44	89.45	168.76	44.52	124.29	213.82	35.59
95th-Percentile Queue Length [veh/ln]	5.30	19.06	7.94	1.72	18.84	17.16	6.44	11.01	3.21	8.63	13.35	2.56
95th-Percentile Queue Length [ft/ln]	132.58	476.43	198.42	42.88	471.10	428.95	161.01	275.28	80.14	215.71	333.73	64.06

**Movement, Approach, & Intersection Results**

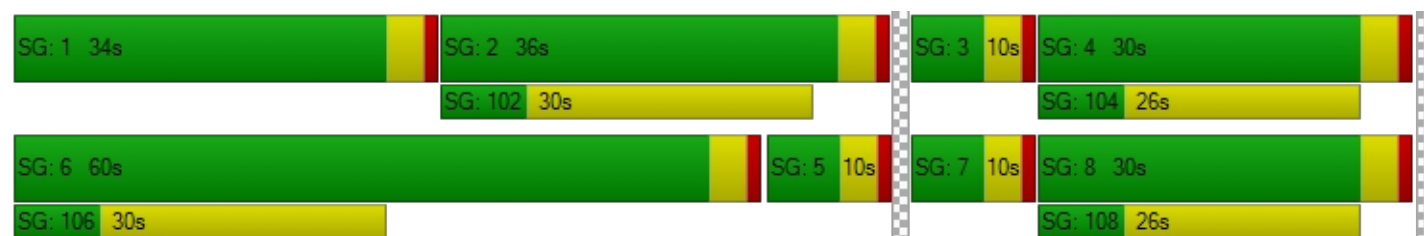
d_M, Delay for Movement [s/veh]	29.65	37.33	29.68	29.73	42.71	41.87	58.47	27.58	23.58	50.39	25.83	20.26
Movement LOS	C	D	C	C	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	35.35			41.99			31.32			32.25		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	35.09											
Intersection LOS	D											
Intersection V/C	0.684											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.896			2.738			2.875			2.927		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			1018			473			473		
d_b, Bicycle Delay [s]	27.65			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.708			2.351			2.283			2.629		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.001

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	60	1407	51	22	77	1407	61	116	87	68	134	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	1407	51	22	77	1407	61	116	87	68	134	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	352	13	6	19	352	15	29	22	17	34	4
Total Analysis Volume [veh/h]	60	1407	51	22	77	1407	61	116	87	68	134	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	79	0	0	79	0	0	31	0	0	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.40	0.39	0.01	0.04	0.78	0.15	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	72	1450	1374	1114	1450	1374	336	74	295
d1, Uniform Delay [s]	3.18	5.09	5.06	3.12	3.21	12.99	44.92	39.83	41.79
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	66.48	1.33	1.38	0.03	0.07	30.66	4.18	31.05	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.52	0.51	0.02	0.05	1.02	0.79	0.91	0.50
d, Delay for Lane Group [s/veh]	69.66	6.42	6.44	3.15	3.28	43.65	49.09	70.89	43.12
Lane Group LOS	E	A	A	A	A	F	D	E	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.60	5.96	5.59	0.11	0.38	36.96	7.38	2.24	3.78
50th-Percentile Queue Length [ft/ln]	39.98	148.91	139.70	2.68	9.44	923.94	184.58	55.97	94.55
95th-Percentile Queue Length [veh/ln]	2.88	9.96	9.46	0.19	0.68	48.01	11.84	4.03	6.81
95th-Percentile Queue Length [ft/ln]	71.96	248.97	236.62	4.82	17.00	1200.33	295.99	100.75	170.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	69.66	6.43	6.44	3.15	3.28	43.65	49.09	49.09	49.09	70.89	43.12	43.12
Movement LOS	E	A	A	A	A	F	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	8.93			40.99			49.09			51.82		
Approach LOS	A			D			D			D		
d_I, Intersection Delay [s/veh]	28.39											
Intersection LOS	C											
Intersection V/C	1.001											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.747			2.979			2.719			2.113		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1364			1364			491			491		
d_b, Bicycle Delay [s]	5.57			5.57			31.31			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.812			2.802			1.995			1.918		
Bicycle LOS	C			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.536

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	127	1327	76	56	1217	68	74	40	93	100	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	1327	76	56	1217	68	74	40	93	100	52	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	332	19	14	304	17	19	10	23	25	13	12
Total Analysis Volume [veh/h]	127	1327	76	56	1217	68	74	40	93	100	52	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	57	0	0	57	0	0	53	0	0	53	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	87	87	87	87	87	87	15	15
g / C, Green / Cycle	0.79	0.79	0.79	0.79	0.79	0.79	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.07	0.38	0.38	0.03	0.35	0.34	0.12	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1249	1507	1428	1220	1507	1428	285	290
d1, Uniform Delay [s]	2.52	3.79	3.76	2.42	3.61	3.58	46.56	46.33
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	1.10	1.13	0.07	0.94	0.96	3.50	2.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.48	0.47	0.05	0.44	0.43	0.73	0.69
d, Delay for Lane Group [s/veh]	2.69	4.89	4.90	2.49	4.55	4.54	50.06	49.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.53	4.48	4.18	0.22	3.90	3.63	5.79	5.50
50th-Percentile Queue Length [ft/ln]	13.13	112.11	104.52	5.56	97.62	90.64	144.68	137.54
95th-Percentile Queue Length [veh/ln]	0.95	7.96	7.53	0.40	7.03	6.53	9.73	9.35
95th-Percentile Queue Length [ft/ln]	23.64	198.93	188.14	10.01	175.71	163.16	243.31	233.71

**Movement, Approach, & Intersection Results**

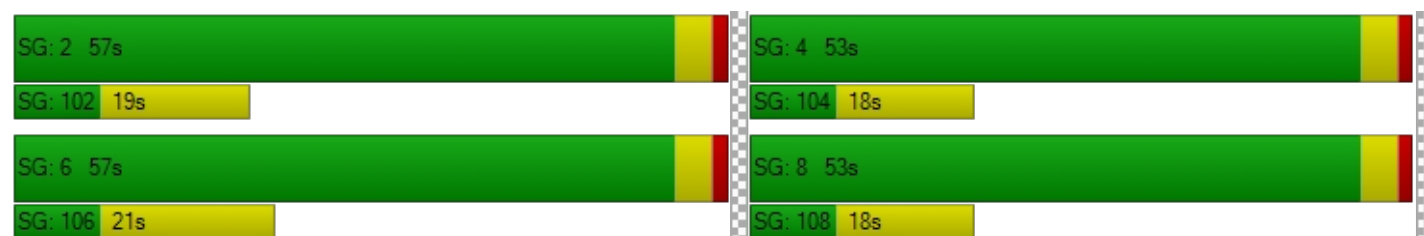
d_M, Delay for Movement [s/veh]	2.69	4.89	4.90	2.49	4.54	4.54	50.06	50.06	50.06	49.20	49.20	49.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.71			4.46			50.06			49.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.17											
Intersection LOS	B											
Intersection V/C	0.536											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.025			2.959			2.126			1.985		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			891			891		
d_b, Bicycle Delay [s]	14.77			14.77			16.91			16.91		
I_b,int, Bicycle LOS Score for Intersection	2.822			2.666			1.901			1.888		
Bicycle LOS	C			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.833

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	283	1346	233	202	1196	199	200	758	201	218	1075	186
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	1346	233	202	1196	199	200	758	201	218	1075	186
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	337	58	51	299	50	50	190	50	55	269	47
Total Analysis Volume [veh/h]	283	1346	233	202	1196	199	200	758	201	218	1075	186
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	43	0	11	41	0	18	39	0	17	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	39	39	7	37	37	14	35	35	13	34	34
g / C, Green / Cycle	0.08	0.35	0.35	0.06	0.34	0.34	0.13	0.32	0.32	0.12	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.08	0.35	0.13	0.06	0.30	0.14	0.11	0.13	0.11	0.12	0.19	0.10
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	286	1346	638	223	1277	605	229	1807	571	215	1764	557
d1, Uniform Delay [s]	50.45	35.51	26.34	51.18	34.70	28.15	47.15	29.59	28.88	48.42	32.32	29.24
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.05	11.35	0.35	12.97	2.50	0.45	10.05	0.72	1.71	31.61	1.58	1.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.99	1.00	0.37	0.91	0.90	0.41	0.87	0.42	0.35	1.01	0.61	0.33
d, Delay for Lane Group [s/veh]	72.49	46.86	26.69	64.15	37.20	28.60	57.19	30.31	30.59	80.03	33.89	30.85
Lane Group LOS	E	D	C	E	D	C	E	C	C	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.75	19.67	4.57	3.16	14.70	5.13	5.99	5.36	4.34	7.77	8.30	4.03
50th-Percentile Queue Length [ft/ln]	118.80	491.85	114.25	78.97	367.47	128.20	149.77	133.93	108.42	194.23	207.56	100.70
95th-Percentile Queue Length [veh/ln]	8.33	26.95	8.08	5.69	20.99	8.84	10.00	9.15	7.75	12.40	13.03	7.25
95th-Percentile Queue Length [ft/ln]	208.18	673.70	201.89	142.15	524.66	221.04	250.12	228.83	193.80	310.11	325.70	181.26

**Movement, Approach, & Intersection Results**

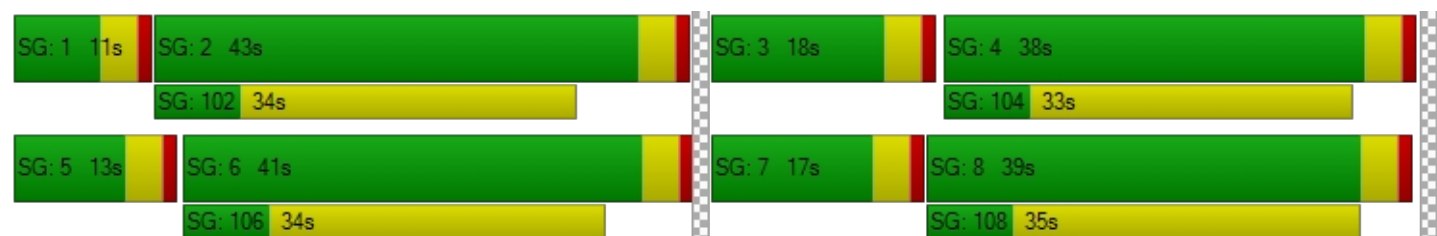
d_M, Delay for Movement [s/veh]	72.49	46.86	26.69	64.15	36.83	28.60	57.19	30.31	30.59	80.03	33.89	30.85
Movement LOS	E	D	C	E	D	C	E	C	C	F	C	C
d_A, Approach Delay [s/veh]	48.23			39.26			35.00			40.31		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	41.44											
Intersection LOS	D											
Intersection V/C	0.833											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.159			3.067			3.066			3.061		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			673			636			618		
d_b, Bicycle Delay [s]	22.91			24.22			25.57			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.096			2.438			2.197			2.373		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.910

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	247	1234	103	191	1024	192	212	732	147	258	834	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	247	1234	103	191	1024	192	212	732	147	258	834	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	309	26	48	256	48	53	183	37	65	209	35
Total Analysis Volume [veh/h]	247	1234	103	191	1024	192	212	732	147	258	834	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	49	0	10	42	0	14	37	0	14	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	40	40	50	34	34	15	38	38	10	33	33
g / C, Green / Cycle	0.45	0.36	0.36	0.45	0.31	0.31	0.13	0.34	0.34	0.09	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.14	0.32	0.06	0.11	0.27	0.11	0.12	0.19	0.09	0.07	0.27	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	446	1375	651	353	1178	558	242	1306	619	328	576	546
d1, Uniform Delay [s]	19.05	33.19	23.77	18.39	35.89	29.35	46.77	29.29	25.96	48.81	36.59	35.96
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	2.35	0.11	1.29	2.13	0.37	9.79	1.70	0.98	4.17	18.29	14.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.90	0.16	0.54	0.87	0.34	0.88	0.55	0.25	0.79	0.89	0.85
d, Delay for Lane Group [s/veh]	20.13	35.54	23.89	19.68	38.01	29.71	56.56	30.99	26.94	52.98	54.88	50.93
Lane Group LOS	C	D	C	B	D	C	E	C	C	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.09	15.63	1.84	3.08	13.10	3.97	6.33	7.98	3.09	3.65	15.83	13.71
50th-Percentile Queue Length [ft/ln]	102.27	390.73	45.88	77.00	327.49	99.18	158.13	199.45	77.34	91.19	395.66	342.81
95th-Percentile Queue Length [veh/ln]	7.36	22.11	3.30	5.54	19.04	7.14	10.45	12.61	5.57	6.57	22.35	19.79
95th-Percentile Queue Length [ft/ln]	184.09	552.82	82.59	138.61	475.88	178.52	261.24	315.25	139.21	164.14	558.76	494.63

**Movement, Approach, & Intersection Results**

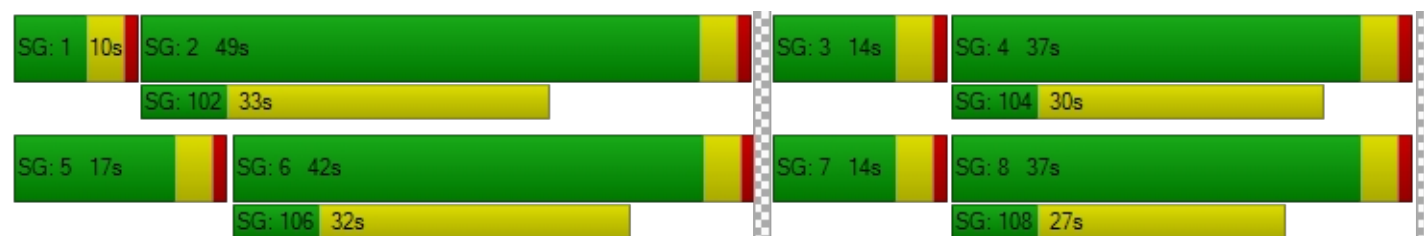
d_M, Delay for Movement [s/veh]	20.13	35.54	23.89	19.68	38.01	29.71	56.56	30.94	26.94	52.98	53.35	50.93
Movement LOS	C	D	C	B	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	32.38			34.39			35.38			53.00		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	38.31											
Intersection LOS	D											
Intersection V/C	0.910											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.952			2.949			2.962			3.021		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			691			600			600		
d_b, Bicycle Delay [s]	19.20			23.56			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.866			2.720			2.160			2.576		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	495	0	0	358	132	0	0	0	78	97	95
Total Analysis Volume [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	67	58	58		25	25	25
g / C, Green / Cycle	0.05	0.67	0.58	0.58		0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.35	0.34	0.36		0.17	0.10	0.21
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3825	2192	1038		448	946	448
d1, Uniform Delay [s]	45.76	8.29	13.63	14.04		34.11	31.41	35.72
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.43	0.50	1.20	2.88		1.96	0.29	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.52	0.60	0.63		0.70	0.41	0.85
d, Delay for Lane Group [s/veh]	47.19	8.80	14.83	16.92		36.07	31.69	40.18
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.97	6.50	9.16	9.89		7.03	3.92	9.19
50th-Percentile Queue Length [ft/ln]	24.28	162.62	229.07	247.29		175.72	98.04	229.65
95th-Percentile Queue Length [veh/ln]	1.75	10.69	14.13	15.05		11.38	7.06	14.16
95th-Percentile Queue Length [ft/ln]	43.71	267.19	353.18	376.24		284.41	176.47	353.91

**Movement, Approach, & Intersection Results**

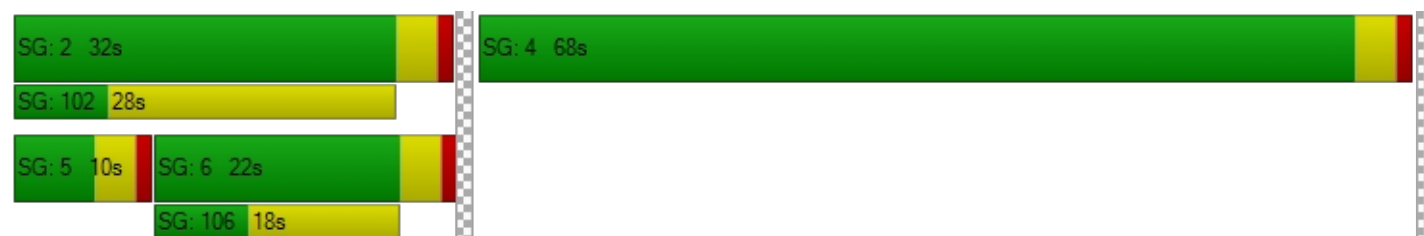
d_M, Delay for Movement [s/veh]	47.19	8.80	0.00	0.00	15.02	16.92	0.00	0.00	0.00	36.07	31.69	40.18
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	10.25			15.53			0.00			35.94		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.72											
Intersection LOS	B											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.203			2.399		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.692			2.636			4.132			2.450		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	309	0	0	310	86	0	0	0	43	147	157
Total Analysis Volume [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	53	42	42		39	39	39
g / C, Green / Cycle	0.07	0.53	0.42	0.42		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.28	0.29		0.21	0.20	0.35
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	3042	1607	761		695	734	695
d1, Uniform Delay [s]	45.79	13.89	23.05	23.55		23.92	23.46	28.92
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.40	2.11	5.13		0.68	0.55	9.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.41	0.66	0.69		0.55	0.51	0.90
d, Delay for Lane Group [s/veh]	57.11	14.29	25.16	28.69		24.61	24.01	38.49
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.41	10.05	10.87		7.03	6.72	15.51
50th-Percentile Queue Length [ft/ln]	72.68	135.28	251.28	271.87		175.69	168.12	387.74
95th-Percentile Queue Length [veh/ln]	5.23	9.23	15.25	16.28		11.38	10.98	21.97
95th-Percentile Queue Length [ft/ln]	130.82	230.66	381.26	407.08		284.38	274.44	549.20

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.11	14.29	0.00	0.00	25.68	28.69	0.00	0.00	0.00	24.61	24.23	38.49
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.58			26.34			0.00			30.74		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	25.03											
Intersection LOS	C											
Intersection V/C	0.794											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.224	2.395
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	620	0	1000
d_b, Bicycle Delay [s]	16.82	23.81	50.00	12.50
I_b,int, Bicycle LOS Score for Intersection	2.296	2.429	4.132	2.703
Bicycle LOS	B	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	349	54	71	377	0	181	75	37	0	0	0
Total Analysis Volume [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	10	67	25	25	25	
g / C, Green / Cycle	0.53	0.53	0.10	0.67	0.25	0.25	0.25	
(v / s)_i Volume / Saturation Flow Rate	0.25	0.12	0.08	0.26	0.21	0.16	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3020	954	348	3815	878	476	451	
d1, Uniform Delay [s]	14.65	12.57	44.10	7.44	35.40	33.31	30.59	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	0.56	4.52	0.31	2.05	1.36	0.42	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.23	0.81	0.40	0.83	0.63	0.33	
d, Delay for Lane Group [s/veh]	15.16	13.13	48.62	7.75	37.46	34.68	31.01	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.42	2.66	3.61	4.42	8.45	6.54	2.94	
50th-Percentile Queue Length [ft/ln]	160.43	66.42	90.34	110.53	211.19	163.57	73.60	
95th-Percentile Queue Length [veh/ln]	10.57	4.78	6.50	7.87	13.21	10.74	5.30	
95th-Percentile Queue Length [ft/ln]	264.29	119.55	162.61	196.73	330.35	268.44	132.48	

**Movement, Approach, & Intersection Results**

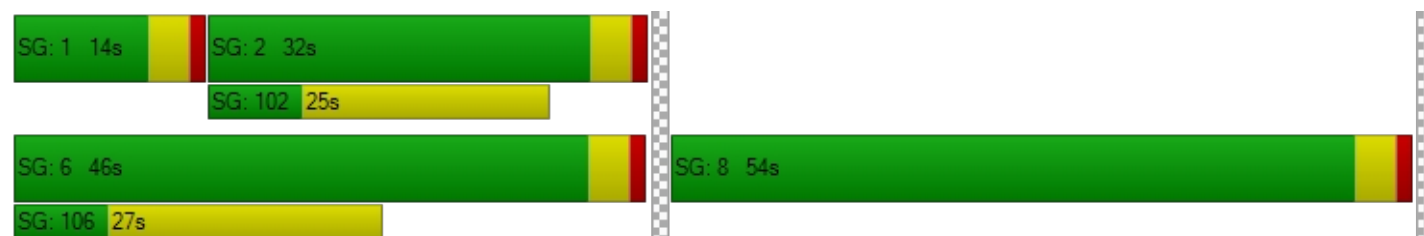
d_M, Delay for Movement [s/veh]	0.00	15.16	13.13	48.62	7.75	0.00	37.46	34.68	31.01	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	14.89			14.18			35.93			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	20.00											
Intersection LOS	C											
Intersection V/C	0.605											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.422			2.109		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.447			2.545			3.493			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	251	53	104	240	0	82	107	15	0	0	0
Total Analysis Volume [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.23	0.12	0.25	0.21	0.20	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1885	893	499	2579	434	458	434	
d1, Uniform Delay [s]	16.14	16.39	41.70	6.90	36.42	35.93	29.75	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.72	1.67	3.66	0.41	5.43	3.80	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.45	0.83	0.37	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.86	18.06	45.35	7.31	41.86	39.73	29.89	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.92	6.23	5.18	4.02	9.34	9.06	1.11	
50th-Percentile Queue Length [ft/ln]	147.95	155.77	129.55	100.51	233.48	226.54	27.68	
95th-Percentile Queue Length [veh/ln]	9.91	10.32	8.92	7.24	14.35	14.00	1.99	
95th-Percentile Queue Length [ft/ln]	247.70	258.12	222.88	180.92	358.78	349.96	49.82	

**Movement, Approach, & Intersection Results**

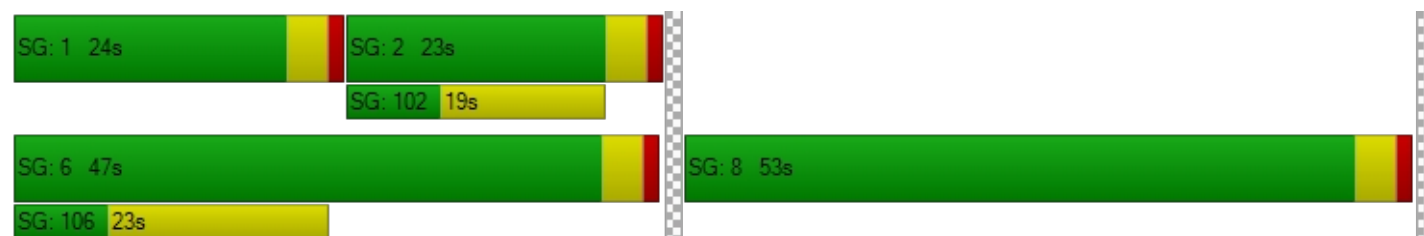
d_M, Delay for Movement [s/veh]	0.00	17.09	18.06	45.35	7.31	0.00	41.86	39.97	29.89	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	17.26			18.80			40.01			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.32											
Intersection LOS	C											
Intersection V/C	0.629											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.209			2.233		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.229			2.693			2.230			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.145

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	80	524	101	18	692
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	80	524	101	18	692
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	20	131	25	5	173
Total Analysis Volume [veh/h]	0	80	524	101	18	692
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.14	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	0.00	12.60	0.00	0.00	8.84	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.50	0.00	0.00	0.06	0.00
95th-Percentile Queue Length [ft/ln]	0.00	12.57	0.00	0.00	1.44	0.00
d_A, Approach Delay [s/veh]	12.60		0.00		0.22	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.83					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	16.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.555

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	928	226	81	598	0	47	0	55	287	0	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	928	226	81	598	0	47	0	55	287	0	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	232	57	20	150	0	12	0	14	72	0	19
Total Analysis Volume [veh/h]	0	928	226	81	598	0	47	0	55	287	0	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	73	73	82	82	20	20	20	20
g / C, Green / Cycle	0.66	0.66	0.75	0.75	0.18	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.30	0.32	0.05	0.16	0.03	0.03	0.16	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1256	1190	1143	2843	356	355	310	323
d1, Uniform Delay [s]	9.08	9.31	3.65	4.14	38.04	38.21	44.07	38.63
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.21	1.42	0.03	0.17	0.17	0.20	11.68	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.46	0.49	0.07	0.21	0.13	0.15	0.93	0.23
d, Delay for Lane Group [s/veh]	10.29	10.72	3.68	4.31	38.20	38.41	55.75	38.99
Lane Group LOS	B	B	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.61	6.81	0.42	1.77	1.09	1.28	8.58	1.74
50th-Percentile Queue Length [ft/ln]	165.21	170.18	10.41	44.37	27.18	31.97	214.55	43.62
95th-Percentile Queue Length [veh/ln]	10.82	11.09	0.75	3.19	1.96	2.30	13.39	3.14
95th-Percentile Queue Length [ft/ln]	270.61	277.15	18.75	79.87	48.93	57.54	334.67	78.51

**Movement, Approach, & Intersection Results**

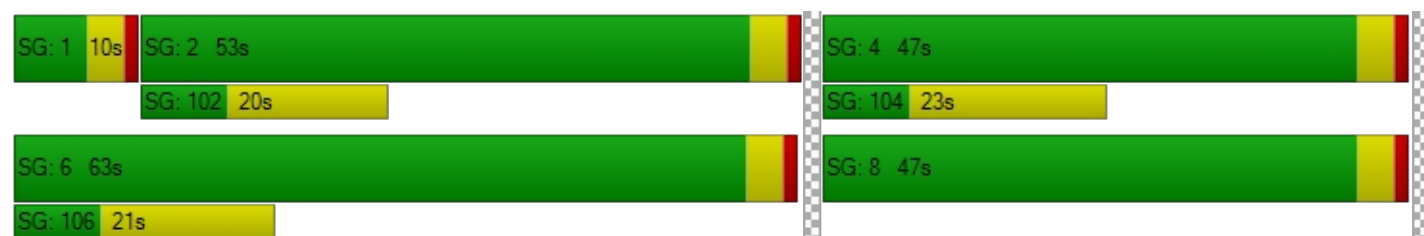
d_M, Delay for Movement [s/veh]	0.00	10.46	10.72	3.68	4.31	0.00	38.20	38.41	38.41	55.75	0.00	38.99
Movement LOS		B	B	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	10.51			4.24			38.32			52.32		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	16.46											
Intersection LOS	B											
Intersection V/C	0.555											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.713			1.774			2.245		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.512			2.120			1.728			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.134

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	49	455	355	7	64	79
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	455	355	7	64	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	114	89	2	16	20
Total Analysis Volume [veh/h]	49	455	355	7	64	79
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.13	0.12
d_M, Delay for Movement [s/veh]	8.14	0.00	0.00	0.00	14.64	12.33
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.13	0.00	0.00	0.00	0.98	0.98
95th-Percentile Queue Length [ft/ln]	3.20	0.00	0.00	0.00	24.50	24.50
d_A, Approach Delay [s/veh]	0.79		0.00		13.36	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.29					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	15.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	78	497	439	1	7	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	497	439	1	7	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	124	110	0	2	29
Total Analysis Volume [veh/h]	78	497	439	1	7	115
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.02	0.19
d_M, Delay for Movement [s/veh]	8.46	0.00	0.00	0.00	15.29	12.35
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.22	0.00	0.00	0.00	0.76	0.76
95th-Percentile Queue Length [ft/ln]	5.60	0.00	0.00	0.00	18.90	18.90
d_A, Approach Delay [s/veh]	1.15		0.00		12.52	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.92					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	16.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.079

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	564	28	43	569	31	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	564	28	43	569	31	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	141	7	11	142	8	16
Total Analysis Volume [veh/h]	564	28	43	569	31	62
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.08	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	8.83	0.00	16.15	13.90
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.14	0.00	0.74	0.74
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.42	0.00	18.42	18.42
d_A, Approach Delay [s/veh]	0.00		0.62		14.65	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.34					
Intersection LOS	C					



**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	17.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.477

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	33	856	77	0	684	11	0	0	28	0	0	259
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	856	77	0	684	11	0	0	28	0	0	259
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	214	19	0	171	3	0	0	7	0	0	65
Total Analysis Volume [veh/h]	33	856	77	0	684	11	0	0	28	0	0	259
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.48
d_M, Delay for Movement [s/veh]	9.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.80	0.00	0.00	17.53
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	2.55
95th-Percentile Queue Length [ft/ln]	2.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	0.00	0.00	63.84
d_A, Approach Delay [s/veh]	0.31			0.00			10.80			17.53		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	2.64											
Intersection LOS	C											





*APPENDIX F-V*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.476

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	96	551	106	231	633	172	164	612	96	119	824	232
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	551	106	231	633	172	164	612	96	119	824	232
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	138	27	58	158	43	41	153	24	30	206	58
Total Analysis Volume [veh/h]	96	551	106	231	633	172	164	612	96	119	824	232
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	42	0	12	43	0	14	43	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	56	56	8	58	58	10	18	18	13	20	20
g / C, Green / Cycle	0.05	0.50	0.50	0.07	0.53	0.53	0.09	0.16	0.16	0.12	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.03	0.10	0.06	0.07	0.14	0.14	0.09	0.12	0.13	0.03	0.14	0.13
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	184	2873	907	257	1995	945	165	606	287	412	1059	334
d1, Uniform Delay [s]	50.81	15.00	14.39	50.60	14.51	14.51	49.99	44.43	44.72	44.35	42.67	41.90
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.29	0.15	0.26	10.84	0.34	0.72	31.49	2.24	5.65	0.38	1.27	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.19	0.12	0.90	0.27	0.27	1.00	0.78	0.82	0.29	0.78	0.69
d, Delay for Lane Group [s/veh]	53.10	15.14	14.66	61.44	14.85	15.23	81.48	46.67	50.37	44.74	43.94	44.49
Lane Group LOS	D	B	B	E	B	B	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.35	2.53	1.45	3.53	3.80	3.70	5.93	6.36	6.60	1.51	7.19	6.10
50th-Percentile Queue Length [ft/ln]	33.66	63.28	36.16	88.36	94.91	92.53	148.34	159.00	165.08	37.65	179.82	152.58
95th-Percentile Queue Length [veh/ln]	2.42	4.56	2.60	6.36	6.83	6.66	9.93	10.50	10.82	2.71	11.59	10.15
95th-Percentile Queue Length [ft/ln]	60.58	113.91	65.09	159.05	170.85	166.56	248.21	262.40	270.43	67.76	289.78	253.87

**Movement, Approach, & Intersection Results**

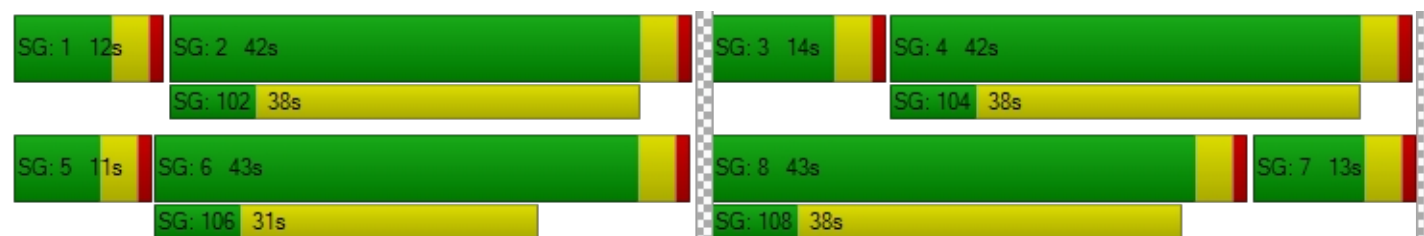
d_M, Delay for Movement [s/veh]	53.10	15.14	14.66	61.44	14.90	15.23	81.48	47.51	50.37	44.74	43.94	44.49
Movement LOS	D	B	B	E	B	B	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	19.91			25.34			54.21			44.13		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	36.59											
Intersection LOS	D											
Intersection V/C	0.476											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.032			2.977			2.877			3.089		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			709			691		
d_b, Bicycle Delay [s]	23.56			22.91			22.91			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.974			2.129			2.039			2.206		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	19	850	562	78	950	31	64	123	27	531	84	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	850	562	78	950	31	64	123	27	531	84	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	213	141	20	238	8	16	31	7	133	21	0
Total Analysis Volume [veh/h]	19	850	562	78	950	31	64	123	27	531	84	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	57	6	60	60	9	9	9	22	22
g / C, Green / Cycle	0.02	0.51	0.06	0.55	0.55	0.09	0.09	0.09	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.04	0.21	0.11	0.04	0.06	0.02	0.17	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	45	2925	102	2069	980	155	164	155	358	358
d1, Uniform Delay [s]	52.88	15.33	51.23	14.41	12.78	47.66	49.14	46.66	42.57	42.68
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.11	0.25	11.43	0.54	0.44	1.74	6.73	0.53	5.85	6.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.29	0.77	0.38	0.20	0.41	0.75	0.17	0.85	0.86
d, Delay for Lane Group [s/veh]	59.00	15.58	62.67	14.95	13.22	49.40	55.88	47.19	48.42	48.97
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.59	4.05	2.44	5.64	2.48	1.74	3.60	0.71	8.54	8.70
50th-Percentile Queue Length [ft/ln]	14.85	101.32	61.01	140.97	61.95	43.45	90.05	17.74	213.48	217.53
95th-Percentile Queue Length [veh/ln]	1.07	7.30	4.39	9.53	4.46	3.13	6.48	1.28	13.33	13.54
95th-Percentile Queue Length [ft/ln]	26.73	182.38	109.81	238.33	111.52	78.22	162.09	31.93	333.29	338.47

**Movement, Approach, & Intersection Results**

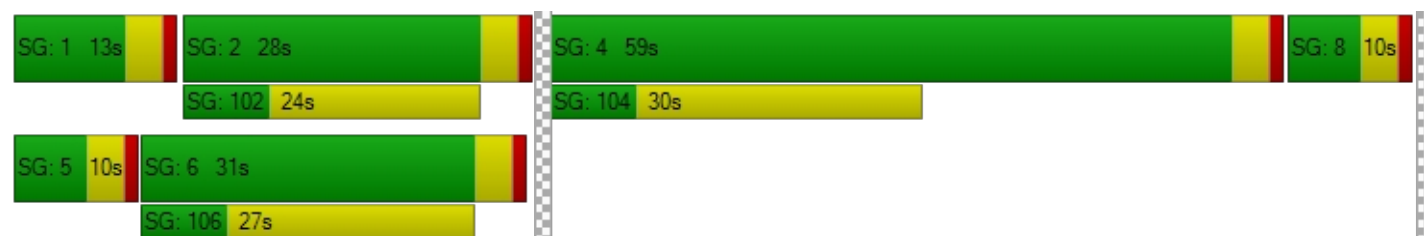
d_M, Delay for Movement [s/veh]	59.00	15.58	0.00	62.67	14.66	13.22	49.40	55.88	47.19	48.65	48.97	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	16.53			18.15			52.84			48.69		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.15											
Intersection LOS	C											
Intersection V/C	0.532											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.878			2.225			2.215		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.038			2.142			1.913			2.574		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.616

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	83	1117	44	268	1217	27	30	92	109	84	114	320
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	1117	44	268	1217	27	30	92	109	84	114	320
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	279	11	67	304	7	8	23	27	21	29	80
Total Analysis Volume [veh/h]	83	1117	44	268	1217	27	30	92	109	84	114	320
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	26	58	0	15	47	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	7	67	67	11	72	72	19	19	19	19	19	34
g / C, Green / Cycle	0.06	0.61	0.61	0.10	0.65	0.65	0.18	0.18	0.18	0.18	0.18	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.32	0.31	0.08	0.32	0.02	0.02	0.05	0.06	0.05	0.06	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	109	1166	1104	355	2486	1178	255	334	317	275	334	565
d1, Uniform Delay [s]	50.85	12.00	11.93	48.07	9.66	6.67	37.97	39.23	39.74	39.16	39.72	31.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.19
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.30	1.62	1.67	3.28	0.69	0.04	0.20	0.44	0.64	0.62	0.60	1.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.51	0.51	0.76	0.49	0.02	0.12	0.28	0.34	0.31	0.34	0.57
d, Delay for Lane Group [s/veh]	61.15	13.62	13.60	51.35	10.36	6.70	38.17	39.68	40.39	39.79	40.32	33.11
Lane Group LOS	E	B	B	D	B	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.56	8.34	7.78	3.73	7.11	0.22	0.69	2.19	2.64	2.01	2.76	7.29
50th-Percentile Queue Length [ft/ln]	63.99	208.52	194.51	93.24	177.70	5.55	17.35	54.86	66.02	50.25	68.93	182.30
95th-Percentile Queue Length [veh/ln]	4.61	13.08	12.35	6.71	11.48	0.40	1.25	3.95	4.75	3.62	4.96	11.72
95th-Percentile Queue Length [ft/ln]	115.19	326.93	308.87	167.83	287.01	9.99	31.23	98.75	118.84	90.45	124.07	293.01

**Movement, Approach, & Intersection Results**

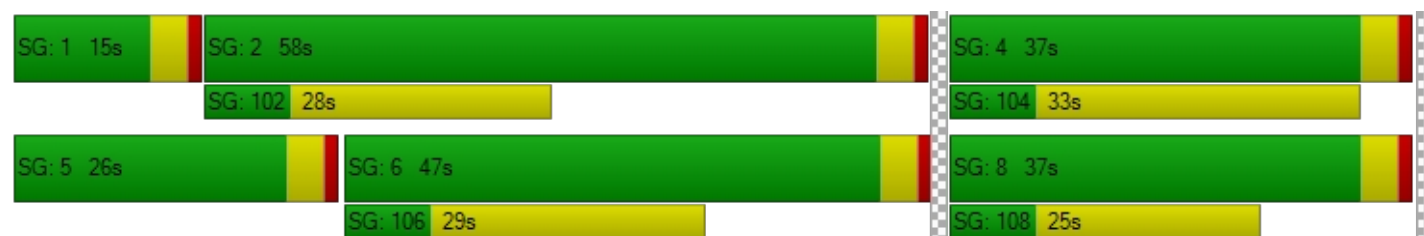
d_M, Delay for Movement [s/veh]	61.15	13.61	13.60	51.35	10.36	6.70	38.17	39.68	40.39	39.79	40.32	33.11
Movement LOS	E	B	B	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	16.78			17.56			39.82			35.78		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.44											
Intersection LOS	C											
Intersection V/C	0.616											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.946			3.061			2.252			2.489		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			782			600			600		
d_b, Bicycle Delay [s]	14.25			20.40			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.586			2.807			1.941			2.414		
Bicycle LOS	B			C			A			B		

**Sequence**



Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.476

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	232	264	148	89	183	21	16	312	133	101	295	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	232	264	148	89	183	21	16	312	133	101	295	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	66	37	22	46	5	4	78	33	25	74	35
Total Analysis Volume [veh/h]	232	264	148	89	183	21	16	312	133	101	295	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	30	0	0	49	49	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	39	39	20	20	63	20	20	20
g / C, Green / Cycle	0.35	0.35	0.35	0.35	0.35	0.19	0.19	0.57	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.13	0.15	0.08	0.05	0.11	0.01	0.16	0.07	0.06	0.12	0.11
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	634	634	634	634	634	184	353	1034	102	353	334
d1, Uniform Delay [s]	26.41	26.96	25.07	24.21	25.95	36.71	43.53	10.72	38.55	41.45	40.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.16	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	2.01	0.86	0.46	1.34	0.20	10.26	0.26	39.20	2.10	1.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.42	0.23	0.14	0.32	0.09	0.88	0.13	0.99	0.66	0.60
d, Delay for Lane Group [s/veh]	28.04	28.97	25.93	24.67	27.29	36.91	53.79	10.98	77.75	43.55	42.68
Lane Group LOS	C	C	C	C	C	D	D	B	E	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.78	5.57	2.87	1.66	4.12	0.36	9.21	1.52	3.46	6.02	5.12
50th-Percentile Queue Length [ft/ln]	119.53	139.37	71.83	41.54	102.97	9.12	230.16	38.10	86.52	150.50	128.07
95th-Percentile Queue Length [veh/ln]	8.37	9.45	5.17	2.99	7.41	0.66	14.18	2.74	6.23	10.04	8.83
95th-Percentile Queue Length [ft/ln]	209.18	236.18	129.30	74.77	185.35	16.42	354.57	68.58	155.74	251.10	220.87

**Movement, Approach, & Intersection Results**

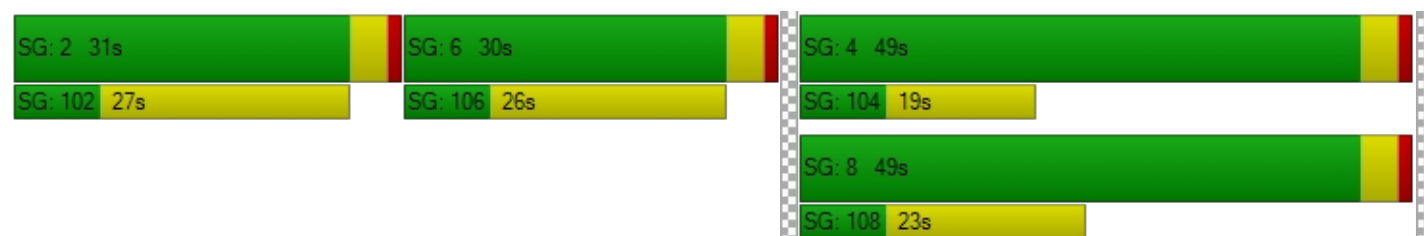
d_M, Delay for Movement [s/veh]	28.04	28.97	25.93	24.67	27.29	27.29	36.91	53.79	10.98	77.75	43.37	42.68
Movement LOS	C	C	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	27.94			26.49			40.86			49.69		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.81											
Intersection LOS	D											
Intersection V/C	0.476											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.543			2.204			2.506			2.405		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			818			818		
d_b, Bicycle Delay [s]	31.31			32.07			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.622			2.043			2.320			2.000		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.322

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	15	143	79	309	417	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	143	79	309	417	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	36	20	77	104	7
Total Analysis Volume [veh/h]	15	143	79	309	417	28
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.04	0.16	0.22	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	178	178	1422	1574	1574	1491
d1, Uniform Delay [s]	44.99	48.46	1.69	1.93	2.07	1.64
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	8.25	0.07	0.28	0.41	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.80	0.06	0.20	0.26	0.02
d, Delay for Lane Group [s/veh]	45.19	56.71	1.76	2.21	2.48	1.66
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.38	4.23	0.22	0.99	1.44	0.08
50th-Percentile Queue Length [ft/ln]	9.56	105.84	5.60	24.78	35.96	1.91
95th-Percentile Queue Length [veh/ln]	0.69	7.61	0.40	1.78	2.59	0.14
95th-Percentile Queue Length [ft/ln]	17.21	190.20	10.08	44.60	64.72	3.44

**Movement, Approach, & Intersection Results**

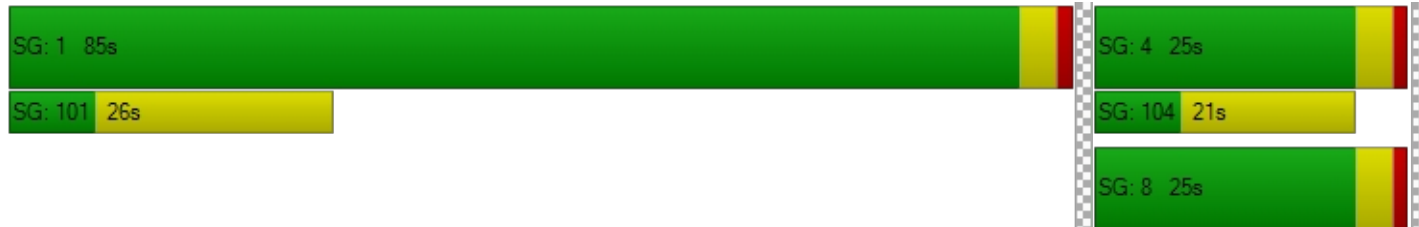
d_M, Delay for Movement [s/veh]	45.19	56.71	1.76	2.21	2.48	1.66
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.62		2.12		2.43	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	10.79					
Intersection LOS	B					
Intersection V/C	0.322					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.148	2.258	2.200
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.773	4.867
Bicycle LOS	D	E	E

**Sequence**





Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	14.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.469

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	58	1043	83	80	980	47	67	128	72	47	58	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	1043	83	80	980	47	67	128	72	47	58	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	261	21	20	245	12	17	32	18	12	15	9
Total Analysis Volume [veh/h]	58	1043	83	80	980	47	67	128	72	47	58	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	12	59	0	11	30	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	85	75	75	85	76	76	17	9	9	17	8	8
g / C, Green / Cycle	0.77	0.68	0.68	0.77	0.69	0.69	0.16	0.08	0.08	0.16	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.30	0.04	0.28	0.28	0.04	0.06	0.05	0.03	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1245	1298	1230	1208	1307	1238	340	149	141	287	137	130
d1, Uniform Delay [s]	3.00	7.98	7.89	3.04	7.45	7.41	40.63	49.54	49.37	40.17	48.65	48.60
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	1.13	1.14	0.02	0.94	0.97	0.28	6.19	5.41	0.26	1.60	1.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.45	0.44	0.07	0.41	0.40	0.20	0.71	0.67	0.16	0.36	0.35
d, Delay for Lane Group [s/veh]	3.07	9.12	9.04	3.06	8.39	8.37	40.91	55.73	54.77	40.43	50.25	50.19
Lane Group LOS	A	A	A	A	A	A	D	E	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.27	6.13	5.62	0.35	5.23	4.86	1.62	3.09	2.73	1.13	1.36	1.24
50th-Percentile Queue Length [ft/ln]	6.78	153.27	140.41	8.81	130.79	121.54	40.52	77.26	68.17	28.17	34.03	31.05
95th-Percentile Queue Length [veh/ln]	0.49	10.19	9.50	0.63	8.98	8.48	2.92	5.56	4.91	2.03	2.45	2.24
95th-Percentile Queue Length [ft/ln]	12.20	254.79	237.58	15.85	224.57	211.95	72.93	139.06	122.71	50.70	61.26	55.89

**Movement, Approach, & Intersection Results**

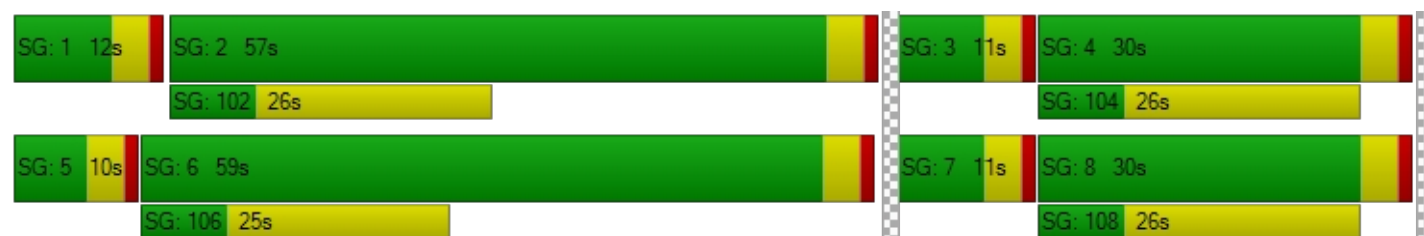
d_M, Delay for Movement [s/veh]	3.07	9.08	9.04	3.06	8.38	8.37	40.91	55.56	54.77	40.43	50.24	50.19
Movement LOS	A	A	A	A	A	A	D	E	D	D	D	D
d_A, Approach Delay [s/veh]	8.78			8.00			51.67			46.98		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	14.71											
Intersection LOS	B											
Intersection V/C	0.469											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.761			2.758			2.452			2.474		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			1000			473			473		
d_b, Bicycle Delay [s]	14.77			13.75			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.536			2.473			1.780			1.677		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 7: Harbor Boulevard at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	118	951	256	126	804	159	166	643	120	212	539	125
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	951	256	126	804	159	166	643	120	212	539	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	238	64	32	201	40	42	161	30	53	135	31
Total Analysis Volume [veh/h]	118	951	256	126	804	159	166	643	120	212	539	125
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	10	59	0	10	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	65	55	55	65	55	55	37	27	27	37	27	27
g / C, Green / Cycle	0.59	0.50	0.50	0.59	0.50	0.50	0.33	0.24	0.24	0.33	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.32	0.07	0.27	0.25	0.09	0.21	0.20	0.12	0.14	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	820	953	903	690	954	904	478	462	438	337	925	438
d1, Uniform Delay [s]	9.79	20.61	19.95	9.84	18.64	18.26	26.82	39.99	39.41	27.59	36.73	33.87
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.37	3.76	3.30	0.13	2.13	2.00	0.43	5.21	3.92	1.93	0.59	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.67	0.63	0.18	0.53	0.50	0.35	0.87	0.82	0.63	0.58	0.29
d, Delay for Lane Group [s/veh]	10.16	24.37	23.25	9.96	20.77	20.25	27.25	45.20	43.33	29.52	37.31	34.22
Lane Group LOS	B	C	C	A	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.29	12.88	11.02	1.32	9.12	7.98	3.25	11.02	9.60	4.38	6.44	2.76
50th-Percentile Queue Length [ft/ln]	32.28	322.03	275.57	32.98	227.88	199.47	81.27	275.43	240.06	109.43	160.90	69.09
95th-Percentile Queue Length [veh/ln]	2.32	18.77	16.47	2.37	14.07	12.61	5.85	16.46	14.68	7.81	10.60	4.97
95th-Percentile Queue Length [ft/ln]	58.10	469.19	411.69	59.37	351.67	315.28	146.29	411.52	367.11	195.20	264.91	124.37

**Movement, Approach, & Intersection Results**

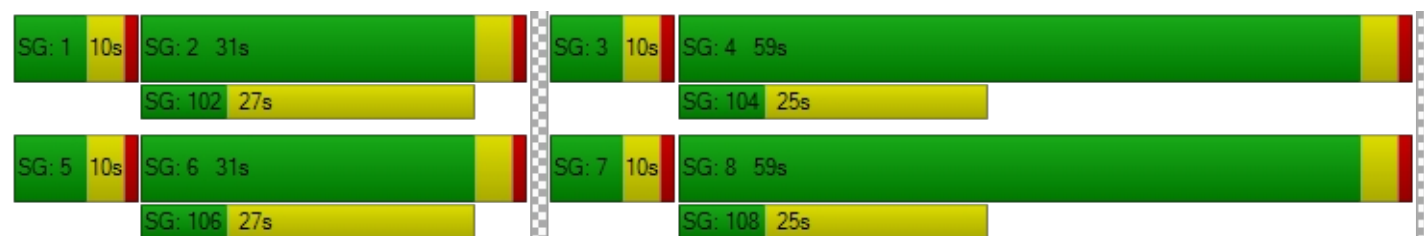
d_M, Delay for Movement [s/veh]	10.16	24.00	23.25	9.96	20.58	20.25	27.25	44.50	43.33	29.52	37.31	34.22
Movement LOS	B	C	C	A	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	22.62			19.31			41.27			34.99		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	28.44											
Intersection LOS	C											
Intersection V/C	0.783											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.868			2.826			2.737			2.865		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			1000		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.653			2.458			2.326			2.282		
Bicycle LOS	B			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	120	408	225	45	409	118	303	657	120	151	626	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	408	225	45	409	118	303	657	120	151	626	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	102	56	11	102	30	76	164	30	38	157	29
Total Analysis Volume [veh/h]	120	408	225	45	409	118	303	657	120	151	626	114
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	41	58	0	10	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	47	47	56	46	46	21	36	36	6	21	21
g / C, Green / Cycle	0.51	0.43	0.43	0.51	0.42	0.42	0.19	0.33	0.33	0.05	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.13	0.03	0.15	0.14	0.17	0.22	0.20	0.04	0.16	0.06
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	822	1634	774	880	794	752	340	622	590	194	737	349
d1, Uniform Delay [s]	14.27	20.04	20.44	13.66	21.89	21.64	43.54	31.73	31.27	51.34	42.82	38.18
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.37	0.37	0.95	0.02	1.23	1.17	8.02	1.19	1.08	6.65	2.85	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.25	0.29	0.05	0.35	0.33	0.89	0.66	0.62	0.78	0.85	0.33
d, Delay for Lane Group [s/veh]	14.65	20.40	21.39	13.69	23.12	22.81	51.56	32.93	32.35	57.99	45.67	38.72
Lane Group LOS	B	C	C	B	C	C	D	C	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.65	3.40	3.94	0.57	5.15	4.52	8.74	9.44	8.33	2.23	8.45	2.70
50th-Percentile Queue Length [ft/ln]	41.15	84.99	98.39	14.15	128.74	112.92	218.58	236.00	208.32	55.77	211.18	67.53
95th-Percentile Queue Length [veh/ln]	2.96	6.12	7.08	1.02	8.87	8.00	13.59	14.48	13.07	4.02	13.21	4.86
95th-Percentile Queue Length [ft/ln]	74.08	152.98	177.11	25.47	221.79	200.06	339.81	361.97	326.67	100.39	330.35	121.55

**Movement, Approach, & Intersection Results**

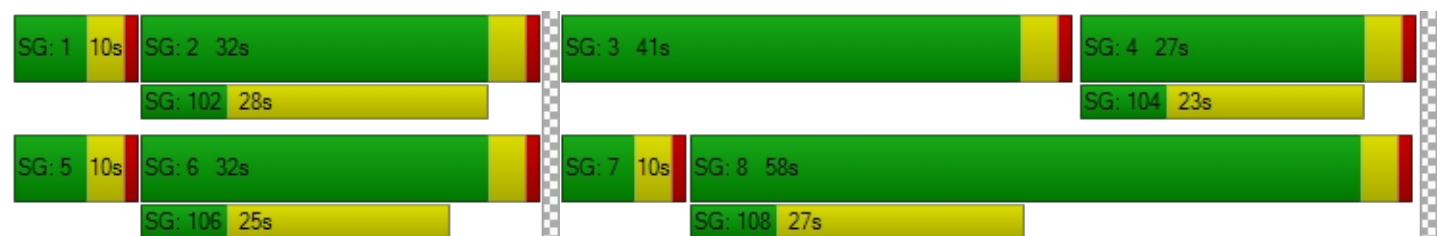
d_M, Delay for Movement [s/veh]	14.65	20.40	21.39	13.69	23.02	22.81	51.56	32.71	32.35	57.99	45.67	38.72
Movement LOS	B	C	C	B	C	C	D	C	C	E	D	D
d_A, Approach Delay [s/veh]	19.78			22.24			37.96			46.87		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	33.49											
Intersection LOS	C											
Intersection V/C	0.606											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.695			2.582			2.763			2.885		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			418		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			34.40		
I_b,int, Bicycle LOS Score for Intersection	2.181			2.032			2.451			2.295		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.481

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	22	13	263	19	92	269	674	7	7	810	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	22	13	263	19	92	269	674	7	7	810	617
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	3	66	5	23	67	169	2	2	203	154
Total Analysis Volume [veh/h]	12	22	13	263	19	92	269	674	7	7	810	617
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	18	27	75	75	75	62	62	85
g / C, Green / Cycle	0.04	0.04	0.04	0.17	0.24	0.68	0.68	0.68	0.57	0.57	0.77
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.08	0.06	0.15	0.18	0.18	0.00	0.21	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	79	75	581	439	1111	1298	1230	919	2154	1384
d1, Uniform Delay [s]	50.86	51.11	50.89	41.37	33.51	6.48	6.76	6.75	10.36	13.11	4.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.33	1.89	1.09	0.55	0.30	0.11	0.51	0.54	0.02	0.50	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.28	0.17	0.45	0.25	0.24	0.27	0.27	0.01	0.38	0.45
d, Delay for Lane Group [s/veh]	52.19	53.00	51.98	41.93	33.81	6.59	7.27	7.29	10.37	13.62	4.97
Lane Group LOS	D	D	D	D	C	A	A	A	B	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.34	0.63	0.37	3.26	2.43	2.18	3.09	2.93	0.08	5.46	4.10
50th-Percentile Queue Length [ft/ln]	8.58	15.73	9.21	81.51	60.76	54.42	77.35	73.19	1.91	136.62	102.53
95th-Percentile Queue Length [veh/ln]	0.62	1.13	0.66	5.87	4.37	3.92	5.57	5.27	0.14	9.30	7.38
95th-Percentile Queue Length [ft/ln]	15.44	28.31	16.58	146.72	109.37	97.96	139.23	131.74	3.44	232.47	184.56

**Movement, Approach, & Intersection Results**

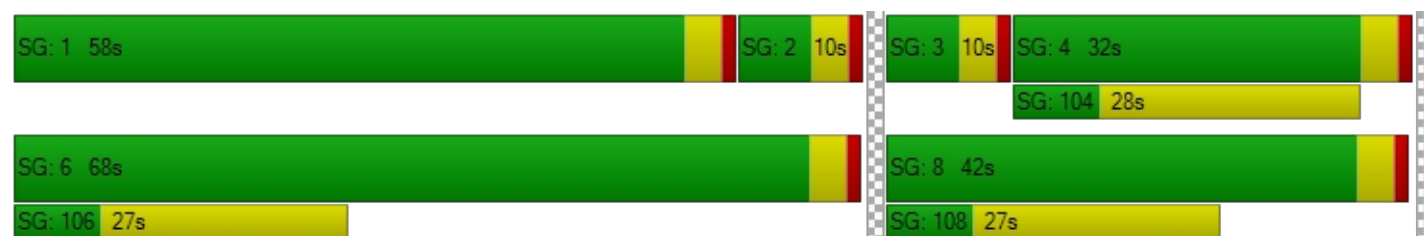
d_M, Delay for Movement [s/veh]	52.19	53.00	51.98	41.93	33.81	33.81	6.59	7.28	7.29	10.37	13.62	4.97
Movement LOS	D	D	D	D	C	C	A	A	A	B	B	A
d_A, Approach Delay [s/veh]	52.51			39.52			7.09			9.88		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	13.60											
Intersection LOS	B											
Intersection V/C	0.481											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.170			2.677			2.690			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.637			2.177			2.343			2.743		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	198	110	95	120	176	72	53	786	96	96	1228	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	198	110	95	120	176	72	53	786	96	96	1228	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	28	24	30	44	18	13	197	24	24	307	13
Total Analysis Volume [veh/h]	198	110	95	120	176	72	53	786	96	96	1228	52
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	33	0	38	61	0	11	29	0	10	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	22	9	9	22	12	12	80	71	71	80	72	72
g / C, Green / Cycle	0.20	0.08	0.08	0.20	0.10	0.10	0.73	0.64	0.64	0.73	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.11	0.06	0.05	0.07	0.07	0.06	0.03	0.24	0.23	0.05	0.35	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	336	159	151	356	199	189	1053	1220	1156	1188	1235	1170
d1, Uniform Delay [s]	39.94	49.05	48.78	38.09	47.40	47.18	4.11	9.32	9.20	4.21	10.35	10.28
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.65	5.26	4.27	0.56	3.70	3.28	0.02	0.90	0.89	0.13	1.67	1.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.69	0.63	0.34	0.66	0.62	0.05	0.38	0.36	0.08	0.54	0.53
d, Delay for Lane Group [s/veh]	41.59	54.31	53.06	38.64	51.10	50.46	4.13	10.21	10.09	4.34	12.02	12.00
Lane Group LOS	D	D	D	D	D	D	A	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.98	3.17	2.70	2.84	3.66	3.23	0.30	5.20	4.69	0.58	8.47	7.90
50th-Percentile Queue Length [ft/ln]	124.53	79.18	67.50	71.12	91.50	80.66	7.41	129.98	117.22	14.60	211.78	197.55
95th-Percentile Queue Length [veh/ln]	8.64	5.70	4.86	5.12	6.59	5.81	0.53	8.94	8.24	1.05	13.24	12.51
95th-Percentile Queue Length [ft/ln]	216.03	142.52	121.50	128.01	164.71	145.19	13.35	223.47	206.01	26.28	331.11	312.81

**Movement, Approach, & Intersection Results**

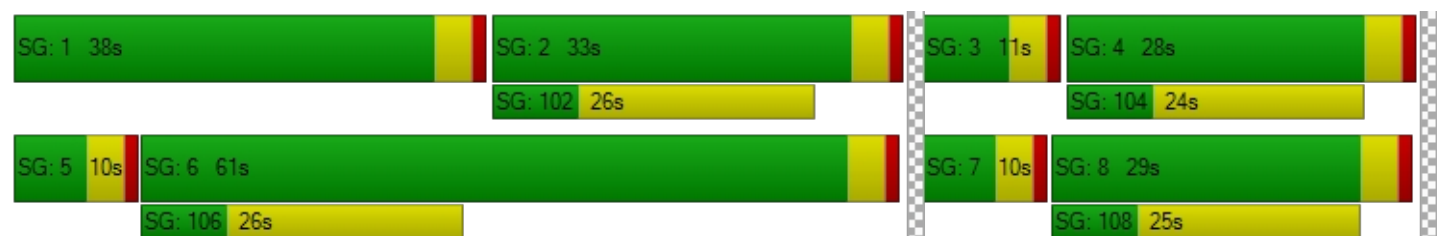
d_M, Delay for Movement [s/veh]	41.59	54.31	53.06	38.64	50.94	50.46	4.13	10.16	10.09	4.34	12.01	12.00
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	47.76			46.83			9.81			11.47		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	19.94											
Intersection LOS	B											
Intersection V/C	0.607											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.550			2.333			2.831			2.790		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			1036			455			436		
d_b, Bicycle Delay [s]	29.82			12.77			32.84			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.225			1.863			2.331			2.695		
Bicycle LOS	B			A			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.445

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	39	41	51	29	22	33	26	883	42	49	1288	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	41	51	29	22	33	26	883	42	49	1288	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	10	13	7	6	8	7	221	11	12	322	12
Total Analysis Volume [veh/h]	39	41	51	29	22	33	26	883	42	49	1288	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	69	0	10	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	87	87	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.87	0.79	0.79	0.87	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.03	0.02	0.03	0.01	0.25	0.25	0.03	0.36	0.36
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	80	103	97	96	97	1457	1509	1430	1534	1532	1452
d1, Uniform Delay [s]	50.31	50.30	50.65	50.02	50.77	0.90	3.11	3.10	0.91	3.23	3.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.57	2.50	4.33	1.76	5.09	0.00	0.55	0.57	0.04	0.96	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.49	0.40	0.52	0.30	0.57	0.02	0.32	0.31	0.03	0.45	0.45
d, Delay for Lane Group [s/veh]	54.88	52.80	54.98	51.78	55.86	0.90	3.67	3.67	0.95	4.19	4.20
Lane Group LOS	D	D	D	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.14	1.16	1.48	0.81	1.61	0.03	2.40	2.24	0.07	3.67	3.44
50th-Percentile Queue Length [ft/ln]	28.47	29.05	37.08	20.35	40.35	0.70	60.08	55.96	1.65	91.71	85.94
95th-Percentile Queue Length [veh/ln]	2.05	2.09	2.67	1.46	2.91	0.05	4.33	4.03	0.12	6.60	6.19
95th-Percentile Queue Length [ft/ln]	51.25	52.29	66.74	36.62	72.63	1.25	108.14	100.74	2.97	165.08	154.69

**Movement, Approach, & Intersection Results**

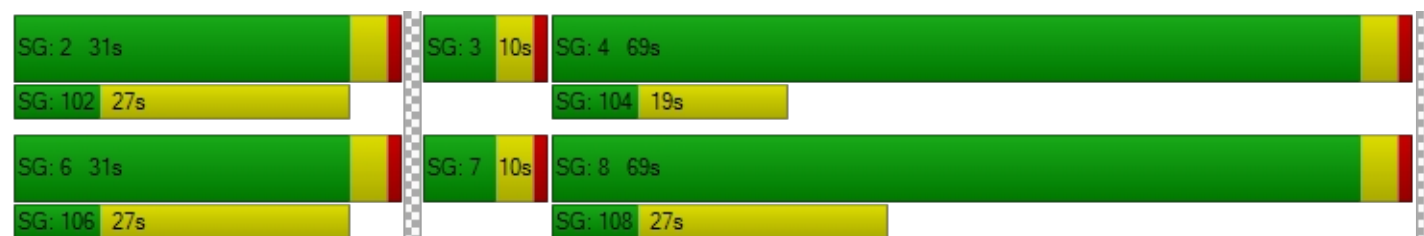
d_M, Delay for Movement [s/veh]	54.88	52.80	54.98	51.78	55.86	55.86	0.90	3.67	3.67	0.95	4.19	4.20
Movement LOS	D	D	D	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.27			54.45			3.59			4.08		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.13											
Intersection LOS	A											
Intersection V/C	0.445											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.257			2.045			2.816			2.809		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1182			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.20			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.776			1.698			2.344			2.702		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	136	259	86	148	300	277	238	734	77	138	965	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	136	259	86	148	300	277	238	734	77	138	965	130
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	65	22	37	75	69	60	184	19	35	241	33
Total Analysis Volume [veh/h]	136	259	86	148	300	277	238	734	77	138	965	130
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	34	0	17	37	37	13	35	0	24	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	47	47	7	43	56	9	24	24	17	32	32
g / C, Green / Cycle	0.09	0.42	0.42	0.06	0.39	0.51	0.08	0.22	0.22	0.15	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.08	0.07	0.05	0.04	0.08	0.15	0.07	0.19	0.04	0.08	0.25	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	165	1608	761	215	1493	921	289	836	396	270	1093	518
d1, Uniform Delay [s]	49.15	19.67	19.25	50.64	22.03	15.51	49.72	41.51	34.99	43.05	37.43	30.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.13	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.91	0.21	0.30	3.90	0.30	0.22	5.88	3.16	0.24	1.49	2.55	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.16	0.11	0.69	0.20	0.30	0.82	0.88	0.19	0.51	0.88	0.25
d, Delay for Lane Group [s/veh]	59.06	19.88	19.55	54.54	22.33	15.73	55.61	44.67	35.23	44.54	39.98	30.35
Lane Group LOS	E	B	B	D	C	B	E	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.12	2.09	1.39	2.11	2.61	3.99	3.45	9.91	1.71	3.56	12.61	2.68
50th-Percentile Queue Length [ft/ln]	102.91	52.37	34.85	52.78	65.30	99.87	86.26	247.63	42.82	89.10	315.14	67.08
95th-Percentile Queue Length [veh/ln]	7.41	3.77	2.51	3.80	4.70	7.19	6.21	15.07	3.08	6.42	18.43	4.83
95th-Percentile Queue Length [ft/ln]	185.23	94.27	62.73	95.01	117.54	179.77	155.26	376.66	77.07	160.38	460.71	120.75

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.06	19.88	19.55	54.54	22.33	15.73	55.61	44.67	35.23	44.54	39.98	30.35
Movement LOS	E	B	B	D	C	B	E	D	D	D	D	C
d_A, Approach Delay [s/veh]	30.90			26.38			46.46			39.48		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.67											
Intersection LOS	D											
Intersection V/C	0.627											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.624			2.792			2.942			2.820		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			564			764		
d_b, Bicycle Delay [s]	29.09			26.95			28.37			21.02		
I_b,int, Bicycle LOS Score for Intersection	1.956			2.158			2.425			2.577		
Bicycle LOS	A			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	20.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	61	0	180	121	99	323	0
Total Analysis Volume [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	19	0	68	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		17	17	55	55	27	85
g / C, Green / Cycle		0.15	0.15	0.50	0.50	0.24	0.78
(v / s)_i Volume / Saturation Flow Rate		0.05	0.13	0.19	0.27	0.22	0.34
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		274	274	1889	895	435	2945
d1, Uniform Delay [s]		41.68	45.66	17.14	19.00	40.58	4.21
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.73	9.17	0.58	2.33	7.83	0.48
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.34	0.88	0.38	0.54	0.91	0.44
d, Delay for Lane Group [s/veh]		42.41	54.84	17.72	21.33	48.41	4.69
Lane Group LOS		D	D	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.31	7.13	5.68	8.82	11.28	4.09
50th-Percentile Queue Length [ft/ln]		57.82	178.35	141.93	220.46	281.91	102.28
95th-Percentile Queue Length [veh/ln]		4.16	11.51	9.58	13.69	16.78	7.36
95th-Percentile Queue Length [ft/ln]		104.08	287.86	239.62	342.21	419.59	184.11

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	42.41	42.41	54.84	0.00	17.72	21.33	48.41	4.69	0.00
Movement LOS				D	D	D		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			51.39			19.18			14.97		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	20.32											
Intersection LOS	C											
Intersection V/C	0.700											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.291	1.888	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	273	1509
d_b, Bicycle Delay [s]	55.00	37.64	41.02	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.112	2.220	2.952
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	155	0	100	0	0	0	54	163	0	0	249	36
Total Analysis Volume [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	59	0	0	0	0	0	32	51	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25		15	77	58	58
g / C, Green / Cycle	0.22	0.22	0.22		0.14	0.70	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.12	0.17	0.30	0.32
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	404	404	404		250	2671	1003	950
d1, Uniform Delay [s]	40.78	40.78	40.78		46.28	5.86	17.52	17.95
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.80	4.80	4.80		8.24	0.22	2.34	2.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.84	0.84		0.86	0.24	0.57	0.60
d, Delay for Lane Group [s/veh]	45.59	45.59	45.59		54.53	6.08	19.86	20.75
Lane Group LOS	D	D	D		D	A	B	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.26	9.26	9.26		6.26	2.52	10.05	10.37
50th-Percentile Queue Length [ft/ln]	231.54	231.54	231.54		156.55	62.97	251.31	259.24
95th-Percentile Queue Length [veh/ln]	14.25	14.25	14.25		10.37	4.53	15.25	15.65
95th-Percentile Queue Length [ft/ln]	356.32	356.32	356.32		259.15	113.34	381.31	391.27

**Movement, Approach, & Intersection Results**

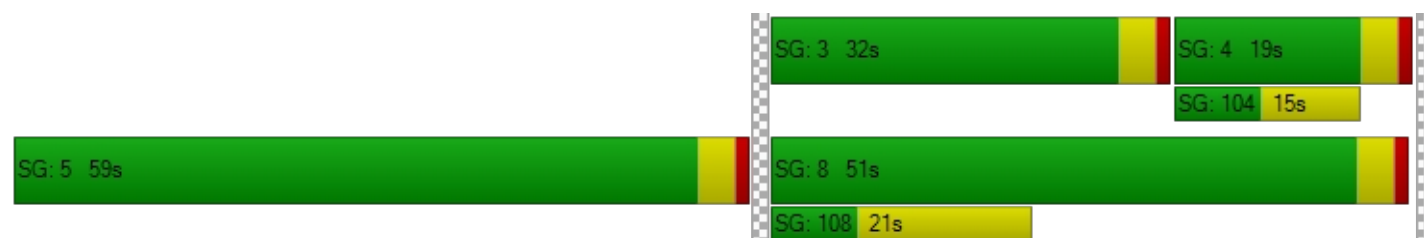
d_M, Delay for Movement [s/veh]	45.59	0.00	45.59	0.00	0.00	0.00	54.53	6.08	0.00	0.00	20.24	20.75
Movement LOS	D		D				D	A			C	C
d_A, Approach Delay [s/veh]	45.59			0.00			18.05			20.30		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	28.18											
Intersection LOS	C											
Intersection V/C	0.701											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.281	1.782	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	855	273
d_b, Bicycle Delay [s]	55.00	55.00	18.04	41.02
I_b,int, Bicycle LOS Score for Intersection	5.815	4.132	2.274	2.500
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.292

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	31	814	28	11	697	18	13	19	32	32	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	814	28	11	697	18	13	19	32	32	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	204	7	3	174	5	3	5	8	8	4	7
Total Analysis Volume [veh/h]	31	814	28	11	697	18	13	19	32	32	17	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	96	96	96	96	96	96	6	6
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.23	0.23	0.01	0.19	0.19	0.04	0.04
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1527	1656	1569	1513	1656	1569	139	146
d1, Uniform Delay [s]	0.92	1.17	1.17	0.91	1.12	1.12	50.80	51.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.39	0.40	0.01	0.31	0.32	2.35	2.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.26	0.26	0.01	0.22	0.22	0.46	0.52
d, Delay for Lane Group [s/veh]	0.94	1.56	1.57	0.92	1.43	1.44	53.16	53.99
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.04	0.76	0.71	0.02	0.61	0.58	1.81	2.18
50th-Percentile Queue Length [ft/ln]	1.07	18.90	17.86	0.38	15.30	14.53	45.35	54.38
95th-Percentile Queue Length [veh/ln]	0.08	1.36	1.29	0.03	1.10	1.05	3.26	3.92
95th-Percentile Queue Length [ft/ln]	1.92	34.03	32.15	0.68	27.55	26.15	81.62	97.88

**Movement, Approach, & Intersection Results**

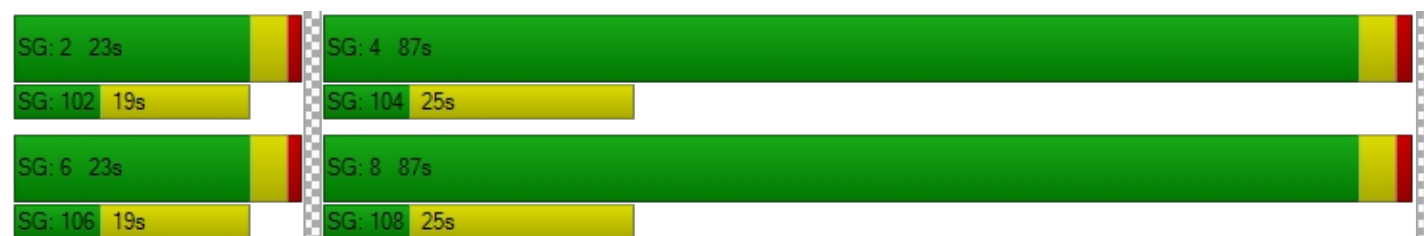
d_M, Delay for Movement [s/veh]	0.94	1.56	1.57	0.92	1.44	1.44	53.16	53.16	53.16	53.99	53.99	53.99
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.54			1.43			53.16			53.99		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.69											
Intersection LOS	A											
Intersection V/C	0.292											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.674			2.636			1.832			1.805		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.280			2.159			1.665			1.685		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	104	1191	112	108	916	192	191	437	94	134	451	199
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	1191	112	108	916	192	191	437	94	134	451	199
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	298	28	27	229	48	48	109	24	34	113	50
Total Analysis Volume [veh/h]	104	1191	112	108	916	192	191	437	94	134	451	199
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	57	0	10	53	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	37	37	37	53	42	42	53	40	40
g / C, Green / Cycle	0.36	0.36	0.36	0.34	0.34	0.34	0.48	0.38	0.38	0.48	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.06	0.31	0.06	0.06	0.31	0.29	0.11	0.12	0.05	0.07	0.12	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	262	1357	643	231	646	612	800	1445	685	809	1364	646
d1, Uniform Delay [s]	24.16	33.15	24.27	25.51	34.65	33.79	16.74	23.88	22.30	16.16	25.68	25.44
k, delay calibration	0.11	0.11	0.11	0.11	0.20	0.21	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.98	1.99	0.13	1.46	8.91	6.49	0.15	0.54	0.42	0.44	0.65	1.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.40	0.88	0.17	0.47	0.91	0.85	0.24	0.30	0.14	0.17	0.33	0.31
d, Delay for Lane Group [s/veh]	25.14	35.14	24.40	26.97	43.56	40.28	16.89	24.42	22.72	16.60	26.33	26.68
Lane Group LOS	C	D	C	C	D	D	B	C	C	B	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.92	14.93	2.03	2.08	16.23	13.85	2.82	4.07	1.67	1.99	4.39	3.96
50th-Percentile Queue Length [ft/ln]	48.07	373.17	50.66	52.04	405.74	346.15	70.49	101.63	41.73	49.66	109.82	98.88
95th-Percentile Queue Length [veh/ln]	3.46	21.26	3.65	3.75	22.84	19.95	5.08	7.32	3.00	3.58	7.83	7.12
95th-Percentile Queue Length [ft/ln]	86.53	531.58	91.19	93.66	570.92	498.71	126.88	182.94	75.11	89.40	195.76	177.98

**Movement, Approach, & Intersection Results**

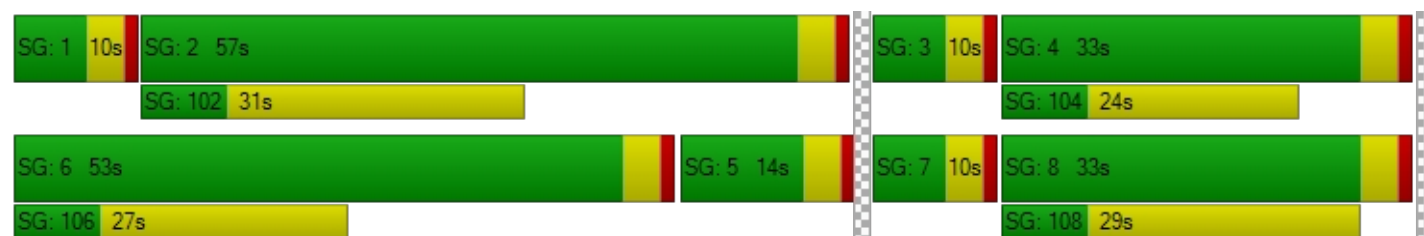
d_M, Delay for Movement [s/veh]	25.14	35.14	24.40	26.97	42.37	40.28	16.89	24.42	22.72	16.60	26.33	26.68
Movement LOS	C	D	C	C	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.55			40.68			22.21			24.75		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.99											
Intersection LOS	C											
Intersection V/C	0.634											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.953			2.958			2.795			2.738		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			891			527			527		
d_b, Bicycle Delay [s]	14.77			16.91			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.720			2.563			2.155			2.206		
Bicycle LOS	B			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	129	751	196	46	689	73	84	505	124	242	516	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	751	196	46	689	73	84	505	124	242	516	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	188	49	12	172	18	21	126	31	61	129	10
Total Analysis Volume [veh/h]	129	751	196	46	689	73	84	505	124	242	516	40
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	25	48	0	22	45	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	29	29	38	26	26	7	50	50	10	53	53
g / C, Green / Cycle	0.34	0.27	0.27	0.34	0.24	0.24	0.06	0.46	0.46	0.09	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.07	0.20	0.11	0.03	0.21	0.20	0.05	0.13	0.07	0.07	0.14	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	358	1011	479	393	453	429	111	1727	818	322	1843	873
d1, Uniform Delay [s]	25.47	36.96	33.27	24.27	40.39	40.04	50.87	18.90	17.60	48.75	16.89	14.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.61	1.10	0.56	0.13	5.61	4.76	10.18	0.43	0.39	3.53	0.38	0.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.74	0.41	0.12	0.88	0.85	0.76	0.29	0.15	0.75	0.28	0.05
d, Delay for Lane Group [s/veh]	26.09	38.06	33.84	24.40	46.00	44.80	61.05	19.33	17.99	52.28	17.27	15.03
Lane Group LOS	C	D	C	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.45	9.31	4.38	0.82	10.97	9.89	2.59	4.11	1.92	3.39	3.93	0.55
50th-Percentile Queue Length [ft/ln]	61.17	232.64	109.39	20.62	274.28	247.19	64.69	102.83	48.08	84.80	98.18	13.72
95th-Percentile Queue Length [veh/ln]	4.40	14.31	7.81	1.48	16.40	15.04	4.66	7.40	3.46	6.11	7.07	0.99
95th-Percentile Queue Length [ft/ln]	110.10	357.71	195.15	37.12	410.09	376.11	116.44	185.09	86.54	152.65	176.73	24.70

**Movement, Approach, & Intersection Results**

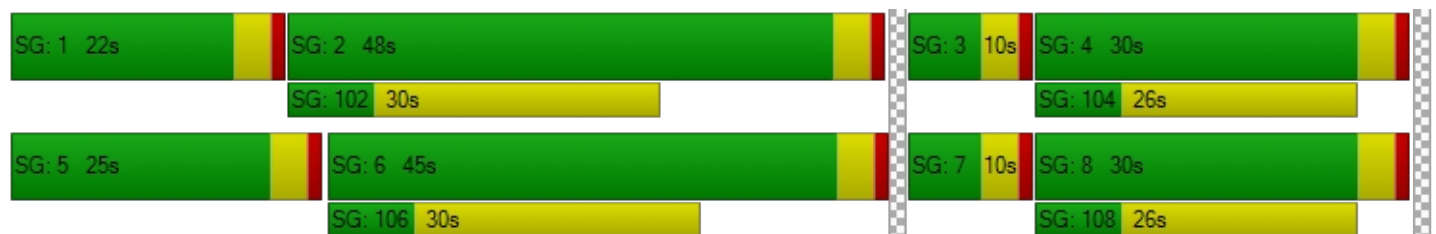
d_M, Delay for Movement [s/veh]	26.09	38.06	33.84	24.40	45.49	44.80	61.05	19.33	17.99	52.28	17.27	15.03
Movement LOS	C	D	C	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	35.85			44.23			24.01			27.78		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.46											
Intersection LOS	C											
Intersection V/C	0.544											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.809			2.638			2.742			2.837		
Crosswalk LOS	C			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			745			473			473		
d_b, Bicycle Delay [s]	19.80			21.64			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.447			2.226			2.148			2.218		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	56	1309	33	39	1419	39	63	80	88	71	111	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	1309	33	39	1419	39	63	80	88	71	111	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	327	8	10	355	10	16	20	22	18	28	8
Total Analysis Volume [veh/h]	56	1309	33	39	1419	39	63	80	88	71	111	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	35	0	0	35	0	0	75	0	0	75	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.36	0.36	0.02	0.40	0.39	0.13	0.04	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1159	1482	1404	1190	1482	1404	306	77	264
d1, Uniform Delay [s]	2.73	4.16	4.15	2.71	4.38	4.36	45.79	41.55	43.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	1.06	1.10	0.05	1.24	1.29	3.78	31.53	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.47	0.46	0.03	0.51	0.50	0.75	0.92	0.54
d, Delay for Lane Group [s/veh]	2.81	5.22	5.25	2.76	5.62	5.65	49.57	73.08	45.13
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.25	4.60	4.33	0.17	5.27	4.97	6.45	2.38	3.75
50th-Percentile Queue Length [ft/ln]	6.18	115.11	108.37	4.24	131.87	124.15	161.27	59.60	93.71
95th-Percentile Queue Length [veh/ln]	0.44	8.12	7.75	0.31	9.04	8.62	10.62	4.29	6.75
95th-Percentile Queue Length [ft/ln]	11.12	203.09	193.73	7.64	226.04	215.52	265.40	107.27	168.68

**Movement, Approach, & Intersection Results**

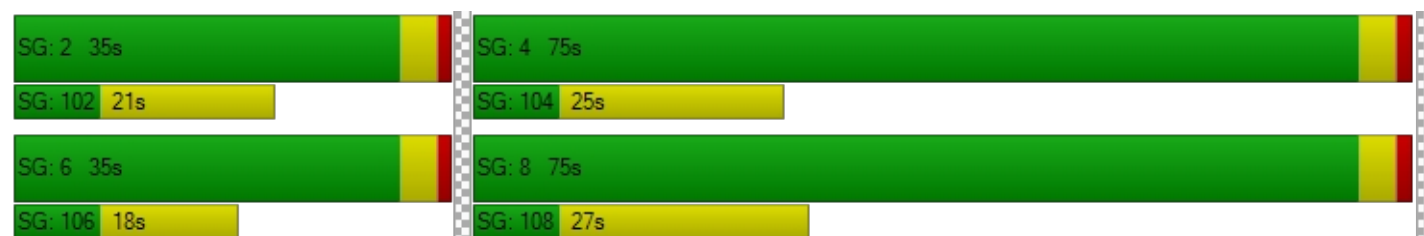
d_M, Delay for Movement [s/veh]	2.81	5.23	5.25	2.76	5.64	5.65	49.57	49.57	49.57	73.08	45.13	45.13
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	5.14			5.56			49.57			54.36		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	11.57											
Intersection LOS	B											
Intersection V/C	0.565											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.991			2.965			2.017			2.125		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			564			1291			1291		
d_b, Bicycle Delay [s]	28.37			28.37			6.91			6.91		
I_b,int, Bicycle LOS Score for Intersection	2.713			2.795			1.941			1.914		
Bicycle LOS	B			C			A			A		

**Sequence**


Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.446

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	95	1045	62	50	970	45	52	39	80	122	36	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	1045	62	50	970	45	52	39	80	122	36	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	261	16	13	243	11	13	10	20	31	9	11
Total Analysis Volume [veh/h]	95	1045	62	50	970	45	52	39	80	122	36	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.05	0.30	0.30	0.03	0.28	0.27	0.10	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1318	1516	1436	1299	1516	1436	276	286
d1, Uniform Delay [s]	2.37	3.22	3.19	2.31	3.10	3.08	46.00	46.83
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.72	0.74	0.06	0.63	0.65	2.28	3.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.38	0.37	0.04	0.35	0.34	0.62	0.70
d, Delay for Lane Group [s/veh]	2.48	3.94	3.93	2.36	3.73	3.73	48.27	49.94
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.37	3.01	2.79	0.19	2.66	2.48	4.65	5.58
50th-Percentile Queue Length [ft/ln]	9.23	75.32	69.79	4.74	66.42	61.89	116.27	139.43
95th-Percentile Queue Length [veh/ln]	0.66	5.42	5.02	0.34	4.78	4.46	8.19	9.45
95th-Percentile Queue Length [ft/ln]	16.62	135.57	125.62	8.53	119.56	111.39	204.69	236.25

**Movement, Approach, & Intersection Results**

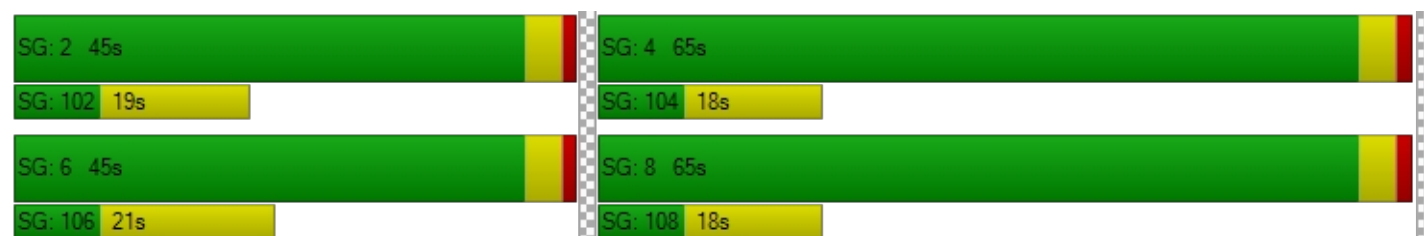
d_M, Delay for Movement [s/veh]	2.48	3.93	3.93	2.36	3.73	3.73	48.27	48.27	48.27	49.94	49.94	49.94
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.82			3.67			48.27			49.94		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.14											
Intersection LOS	B											
Intersection V/C	0.446											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.946			2.813			2.029			1.967		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.551			2.438			1.842			1.890		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	46.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	203	1299	261	266	1232	208	257	748	312	249	829	234
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	1299	261	266	1232	208	257	748	312	249	829	234
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	325	65	67	308	52	64	187	78	62	207	59
Total Analysis Volume [veh/h]	203	1299	261	266	1232	208	257	748	312	249	829	234
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	40	0	12	41	0	21	39	0	19	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	36	36	8	37	37	17	35	35	15	33	33
g / C, Green / Cycle	0.06	0.33	0.33	0.07	0.34	0.34	0.16	0.32	0.32	0.14	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.34	0.15	0.08	0.31	0.14	0.14	0.13	0.17	0.14	0.15	0.13
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1243	589	255	1277	605	280	1807	571	248	1705	539
d1, Uniform Delay [s]	51.19	37.01	29.13	51.00	35.18	28.30	45.75	29.53	31.04	47.42	31.61	31.05
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.42	26.04	0.53	38.73	3.42	0.48	11.74	0.70	3.74	27.57	0.99	2.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.91	1.05	0.44	1.04	0.93	0.43	0.92	0.41	0.55	1.00	0.49	0.43
d, Delay for Lane Group [s/veh]	64.61	63.05	29.66	89.73	38.60	28.78	57.49	30.23	34.77	75.00	32.61	33.59
Lane Group LOS	E	F	C	F	D	C	E	C	C	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.19	20.81	5.48	4.86	15.52	5.33	7.79	5.27	7.37	8.65	6.15	5.36
50th-Percentile Queue Length [ft/ln]	79.68	520.34	137.04	121.57	388.12	133.19	194.70	131.87	184.37	216.30	153.65	134.05
95th-Percentile Queue Length [veh/ln]	5.74	29.14	9.32	8.60	21.99	9.11	12.36	9.04	11.83	13.50	10.21	9.16
95th-Percentile Queue Length [ft/ln]	143.43	728.45	233.03	214.95	549.66	227.83	309.12	226.03	295.71	337.52	255.29	228.98

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	64.61	63.05	29.66	89.73	38.20	28.78	57.49	30.23	34.77	75.00	32.61	33.59
Movement LOS	E	F	C	F	D	C	E	C	C	F	C	C
d_A, Approach Delay [s/veh]	58.29			45.08			36.63			40.83		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	46.16											
Intersection LOS	D											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.168			3.090			3.047			3.050		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			673			636			600		
d_b, Bicycle Delay [s]	24.89			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.014			2.498			2.284			2.281		
Bicycle LOS	C			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.812

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	296	1054	120	175	901	168	194	718	272	200	662	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	296	1054	120	175	901	168	194	718	272	200	662	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	264	30	44	225	42	49	180	68	50	166	43
Total Analysis Volume [veh/h]	296	1054	120	175	901	168	194	718	272	200	662	170
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	47	0	19	48	0	10	33	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	35	35	48	30	30	14	41	41	9	36	36
g / C, Green / Cycle	0.44	0.32	0.32	0.44	0.27	0.27	0.13	0.37	0.37	0.08	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.16	0.28	0.07	0.10	0.24	0.09	0.11	0.19	0.15	0.06	0.23	0.22
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	484	1224	580	418	1046	495	227	1420	673	274	619	587
d1, Uniform Delay [s]	20.72	35.00	27.10	19.18	37.90	31.89	47.15	26.63	25.44	49.62	32.61	31.92
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	1.91	0.17	0.67	2.23	0.40	8.99	1.29	1.81	3.75	6.91	5.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.61	0.86	0.21	0.42	0.86	0.34	0.86	0.51	0.40	0.73	0.71	0.66
d, Delay for Lane Group [s/veh]	21.97	36.91	27.27	19.85	40.14	32.30	56.14	27.92	27.25	53.36	39.52	37.75
Lane Group LOS	C	D	C	B	D	C	E	C	C	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.22	13.33	2.32	2.84	11.71	3.63	5.75	7.44	5.54	2.83	11.40	9.75
50th-Percentile Queue Length [ft/ln]	130.61	333.35	58.04	71.10	292.72	90.69	143.75	186.11	138.55	70.65	285.10	243.69
95th-Percentile Queue Length [veh/ln]	8.97	19.32	4.18	5.12	17.32	6.53	9.68	11.92	9.40	5.09	16.94	14.87
95th-Percentile Queue Length [ft/ln]	224.32	483.06	104.48	127.99	433.01	163.24	242.07	297.98	235.08	127.18	423.55	371.70

**Movement, Approach, & Intersection Results**

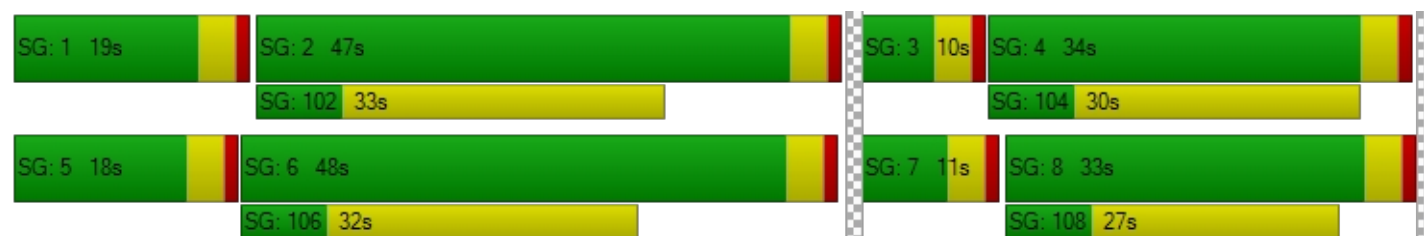
d_M, Delay for Movement [s/veh]	21.97	36.91	27.27	19.85	40.14	32.30	56.14	27.92	27.25	53.36	38.93	37.75
Movement LOS	C	D	C	B	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	33.12			36.22			32.39			41.53		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	35.49											
Intersection LOS	D											
Intersection V/C	0.812											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.924			2.895			2.961			2.973		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			800			527			545		
d_b, Bicycle Delay [s]	20.40			19.80			29.82			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.772			2.586			2.211			2.411		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	441	0	0	354	175	0	0	0	55	96	92
Total Analysis Volume [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	68	58	58		24	24	24
g / C, Green / Cycle	0.06	0.68	0.58	0.58		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.37	0.39		0.12	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3876	2210	1047		432	912	432
d1, Uniform Delay [s]	45.82	7.41	13.92	14.39		32.87	32.13	36.28
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.39	1.42	3.46		0.91	0.31	4.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.45	0.64	0.67		0.50	0.42	0.85
d, Delay for Lane Group [s/veh]	48.19	7.80	15.34	17.85		33.78	32.44	41.04
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	5.24	10.22	11.12		4.63	3.93	8.97
50th-Percentile Queue Length [ft/ln]	35.98	131.06	255.39	277.94		115.78	98.32	224.35
95th-Percentile Queue Length [veh/ln]	2.59	9.00	15.46	16.59		8.16	7.08	13.89
95th-Percentile Queue Length [ft/ln]	64.76	224.93	386.44	414.65		204.01	176.97	347.18

**Movement, Approach, & Intersection Results**

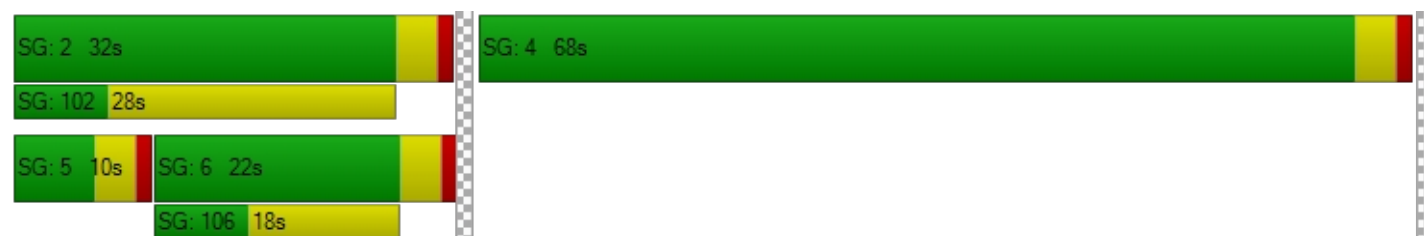
d_M, Delay for Movement [s/veh]	48.19	7.80	0.00	0.00	15.35	17.85	0.00	0.00	0.00	33.78	32.44	41.04
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	10.25			16.18			0.00			36.00		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.81											
Intersection LOS	B											
Intersection V/C	0.714											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0				0.0				11.0		11.0	
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00				0.00				0.00		0.00	
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00				0.00				0.00		0.00	
d_p, Pedestrian Delay [s]	0.00				0.00				39.61		39.61	
I_p,int, Pedestrian LOS Score for Intersection	0.000				0.000				2.304		2.372	
Crosswalk LOS	F				F				B		B	
s_b, Saturation Flow Rate of the bicycle lane	2000				2000				2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	560				360				0		1280	
d_b, Bicycle Delay [s]	25.92				33.62				50.00		6.48	
I_b,int, Bicycle LOS Score for Intersection	2.591				2.723				4.132		2.359	
Bicycle LOS	B				B				D		B	

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.896

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	255	0	0	291	89	0	0	0	33	137	203
Total Analysis Volume [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	34	0	0	23	0	0	0	0	0	66	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	43	32	32		49	49	49
g / C, Green / Cycle	0.07	0.43	0.32	0.32		0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.06	0.18	0.27	0.28		0.19	0.18	0.45
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	2472	1227	581		875	924	875
d1, Uniform Delay [s]	45.79	19.52	31.27	31.91		16.33	16.03	23.99
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.27
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.51	6.44	16.41		0.29	0.24	10.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.41	0.83	0.87		0.39	0.36	0.93
d, Delay for Lane Group [s/veh]	57.11	20.03	37.70	48.32		16.62	16.27	34.39
Lane Group LOS	E	C	D	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.42	12.09	13.87		4.94	4.72	19.30
50th-Percentile Queue Length [ft/ln]	72.68	135.60	302.31	346.78		123.47	117.93	482.43
95th-Percentile Queue Length [veh/ln]	5.23	9.24	17.80	19.98		8.58	8.28	26.50
95th-Percentile Queue Length [ft/ln]	130.82	231.08	444.88	499.48		214.59	206.97	662.53

**Movement, Approach, & Intersection Results**

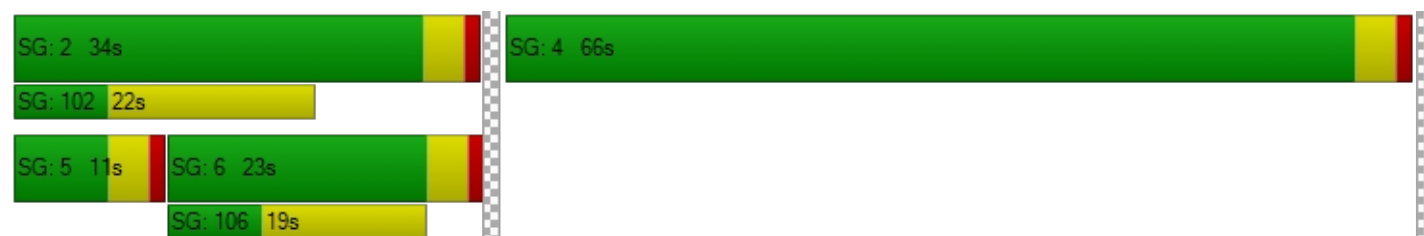
d_M, Delay for Movement [s/veh]	57.11	20.03	0.00	0.00	39.07	48.32	0.00	0.00	0.00	16.62	16.41	34.39
Movement LOS	E	C			D	D				B	B	C
d_A, Approach Delay [s/veh]	23.44			41.24			0.00			26.19		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	30.98											
Intersection LOS	C											
Intersection V/C	0.896											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.212	2.430
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	380	0	1240
d_b, Bicycle Delay [s]	24.50	32.81	50.00	7.22
I_b,int, Bicycle LOS Score for Intersection	2.176	2.396	4.132	2.791
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	268	69	125	292	0	226	79	46	0	0	0
Total Analysis Volume [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	17	62	30	30	30	
g / C, Green / Cycle	0.41	0.41	0.17	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.15	0.14	0.20	0.26	0.17	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2340	739	588	3526	1055	573	543	
d1, Uniform Delay [s]	21.40	20.52	40.37	9.15	32.90	29.29	27.15	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.44	3.53	0.25	2.14	0.84	0.36	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.37	0.85	0.33	0.86	0.55	0.34	
d, Delay for Lane Group [s/veh]	22.05	21.96	43.90	9.40	35.04	30.13	27.51	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.08	4.69	6.18	3.85	10.38	6.42	3.40	
50th-Percentile Queue Length [ft/ln]	152.06	117.31	154.38	96.25	259.54	160.49	84.99	
95th-Percentile Queue Length [veh/ln]	10.13	8.25	10.25	6.93	15.67	10.57	6.12	
95th-Percentile Queue Length [ft/ln]	253.18	206.13	256.26	173.25	391.64	264.37	152.99	

**Movement, Approach, & Intersection Results**

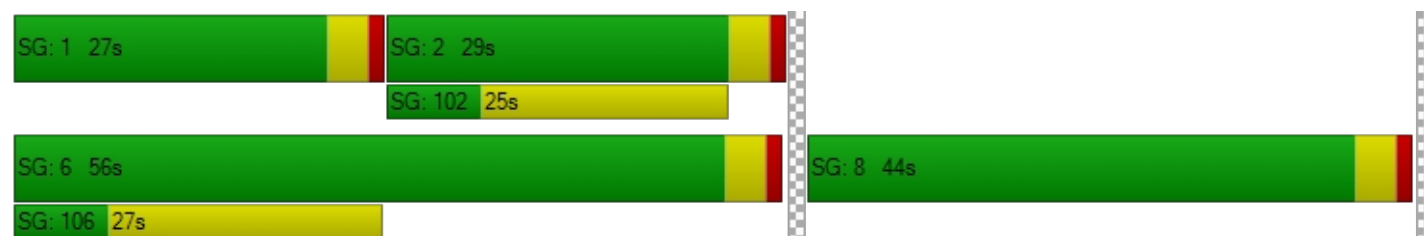
d_M, Delay for Movement [s/veh]	0.00	22.05	21.96	43.90	9.40	0.00	35.04	30.13	27.51	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	22.03			19.74			32.95			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	24.63											
Intersection LOS	C											
Intersection V/C	0.669											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.478			2.252		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.302			2.475			3.875			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	172	43	153	193	0	75	190	16	0	0	0
Total Analysis Volume [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	35	35	19	59	33	33	33	
g / C, Green / Cycle	0.35	0.35	0.19	0.59	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.17	0.20	0.30	0.28	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1347	638	682	2240	595	628	595	
d1, Uniform Delay [s]	24.52	24.77	39.26	10.57	31.85	31.00	23.22	
k, delay calibration	0.50	0.50	0.11	0.50	0.18	0.15	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.98	2.27	4.43	0.42	8.14	4.26	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.42	0.45	0.89	0.34	0.90	0.84	0.11	
d, Delay for Lane Group [s/veh]	25.50	27.04	43.69	10.99	39.99	35.26	23.29	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.25	5.52	7.62	4.25	13.27	12.20	1.04	
50th-Percentile Queue Length [ft/ln]	131.21	137.93	190.42	106.14	331.81	305.02	25.96	
95th-Percentile Queue Length [veh/ln]	9.01	9.37	12.14	7.62	19.25	17.93	1.87	
95th-Percentile Queue Length [ft/ln]	225.14	234.24	303.58	190.62	481.18	448.23	46.73	

**Movement, Approach, & Intersection Results**

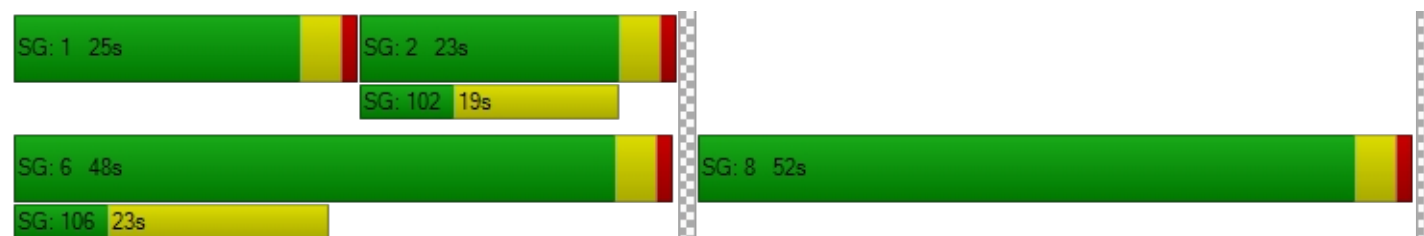
d_M, Delay for Movement [s/veh]	0.00	25.76	27.04	43.69	10.99	0.00	39.99	36.71	23.29	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	26.01			25.45			36.84			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.40											
Intersection LOS	C											
Intersection V/C	0.716											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.310			2.471		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.032			2.698			2.487			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.127

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	92	319	196	5	554
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	92	319	196	5	554
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	80	49	1	139
Total Analysis Volume [veh/h]	0	92	319	196	5	554
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.13	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	10.72	0.00	0.00	8.44	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.44	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	10.90	0.00	0.00	0.36	0.00
d_A, Approach Delay [s/veh]	10.72		0.00		0.08	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.88					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	14.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.406

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	855	46	17	432	0	30	0	63	197	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	855	46	17	432	0	30	0	63	197	0	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	214	12	4	108	0	8	0	16	49	0	12
Total Analysis Volume [veh/h]	0	855	46	17	432	0	30	0	63	197	0	46
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	56	0	10	66	0	0	44	0	44	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	88	88	14	14	14	14
g / C, Green / Cycle	0.74	0.74	0.80	0.80	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.24	0.25	0.01	0.11	0.02	0.04	0.11	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1404	1330	1363	3034	266	264	210	232
d1, Uniform Delay [s]	4.91	4.99	2.25	2.52	42.44	43.25	46.87	42.83
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	0.69	0.00	0.10	0.19	0.46	17.07	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.32	0.34	0.01	0.14	0.11	0.24	0.94	0.20
d, Delay for Lane Group [s/veh]	5.51	5.68	2.26	2.62	42.63	43.71	63.93	43.25
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.23	3.30	0.06	0.84	0.74	1.58	6.25	1.15
50th-Percentile Queue Length [ft/ln]	80.76	82.56	1.44	20.96	18.45	39.58	156.19	28.68
95th-Percentile Queue Length [veh/ln]	5.81	5.94	0.10	1.51	1.33	2.85	10.35	2.06
95th-Percentile Queue Length [ft/ln]	145.36	148.61	2.59	37.73	33.20	71.25	258.67	51.62

**Movement, Approach, & Intersection Results**

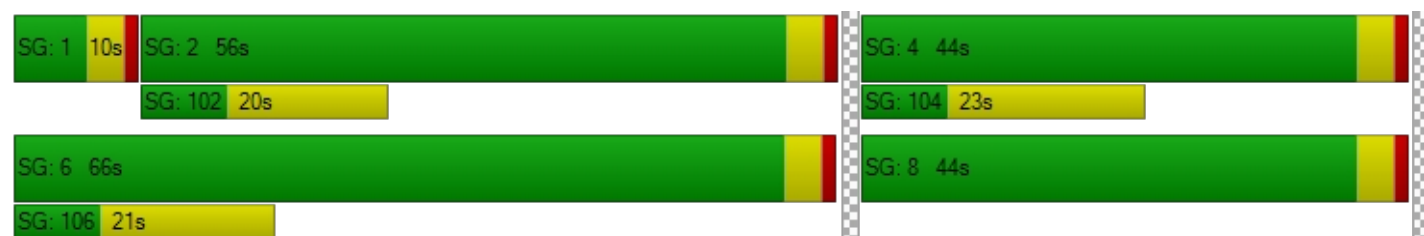
d_M, Delay for Movement [s/veh]	0.00	5.59	5.68	2.26	2.62	0.00	42.63	43.71	43.71	63.93	0.00	43.25
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	5.60			2.60			43.36			60.02		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.73											
Intersection LOS	B											
Intersection V/C	0.406											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.621			1.770			2.068		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			1127			727			0		
d_b, Bicycle Delay [s]	15.29			10.47			22.27			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.303			1.930			1.713			4.132		
Bicycle LOS	B			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.373

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	432	392	327	1	61	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	432	392	327	1	61	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	98	82	0	15	22
Total Analysis Volume [veh/h]	432	392	327	1	61	88
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.35	0.00	0.00	0.00	0.37	0.12
d_M, Delay for Movement [s/veh]	9.49	0.00	0.00	0.00	38.28	21.30
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	1.60	0.00	0.00	0.00	2.60	2.60
95th-Percentile Queue Length [ft/ln]	39.89	0.00	0.00	0.00	64.98	64.98
d_A, Approach Delay [s/veh]	4.98		0.00		28.25	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	6.39					
Intersection LOS	E					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	36.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	351	819	417	1	8	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	351	819	417	1	8	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	205	104	0	2	43
Total Analysis Volume [veh/h]	351	819	417	1	8	170
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.31	0.01	0.00	0.00	0.06	0.27
d_M, Delay for Movement [s/veh]	9.55	0.00	0.00	0.00	36.07	13.90
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh/ln]	1.32	0.00	0.00	0.00	1.43	1.43
95th-Percentile Queue Length [ft/ln]	32.88	0.00	0.00	0.00	35.72	35.72
d_A, Approach Delay [s/veh]	2.87		0.00		14.90	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.40					
Intersection LOS	E					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	23.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.076

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	1148	33	22	493	30	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1148	33	22	493	30	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	287	8	6	123	8	5
Total Analysis Volume [veh/h]	1148	33	22	493	30	18
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**



V/C, Movement V/C Ratio	0.01	0.00	0.04	0.00	0.12	0.08
d_M, Delay for Movement [s/veh]	0.00	0.00	11.32	0.00	22.20	23.58
Movement LOS	A	A	B	A	C	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.12	0.00	0.69	0.69
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.89	0.00	17.28	17.28
d_A, Approach Delay [s/veh]	0.00		0.48		22.72	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.77					
Intersection LOS	C					

### Intersection Level Of Service Report

#### Intersection 31: Lemon Street at Parking Structure

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.108

#### Intersection Setup

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	575	326	0	432	6	0	0	28	0	0	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	575	326	0	432	6	0	0	28	0	0	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	144	82	0	108	2	0	0	7	0	0	15
Total Analysis Volume [veh/h]	6	575	326	0	432	6	0	0	28	0	0	60
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.11
d_M, Delay for Movement [s/veh]	8.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.75	0.00	0.00	12.26
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.36
95th-Percentile Queue Length [ft/ln]	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.00	9.02
d_A, Approach Delay [s/veh]	0.05			0.00			9.75			12.26		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	0.74											
Intersection LOS	B											





*APPENDIX F-VI*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	100	623	68	166	513	160	162	667	88	148	693	167
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	623	68	166	513	160	162	667	88	148	693	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	156	17	42	128	40	41	167	22	37	173	42
Total Analysis Volume [veh/h]	100	623	68	166	513	160	162	667	88	148	693	167
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	16	45	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	59	59	6	59	59	12	19	19	10	17	17
g / C, Green / Cycle	0.05	0.54	0.54	0.05	0.54	0.54	0.11	0.17	0.17	0.10	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.11	0.04	0.05	0.12	0.12	0.09	0.13	0.14	0.04	0.12	0.09
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	185	3046	962	194	2040	967	192	644	305	334	902	285
d1, Uniform Delay [s]	50.84	13.40	12.40	51.57	13.42	13.42	48.28	43.77	44.13	47.04	44.40	42.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.45	0.15	0.14	10.36	0.25	0.54	9.64	2.12	5.56	0.92	1.41	1.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.20	0.07	0.86	0.22	0.22	0.84	0.78	0.82	0.44	0.77	0.59
d, Delay for Lane Group [s/veh]	53.29	13.55	12.54	61.93	13.67	13.96	57.92	45.90	49.69	47.96	45.81	44.91
Lane Group LOS	D	B	B	E	B	B	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	2.68	0.84	2.54	2.99	2.91	4.86	6.73	7.04	1.96	6.13	4.36
50th-Percentile Queue Length [ft/ln]	35.13	67.05	20.95	63.62	74.69	72.80	121.60	168.18	176.09	48.94	153.20	108.97
95th-Percentile Queue Length [veh/ln]	2.53	4.83	1.51	4.58	5.38	5.24	8.48	10.98	11.40	3.52	10.19	7.78
95th-Percentile Queue Length [ft/ln]	63.24	120.69	37.71	114.51	134.45	131.04	212.02	274.53	284.90	88.08	254.70	194.56

**Movement, Approach, & Intersection Results**

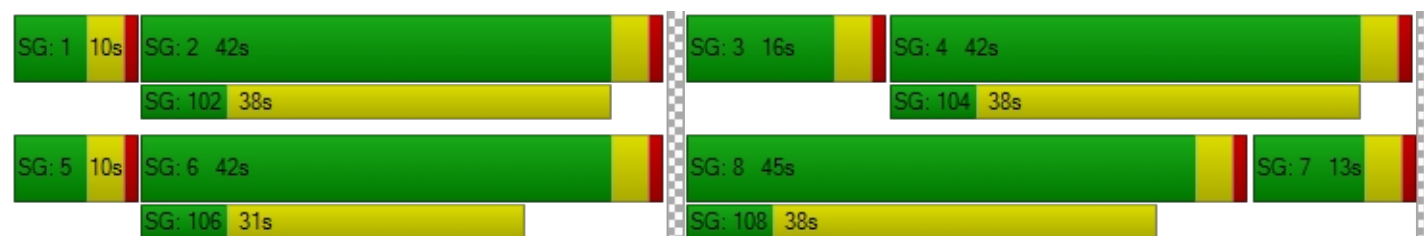
d_M, Delay for Movement [s/veh]	53.29	13.55	12.54	61.93	13.70	13.96	57.92	46.82	49.69	47.96	45.81	44.91
Movement LOS	D	B	B	E	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	18.49			23.29			49.06			45.98		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	35.30											
Intersection LOS	D											
Intersection V/C	0.431											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.026			2.953			2.864			3.066		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			745			691		
d_b, Bicycle Delay [s]	23.56			23.56			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.995			2.021			2.064			2.114		
Bicycle LOS	A			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.455

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	18	724	570	51	736	20	37	98	15	530	68	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	724	570	51	736	20	37	98	15	530	68	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	181	143	13	184	5	9	25	4	133	17	0
Total Analysis Volume [veh/h]	18	724	570	51	736	20	37	98	15	530	68	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	40	0	12	42	0	0	24	0	0	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	60	5	63	63	8	8	8	21	21
g / C, Green / Cycle	0.02	0.55	0.04	0.57	0.57	0.07	0.07	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.13	0.03	0.16	0.08	0.02	0.05	0.01	0.17	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	43	3122	79	2157	1022	128	136	128	345	345
d1, Uniform Delay [s]	52.95	12.90	51.78	12.25	11.21	48.47	50.06	47.88	43.10	43.19
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.16	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.19	0.17	8.41	0.33	0.30	1.22	7.09	0.40	9.24	10.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.23	0.64	0.28	0.15	0.29	0.72	0.12	0.86	0.87
d, Delay for Lane Group [s/veh]	59.14	13.07	60.19	12.58	11.51	49.69	57.15	48.28	52.34	53.25
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.56	3.07	1.57	3.82	1.75	1.01	2.90	0.40	8.67	8.84
50th-Percentile Queue Length [ft/ln]	14.12	76.64	39.21	95.56	43.75	25.19	72.59	10.01	216.68	221.04
95th-Percentile Queue Length [veh/ln]	1.02	5.52	2.82	6.88	3.15	1.81	5.23	0.72	13.50	13.72
95th-Percentile Queue Length [ft/ln]	25.42	137.96	70.58	172.01	78.74	45.34	130.65	18.01	337.38	342.95

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.14	13.07	0.00	60.19	12.39	11.51	49.69	57.15	48.28	52.74	53.25	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	14.19			15.39			54.42			52.80		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.29											
Intersection LOS	C											
Intersection V/C	0.455											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	2.822	2.203	2.193
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	655	691	364	545
d_b, Bicycle Delay [s]	24.89	23.56	36.82	29.09
I_b,int, Bicycle LOS Score for Intersection	1.968	2.003	1.807	2.546
Bicycle LOS	A	B	A	B

**Sequence**



Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	66	998	35	140	1129	14	31	65	66	46	93	329
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	998	35	140	1129	14	31	65	66	46	93	329
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	250	9	35	282	4	8	16	17	12	23	82
Total Analysis Volume [veh/h]	66	998	35	140	1129	14	31	65	66	46	93	329
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	11	60	0	13	62	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	69	69	9	73	73	20	20	20	20	20	33
g / C, Green / Cycle	0.05	0.63	0.63	0.08	0.66	0.66	0.18	0.18	0.18	0.18	0.18	0.30
(v / s)_i Volume / Saturation Flow Rate	0.04	0.28	0.28	0.04	0.30	0.01	0.02	0.03	0.04	0.03	0.05	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	88	1187	1125	292	2505	1187	286	347	329	309	347	544
d1, Uniform Delay [s]	51.60	10.75	10.70	48.11	9.08	6.43	37.38	38.04	38.13	37.70	38.62	32.75
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.21
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.84	1.23	1.27	1.22	0.59	0.02	0.17	0.26	0.30	0.22	0.41	2.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.45	0.44	0.48	0.45	0.01	0.11	0.19	0.20	0.15	0.27	0.60
d, Delay for Lane Group [s/veh]	63.44	11.98	11.97	49.33	9.67	6.45	37.54	38.29	38.43	37.92	39.03	34.83
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.08	6.76	6.32	1.88	6.24	0.11	0.71	1.51	1.54	1.06	2.20	7.74
50th-Percentile Queue Length [ft/ln]	52.12	169.04	157.96	47.07	155.99	2.80	17.73	37.75	38.48	26.52	54.94	193.41
95th-Percentile Queue Length [veh/ln]	3.75	11.03	10.44	3.39	10.34	0.20	1.28	2.72	2.77	1.91	3.96	12.30
95th-Percentile Queue Length [ft/ln]	93.81	275.66	261.02	84.72	258.40	5.04	31.92	67.96	69.26	47.73	98.89	307.45

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.44	11.98	11.97	49.33	9.67	6.45	37.54	38.29	38.43	37.92	39.03	34.83
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	15.07			13.96			38.21			35.97		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.09											
Intersection LOS	B											
Intersection V/C	0.559											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.831			3.015			2.222			2.447		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1018			1055			600			600		
d_b, Bicycle Delay [s]	13.25			12.29			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.466			2.618			1.827			2.332		
Bicycle LOS	B			B			A			B		

**Sequence**




Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	73.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.390

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	49	13	16	56	7	4	45	21	41	61	16
Total Analysis Volume [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	33	0	0	34	0	0	43	43	0	43	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	13	13	59	13	13	13
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.39	0.12	0.12	0.54	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.03	0.03	0.14	0.01	0.09	0.05	0.09	0.08	0.08
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	697	697	697	697	697	112	222	972	93	222	210
d1, Uniform Delay [s]	23.15	23.29	21.27	21.38	23.97	43.25	47.35	12.19	45.19	46.81	46.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.00	1.07	0.21	0.25	1.44	0.58	6.98	0.17	356.48	4.41	3.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.29	0.08	0.09	0.36	0.14	0.81	0.09	1.77	0.72	0.68
d, Delay for Lane Group [s/veh]	24.16	24.36	21.48	21.63	25.41	43.83	54.33	12.36	401.66	51.22	50.49
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.66	3.86	0.91	1.07	4.87	0.41	5.22	1.03	11.52	4.49	3.99
50th-Percentile Queue Length [ft/ln]	91.57	96.52	22.63	26.63	121.83	10.18	130.58	25.78	288.03	112.23	99.87
95th-Percentile Queue Length [veh/ln]	6.59	6.95	1.63	1.92	8.49	0.73	8.97	1.86	20.10	7.96	7.19
95th-Percentile Queue Length [ft/ln]	164.82	173.74	40.74	47.93	212.33	18.32	224.28	46.40	502.38	199.10	179.77

**Movement, Approach, & Intersection Results**

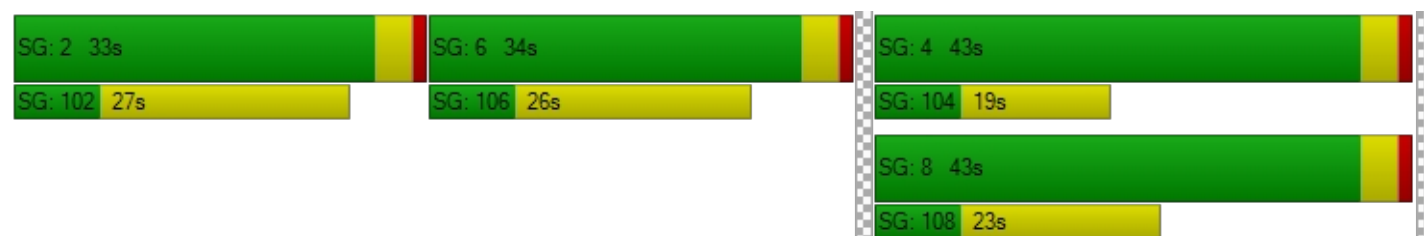
d_M, Delay for Movement [s/veh]	24.16	24.36	21.48	21.63	25.41	25.41	43.83	54.33	12.36	401.66	50.97	50.49
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	23.94			24.66			41.14			173.80		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	73.62											
Intersection LOS	E											
Intersection V/C	0.390											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.599			2.163			2.456			2.327		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			545			709			709		
d_b, Bicycle Delay [s]	29.82			29.09			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.307			2.074			2.022			1.946		
Bicycle LOS	B			B			B			A		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.322

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	126	93	434	333	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	126	93	434	333	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	32	23	109	83	3
Total Analysis Volume [veh/h]	16	126	93	434	333	11
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.23	0.18	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	160	160	1464	1593	1593	1509
d1, Uniform Delay [s]	46.00	49.03	1.51	1.86	1.74	1.44
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	8.32	0.08	0.42	0.30	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.06	0.27	0.21	0.01
d, Delay for Lane Group [s/veh]	46.27	57.34	1.60	2.28	2.04	1.45
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.41	3.75	0.24	1.34	0.96	0.03
50th-Percentile Queue Length [ft/ln]	10.36	93.69	5.88	33.53	24.01	0.66
95th-Percentile Queue Length [veh/ln]	0.75	6.75	0.42	2.41	1.73	0.05
95th-Percentile Queue Length [ft/ln]	18.65	168.64	10.58	60.35	43.22	1.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	46.27	57.34	1.60	2.28	2.04	1.45
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	56.09		2.16		2.02	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	9.67					
Intersection LOS	A					
Intersection V/C	0.322					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.162	2.270	2.208
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.002	4.700
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 85s

SG: 4 25s

SG: 101 26s



SG: 104 21s

SG: 8 25s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.461

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	43	1004	31	28	1007	56	57	68	59	106	136	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	1004	31	28	1007	56	57	68	59	106	136	106
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	251	8	7	252	14	14	17	15	27	34	27
Total Analysis Volume [veh/h]	43	1004	31	28	1007	56	57	68	59	106	136	106
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	10	55	0	11	30	0	15	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	83	75	75	83	74	74	19	8	8	19	10	10
g / C, Green / Cycle	0.75	0.69	0.69	0.75	0.68	0.68	0.17	0.07	0.07	0.17	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.02	0.28	0.28	0.02	0.29	0.28	0.03	0.04	0.03	0.06	0.07	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1192	1299	1231	1208	1283	1216	298	134	127	357	176	167
d1, Uniform Delay [s]	3.45	7.66	7.63	3.42	8.17	8.11	38.71	49.32	49.21	39.83	48.66	48.34
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.96	1.00	0.01	1.05	1.07	0.31	2.89	2.73	0.46	5.96	4.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.41	0.41	0.02	0.43	0.42	0.19	0.50	0.47	0.30	0.74	0.67
d, Delay for Lane Group [s/veh]	3.51	8.62	8.62	3.43	9.22	9.18	39.02	52.20	51.94	40.29	54.62	53.00
Lane Group LOS	A	A	A	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.22	5.36	5.02	0.14	5.81	5.38	1.34	1.88	1.68	2.56	3.76	3.19
50th-Percentile Queue Length [ft/ln]	5.60	134.03	125.52	3.38	145.22	134.41	33.55	47.07	42.01	64.11	93.96	79.69
95th-Percentile Queue Length [veh/ln]	0.40	9.16	8.70	0.24	9.76	9.18	2.42	3.39	3.02	4.62	6.76	5.74
95th-Percentile Queue Length [ft/ln]	10.08	228.97	217.39	6.08	244.04	229.48	60.39	84.73	75.62	115.40	169.12	143.44

**Movement, Approach, & Intersection Results**

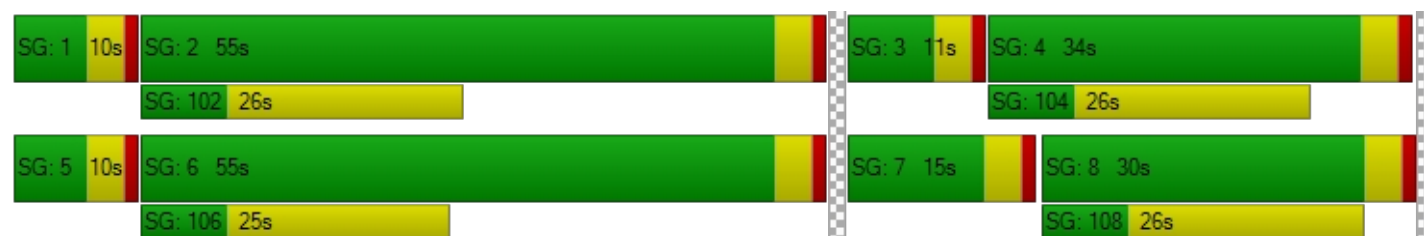
d_M, Delay for Movement [s/veh]	3.51	8.62	8.62	3.43	9.21	9.18	39.02	52.20	51.94	40.29	54.54	53.00
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.42			9.06			48.03			49.73		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	16.70											
Intersection LOS	B											
Intersection V/C	0.461											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.761			2.759			2.434			2.430		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			927			473			545		
d_b, Bicycle Delay [s]	15.82			15.82			32.07			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.449			2.460			1.711			1.847		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	111	947	134	138	856	135	198	444	111	362	720	103
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	947	134	138	856	135	198	444	111	362	720	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	237	34	35	214	34	50	111	28	91	180	26
Total Analysis Volume [veh/h]	111	947	134	138	856	135	198	444	111	362	720	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	15	50	0	19	54	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	62	52	52	62	52	52	40	21	21	40	25	25
g / C, Green / Cycle	0.57	0.48	0.48	0.57	0.48	0.48	0.36	0.19	0.19	0.36	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.29	0.08	0.27	0.26	0.11	0.16	0.14	0.20	0.19	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	744	901	854	697	903	856	428	359	340	486	867	411
d1, Uniform Delay [s]	11.08	21.68	21.30	11.26	20.87	20.50	25.18	42.86	42.34	28.05	40.46	34.78
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	3.32	3.14	0.14	2.68	2.53	0.78	4.68	3.61	2.29	2.13	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.63	0.60	0.20	0.58	0.55	0.46	0.82	0.77	0.74	0.83	0.25
d, Delay for Lane Group [s/veh]	11.51	25.00	24.44	11.40	23.54	23.04	25.96	47.53	45.95	30.34	42.59	35.10
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.32	11.46	10.22	1.58	10.09	8.96	3.79	8.11	7.02	7.85	9.46	2.30
50th-Percentile Queue Length [ft/ln]	32.92	286.39	255.54	39.49	252.22	223.90	94.83	202.67	175.40	196.15	236.46	57.49
95th-Percentile Queue Length [veh/ln]	2.37	17.01	15.46	2.84	15.30	13.86	6.83	12.78	11.36	12.44	14.50	4.14
95th-Percentile Queue Length [ft/ln]	59.25	425.16	386.62	71.08	382.45	346.60	170.69	319.41	284.00	311.00	362.56	103.48

**Movement, Approach, & Intersection Results**

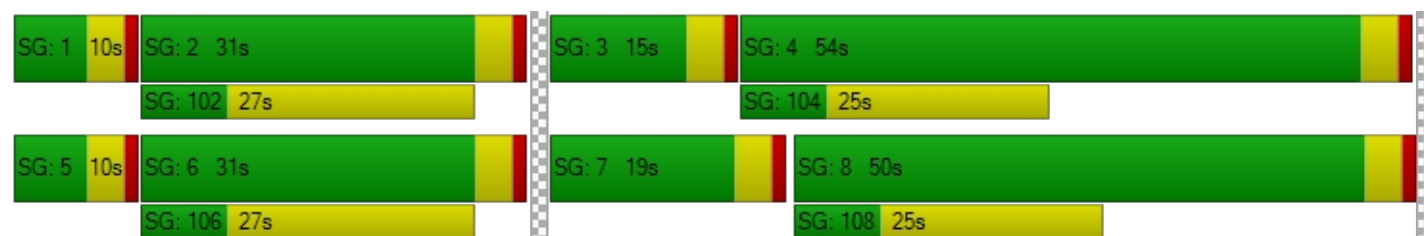
d_M, Delay for Movement [s/veh]	11.51	24.78	24.44	11.40	23.34	23.04	25.96	47.00	45.95	30.34	42.59	35.10
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	23.50			21.85			41.31			38.20		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.30											
Intersection LOS	C											
Intersection V/C	0.762											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.908			2.842			2.723			2.868		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			836			909		
d_b, Bicycle Delay [s]	31.31			31.31			18.62			16.36		
I_b,int, Bicycle LOS Score for Intersection	2.543			2.491			2.181			2.537		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	100	305	107	166	458	377	134	539	118	271	683	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	305	107	166	458	377	134	539	118	271	683	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	76	27	42	115	94	34	135	30	68	171	12
Total Analysis Volume [veh/h]	100	305	107	166	458	377	134	539	118	271	683	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	10	33	0	14	52	0	14	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	65	55	55	65	55	55	10	23	23	10	23	23
g / C, Green / Cycle	0.59	0.50	0.50	0.59	0.50	0.50	0.09	0.21	0.21	0.09	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.06	0.09	0.24	0.21	0.07	0.18	0.17	0.08	0.18	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	858	1891	896	1071	950	900	163	399	378	320	802	380
d1, Uniform Delay [s]	9.83	15.10	14.77	10.23	18.12	17.40	49.19	42.04	41.47	49.25	41.77	35.18
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.18	0.27	0.07	1.75	1.43	9.79	5.96	4.38	6.12	2.68	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.16	0.12	0.16	0.48	0.42	0.82	0.87	0.82	0.85	0.85	0.12
d, Delay for Lane Group [s/veh]	10.11	15.29	15.04	10.29	19.87	18.83	58.98	48.00	45.85	55.37	44.45	35.33
Lane Group LOS	B	B	B	B	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.09	2.11	1.48	1.78	7.92	6.26	4.05	9.71	8.40	3.93	9.14	1.04
50th-Percentile Queue Length [ft/ln]	27.20	52.78	37.09	44.62	198.11	156.39	101.31	242.83	210.11	98.23	228.53	26.01
95th-Percentile Queue Length [veh/ln]	1.96	3.80	2.67	3.21	12.54	10.36	7.29	14.82	13.16	7.07	14.10	1.87
95th-Percentile Queue Length [ft/ln]	48.96	95.01	66.75	80.32	313.52	258.93	182.36	370.61	328.97	176.81	352.49	46.81

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	10.11	15.29	15.04	10.29	19.87	18.83	58.98	47.24	45.85	55.37	44.45	35.33
Movement LOS	B	B	B	B	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	14.22			17.89			49.02			46.98		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	33.58											
Intersection LOS	C											
Intersection V/C	0.618											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.683			2.599			2.764			2.978		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			527			873			873		
d_b, Bicycle Delay [s]	29.09			29.82			17.47			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.982			2.385			2.212			2.385		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.480

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	20	19	738	15	323	46	722	3	18	738	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	20	19	738	15	323	46	722	3	18	738	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	5	185	4	81	12	181	1	5	185	44
Total Analysis Volume [veh/h]	5	20	19	738	15	323	46	722	3	18	738	174
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	27	36	67	67	67	58	58	89
g / C, Green / Cycle	0.04	0.04	0.04	0.25	0.32	0.60	0.60	0.60	0.53	0.53	0.81
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.21	0.19	0.03	0.20	0.20	0.01	0.19	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	78	73	861	581	971	1148	1088	798	2000	1455
d1, Uniform Delay [s]	50.76	51.16	51.16	39.66	31.05	8.84	10.72	10.72	12.47	15.33	2.23
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.73	1.83	2.62	0.92	0.02	0.75	0.79	0.05	0.53	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.26	0.26	0.86	0.58	0.05	0.32	0.32	0.02	0.37	0.12
d, Delay for Lane Group [s/veh]	51.25	52.89	53.00	42.27	31.97	8.86	11.47	11.51	12.53	15.85	2.27
Lane Group LOS	D	D	D	D	C	A	B	B	B	B	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.57	0.55	9.74	7.56	0.44	4.50	4.27	0.22	5.45	0.58
50th-Percentile Queue Length [ft/ln]	3.54	14.29	13.63	243.58	189.09	10.99	112.57	106.77	5.55	136.18	14.60
95th-Percentile Queue Length [veh/ln]	0.25	1.03	0.98	14.86	12.07	0.79	7.98	7.66	0.40	9.27	1.05
95th-Percentile Queue Length [ft/ln]	6.37	25.73	24.53	371.56	301.85	19.78	199.57	191.50	9.99	231.87	26.28

**Movement, Approach, & Intersection Results**

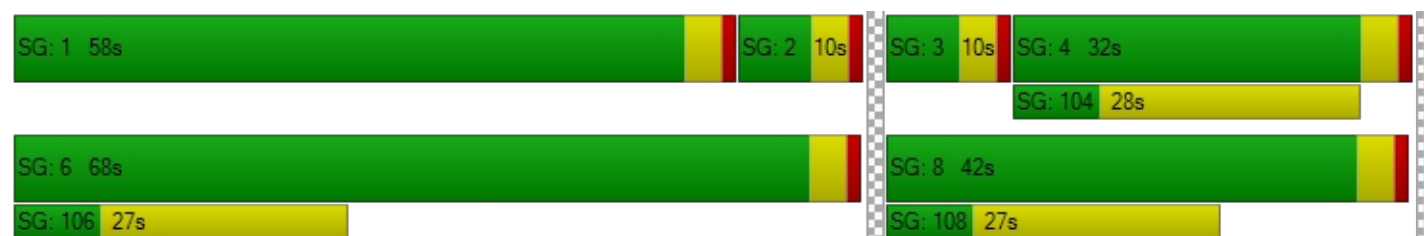
d_M, Delay for Movement [s/veh]	51.25	52.89	53.00	42.27	31.97	31.97	8.86	11.49	11.51	12.53	15.85	2.27
Movement LOS	D	D	D	D	C	C	A	B	B	B	B	A
d_A, Approach Delay [s/veh]	52.75			39.04			11.33			13.25		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.18											
Intersection LOS	C											
Intersection V/C	0.480											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.186			2.497			2.675			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.632			3.335			2.196			2.327		
Bicycle LOS	A			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	83	110	122	78	126	61	54	1177	221	89	755	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	110	122	78	126	61	54	1177	221	89	755	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	28	31	20	32	15	14	294	55	22	189	15
Total Analysis Volume [veh/h]	83	110	122	78	126	61	54	1177	221	89	755	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	61	0	10	61	0	10	29	0	10	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	10	8	8	8	82	73	73	82	74	74
g / C, Green / Cycle	0.09	0.09	0.09	0.07	0.07	0.07	0.75	0.66	0.66	0.75	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.07	0.04	0.05	0.05	0.03	0.39	0.37	0.05	0.22	0.22
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	186	173	164	230	141	134	1267	1258	1191	1052	1271	1204
d1, Uniform Delay [s]	45.98	48.22	48.74	49.27	49.72	49.57	3.56	10.24	9.97	3.63	7.77	7.72
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.66	3.81	6.48	0.86	6.10	5.46	0.01	1.98	1.89	0.16	0.71	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.45	0.63	0.74	0.34	0.70	0.66	0.04	0.58	0.56	0.08	0.33	0.33
d, Delay for Lane Group [s/veh]	47.64	52.03	55.21	50.14	55.81	55.03	3.58	12.22	11.87	3.79	8.48	8.43
Lane Group LOS	D	D	E	D	E	E	A	B	B	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.25	3.09	3.55	2.13	2.88	2.56	0.27	9.56	8.46	0.49	4.20	3.85
50th-Percentile Queue Length [ft/ln]	56.30	77.24	88.82	53.17	72.05	64.10	6.74	239.04	211.55	12.30	104.95	96.33
95th-Percentile Queue Length [veh/ln]	4.05	5.56	6.40	3.83	5.19	4.62	0.49	14.63	13.23	0.89	7.56	6.94
95th-Percentile Queue Length [ft/ln]	101.33	139.02	159.88	95.70	129.70	115.38	12.14	365.82	330.81	22.13	188.92	173.40

**Movement, Approach, & Intersection Results**

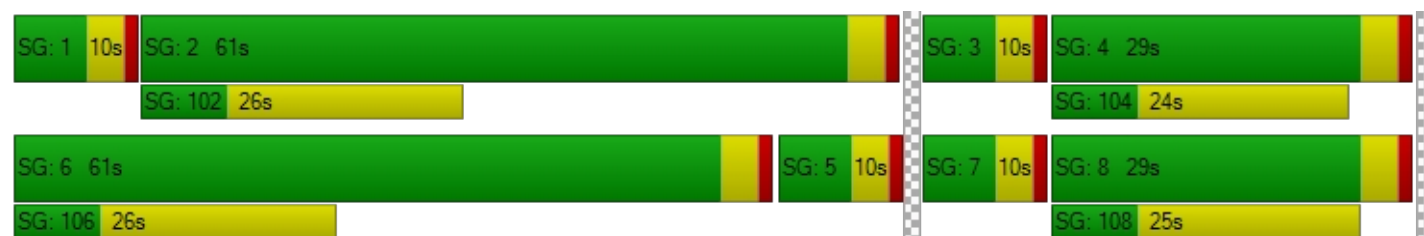
d_M, Delay for Movement [s/veh]	47.64	52.03	55.21	50.14	55.64	55.03	3.58	12.09	11.87	3.79	8.46	8.43
Movement LOS	D	D	E	D	E	E	A	B	B	A	A	A
d_A, Approach Delay [s/veh]	52.11			53.88			11.74			8.00		
Approach LOS	D			D			B			A		
d_I, Intersection Delay [s/veh]	18.72											
Intersection LOS	B											
Intersection V/C	0.598											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.542			2.313			2.861			2.759		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1036			1036			455			455		
d_b, Bicycle Delay [s]	12.77			12.77			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.079			1.778			2.758			2.306		
Bicycle LOS	B			A			C			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	32	33	71	57	49	32	21	1245	29	45	880	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	33	71	57	49	32	21	1245	29	45	880	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	8	18	14	12	8	5	311	7	11	220	9
Total Analysis Volume [veh/h]	32	33	71	57	49	32	21	1245	29	45	880	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	95	86	86	95	88	88
g / C, Green / Cycle	0.06	0.06	0.06	0.06	0.06	0.86	0.79	0.79	0.86	0.80	0.80
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.04	0.03	0.05	0.01	0.35	0.34	0.03	0.25	0.25
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	75	122	116	123	116	1510	1492	1413	1423	1520	1440
d1, Uniform Delay [s]	49.02	49.00	50.12	49.72	50.42	1.04	3.88	3.87	1.06	2.93	2.92
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.85	1.18	5.20	2.68	7.46	0.00	0.95	0.98	0.04	0.54	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.27	0.61	0.46	0.70	0.01	0.44	0.44	0.03	0.31	0.31
d, Delay for Lane Group [s/veh]	52.87	50.18	55.32	52.41	57.87	1.05	4.83	4.85	1.10	3.47	3.47
Lane Group LOS	D	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.92	0.90	2.07	1.61	2.42	0.03	4.07	3.83	0.08	2.25	2.10
50th-Percentile Queue Length [ft/ln]	22.94	22.59	51.69	40.14	60.51	0.72	101.64	95.70	1.90	56.33	52.62
95th-Percentile Queue Length [veh/ln]	1.65	1.63	3.72	2.89	4.36	0.05	7.32	6.89	0.14	4.06	3.79
95th-Percentile Queue Length [ft/ln]	41.29	40.65	93.04	72.25	108.92	1.30	182.95	172.27	3.42	101.39	94.71

**Movement, Approach, & Intersection Results**

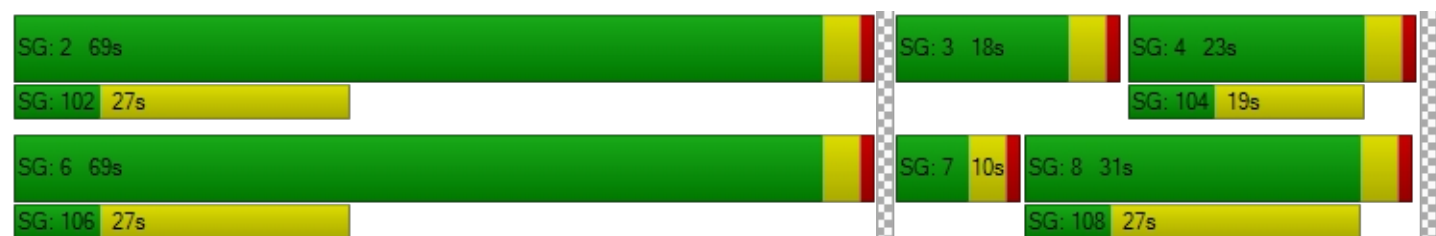
d_M, Delay for Movement [s/veh]	52.87	50.18	55.32	52.41	57.87	57.87	1.05	4.84	4.85	1.10	3.47	3.47
Movement LOS	D	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.50			55.62			4.78			3.36		
Approach LOS	D			E			A			A		
d_I, Intersection Delay [s/veh]	9.63											
Intersection LOS	A											
Intersection V/C	0.444											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.255			2.049			2.792			2.846		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.784			1.787			2.628			2.353		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	120	333	106	173	304	255	264	1093	92	126	613	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	333	106	173	304	255	264	1093	92	126	613	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	83	27	43	76	64	66	273	23	32	153	35
Total Analysis Volume [veh/h]	120	333	106	173	304	255	264	1093	92	126	613	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	40	0	10	40	40	19	48	0	12	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	44	44	6	44	81	23	35	35	8	21	21
g / C, Green / Cycle	0.06	0.40	0.40	0.06	0.40	0.74	0.20	0.32	0.32	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.06	0.05	0.08	0.14	0.08	0.29	0.05	0.07	0.16	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	141	1531	725	197	1531	1326	717	1222	579	133	726	344
d1, Uniform Delay [s]	52.50	21.54	20.88	51.64	21.36	4.46	37.68	35.59	26.72	50.79	43.01	39.06
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.96	0.33	0.42	11.92	0.29	0.07	0.32	2.55	0.13	24.77	2.81	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.22	0.15	0.88	0.20	0.19	0.37	0.89	0.16	0.94	0.84	0.40
d, Delay for Lane Group [s/veh]	65.46	21.86	21.30	63.56	21.65	4.53	37.99	38.14	26.85	75.56	45.81	39.82
Lane Group LOS	E	C	C	E	C	A	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.85	2.87	1.81	2.69	2.60	1.56	3.09	14.13	1.75	4.37	8.28	3.34
50th-Percentile Queue Length [ft/ln]	96.32	71.77	45.36	67.30	64.95	39.02	77.28	353.13	43.77	109.17	206.89	83.53
95th-Percentile Queue Length [veh/ln]	6.94	5.17	3.27	4.85	4.68	2.81	5.56	20.29	3.15	7.79	12.99	6.01
95th-Percentile Queue Length [ft/ln]	173.38	129.19	81.65	121.14	116.92	70.23	139.10	507.22	78.79	194.85	324.83	150.35

**Movement, Approach, & Intersection Results**

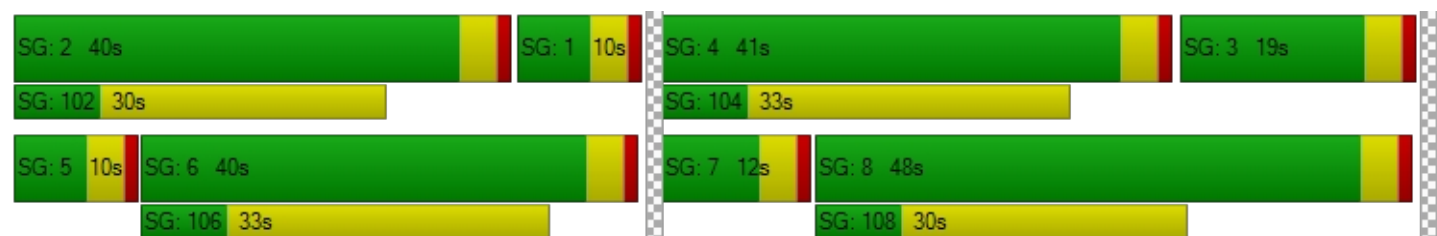
d_M, Delay for Movement [s/veh]	65.46	21.86	21.30	63.56	21.65	4.53	37.99	38.14	26.85	75.56	45.81	39.82
Movement LOS	E	C	C	E	C	A	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	31.12			25.59			37.40			49.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.88											
Intersection LOS	D											
Intersection V/C	0.590											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.638			2.808			3.114			2.828		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			655			800			673		
d_b, Bicycle Delay [s]	24.89			24.89			19.80			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.021			2.164			2.755			2.283		
Bicycle LOS	B			B			C			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	26	0	34	0	234	169	96	228	0
Total Analysis Volume [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	14	0	0	49	0	47	96	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	62	62	26	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.08	0.25	0.38	0.21	0.24
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		164	164	2148	1018	422	3177
d1, Uniform Delay [s]		48.17	49.13	13.78	16.63	41.00	1.95
k, delay calibration		0.11	0.11	0.50	0.50	0.13	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.90	10.11	0.64	3.41	9.13	0.23
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.63	0.83	0.43	0.66	0.91	0.29
d, Delay for Lane Group [s/veh]		52.07	59.24	14.42	20.04	50.14	2.17
Lane Group LOS		D	E	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.90	4.12	6.63	12.19	11.11	1.37
50th-Percentile Queue Length [ft/ln]		72.42	103.06	165.70	304.74	277.83	34.37
95th-Percentile Queue Length [veh/ln]		5.21	7.42	10.85	17.92	16.58	2.47
95th-Percentile Queue Length [ft/ln]		130.35	185.51	271.26	447.89	414.51	61.86

**Movement, Approach, & Intersection Results**

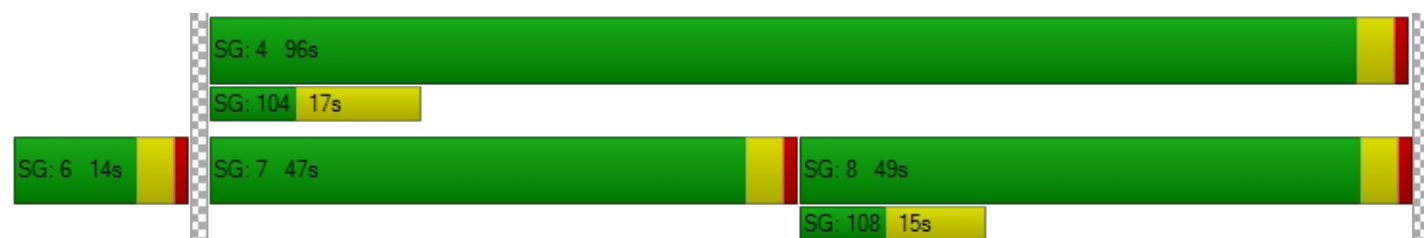
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.07	52.07	59.24	0.00	14.42	20.04	50.14	2.17	0.00
Movement LOS				D	D	E		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			56.15			16.78			16.40		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	19.61											
Intersection LOS	B											
Intersection V/C	0.746											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.466	1.841	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	182	818	1673
d_b, Bicycle Delay [s]	55.00	45.45	19.20	1.47
I_b,int, Bicycle LOS Score for Intersection	4.132	1.954	2.445	2.630
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	122	0	108	0	0	0	90	181	0	0	208	38
Total Analysis Volume [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	56	0	0	0	0	0	35	54	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23		24	79	51	51
g / C, Green / Cycle	0.21	0.21	0.21		0.22	0.72	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.17		0.20	0.19	0.26	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	371	371	371		396	2740	883	837
d1, Uniform Delay [s]	41.86	41.76	41.64		41.78	5.29	21.24	21.66
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.98	4.71	4.36		7.91	0.24	2.52	3.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.83	0.81		0.91	0.26	0.56	0.59
d, Delay for Lane Group [s/veh]	46.84	46.47	46.00		49.70	5.52	23.76	24.67
Lane Group LOS	D	D	D		D	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.52	8.38	8.21		10.23	2.61	9.55	9.81
50th-Percentile Queue Length [ft/ln]	212.95	209.62	205.20		255.80	65.30	238.70	245.14
95th-Percentile Queue Length [veh/ln]	13.30	13.13	12.91		15.48	4.70	14.62	14.94
95th-Percentile Queue Length [ft/ln]	332.61	328.34	322.66		386.94	117.54	365.39	373.52

**Movement, Approach, & Intersection Results**

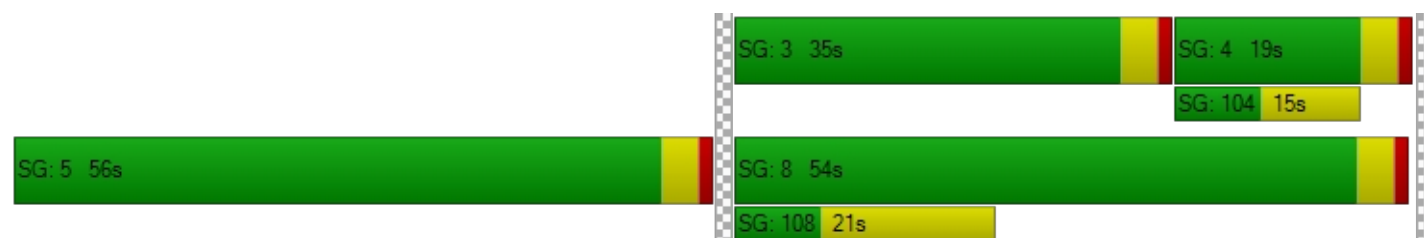
d_M, Delay for Movement [s/veh]	46.70	0.00	46.13	0.00	0.00	0.00	49.70	5.52	0.00	0.00	24.13	24.67
Movement LOS	D		D				D	A			C	C
d_A, Approach Delay [s/veh]	46.44			0.00			20.14			24.21		
Approach LOS	D			A			C			C		
d_I, Intersection Delay [s/veh]	29.58											
Intersection LOS	C											
Intersection V/C	0.723											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.248	1.928	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	909	273
d_b, Bicycle Delay [s]	55.00	55.00	16.36	41.02
I_b,int, Bicycle LOS Score for Intersection	5.649	4.132	2.452	2.371
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	4.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.312

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	26	510	17	14	941	11	12	13	31	11	14	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	510	17	14	941	11	12	13	31	11	14	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	128	4	4	235	3	3	3	8	3	4	3
Total Analysis Volume [veh/h]	26	510	17	14	941	11	12	13	31	11	14	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.14	0.14	0.01	0.26	0.26	0.03	0.02
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1537	1676	1588	1576	1676	1588	121	124
d1, Uniform Delay [s]	0.77	0.89	0.89	0.77	1.03	1.03	51.73	51.17
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.21	0.22	0.01	0.44	0.46	2.75	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.16	0.16	0.01	0.29	0.29	0.46	0.30
d, Delay for Lane Group [s/veh]	0.79	1.10	1.11	0.78	1.47	1.49	54.47	52.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.32	0.31	0.01	0.67	0.65	1.61	1.04
50th-Percentile Queue Length [ft/ln]	0.68	8.04	7.66	0.36	16.85	16.14	40.29	25.98
95th-Percentile Queue Length [veh/ln]	0.05	0.58	0.55	0.03	1.21	1.16	2.90	1.87
95th-Percentile Queue Length [ft/ln]	1.23	14.47	13.78	0.65	30.32	29.05	72.52	46.76

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.79	1.10	1.11	0.78	1.48	1.49	54.47	54.47	54.47	52.51	52.51	52.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.09			1.47			54.47			52.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.35											
Intersection LOS	A											
Intersection V/C	0.312											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.625			2.619			1.814			1.784		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.016			2.357			1.652			1.621		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.645

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	89	967	75	82	1085	173	189	394	81	115	406	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	967	75	82	1085	173	189	394	81	115	406	159
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	242	19	21	271	43	47	99	20	29	102	40
Total Analysis Volume [veh/h]	89	967	75	82	1085	173	189	394	81	115	406	159
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	54	0	13	55	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	51	42	42	51	42	42	51	41	41	51	37	37
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.38	0.38	0.46	0.37	0.37	0.46	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.05	0.25	0.04	0.05	0.35	0.33	0.11	0.10	0.05	0.06	0.11	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	336	1445	685	542	721	683	790	1398	662	798	1290	611
d1, Uniform Delay [s]	16.41	28.35	22.06	16.35	32.46	31.76	17.96	24.53	23.02	17.17	26.88	26.34
k, delay calibration	0.11	0.11	0.11	0.11	0.26	0.24	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	0.54	0.07	0.13	10.80	7.74	0.15	0.50	0.38	0.38	0.64	1.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.67	0.11	0.15	0.91	0.88	0.24	0.28	0.12	0.14	0.31	0.26
d, Delay for Lane Group [s/veh]	16.83	28.90	22.13	16.47	43.27	39.49	18.11	25.04	23.40	17.55	27.52	27.37
Lane Group LOS	B	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.29	10.52	1.27	1.17	18.41	15.89	2.91	3.71	1.46	1.76	4.05	3.19
50th-Percentile Queue Length [ft/ln]	32.34	263.06	31.75	29.26	460.19	397.26	72.77	92.66	36.55	43.94	101.13	79.79
95th-Percentile Queue Length [veh/ln]	2.33	15.84	2.29	2.11	25.44	22.43	5.24	6.67	2.63	3.16	7.28	5.74
95th-Percentile Queue Length [ft/ln]	58.21	396.06	57.15	52.68	636.09	560.70	130.98	166.79	65.80	79.09	182.03	143.61

**Movement, Approach, & Intersection Results**

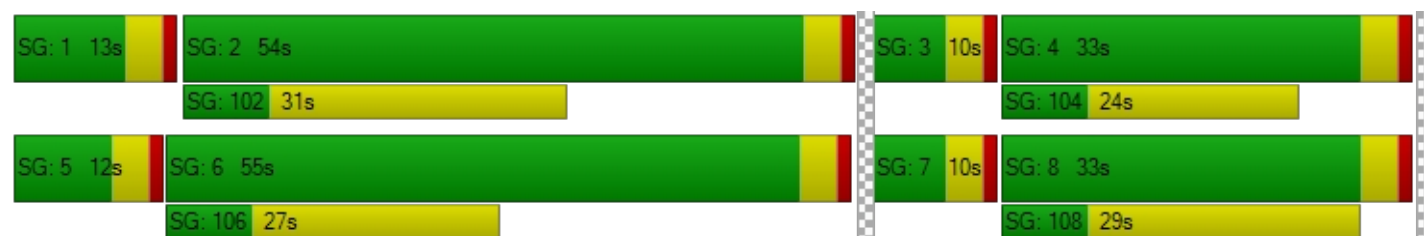
d_M, Delay for Movement [s/veh]	16.83	28.90	22.13	16.47	41.79	39.49	18.11	25.04	23.40	17.55	27.52	27.37
Movement LOS	B	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	27.50			39.94			22.87			25.80		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.76											
Intersection LOS	C											
Intersection V/C	0.645											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.918			2.923			2.729			2.709		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			927			527			527		
d_b, Bicycle Delay [s]	16.36			15.82			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.493			2.665			2.107			2.121		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.572

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	118	474	203	31	817	86	44	440	97	221	456	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	474	203	31	817	86	44	440	97	221	456	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	119	51	8	204	22	11	110	24	55	114	7
Total Analysis Volume [veh/h]	118	474	203	31	817	86	44	440	97	221	456	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	58	0	12	50	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	31	31	31	4	46	46	9	51	51
g / C, Green / Cycle	0.16	0.16	0.16	0.28	0.28	0.28	0.04	0.41	0.41	0.09	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.07	0.12	0.11	0.02	0.25	0.24	0.02	0.12	0.05	0.06	0.12	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	270	595	282	489	529	501	74	1572	745	299	1740	824
d1, Uniform Delay [s]	41.90	44.73	44.13	29.18	38.14	37.71	51.86	21.40	20.00	49.15	18.39	16.43
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.11	2.49	3.45	0.05	5.45	4.50	7.29	0.44	0.36	3.58	0.37	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.80	0.72	0.06	0.89	0.86	0.59	0.28	0.13	0.74	0.26	0.03
d, Delay for Lane Group [s/veh]	43.01	47.22	47.58	29.23	43.58	42.22	59.15	21.84	20.36	52.73	18.75	16.50
Lane Group LOS	D	D	D	C	D	D	E	C	C	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.98	6.41	5.51	0.61	12.83	11.52	1.34	3.83	1.61	3.11	3.63	0.39
50th-Percentile Queue Length [ft/ln]	74.39	160.19	137.77	15.31	320.78	287.90	33.57	95.78	40.34	77.68	90.67	9.78
95th-Percentile Queue Length [veh/ln]	5.36	10.56	9.36	1.10	18.71	17.08	2.42	6.90	2.90	5.59	6.53	0.70
95th-Percentile Queue Length [ft/ln]	133.90	263.97	234.02	27.56	467.64	427.03	60.43	172.41	72.61	139.83	163.20	17.61

**Movement, Approach, & Intersection Results**

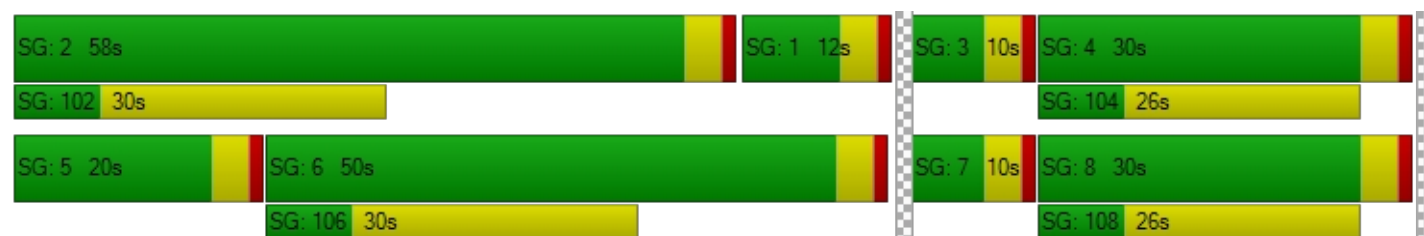
d_M, Delay for Movement [s/veh]	43.01	47.22	47.58	29.23	43.00	42.22	59.15	21.84	20.36	52.73	18.75	16.50
Movement LOS	D	D	D	C	D	D	E	C	C	D	B	B
d_A, Approach Delay [s/veh]	46.69			42.47			24.42			29.33		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	37.04											
Intersection LOS	D											
Intersection V/C	0.572											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.776			2.598			2.674			2.828		
Crosswalk LOS	C			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	982			836			473			473		
d_b, Bicycle Delay [s]	14.25			18.62			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.215			2.330			2.039			2.140		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	66	1217	36	17	1403	26	44	98	90	75	91	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	1217	36	17	1403	26	44	98	90	75	91	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	304	9	4	351	7	11	25	23	19	23	6
Total Analysis Volume [veh/h]	66	1217	36	17	1403	26	44	98	90	75	91	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	80	0	0	80	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	86	86	86	86	86	86	16	16	16
g / C, Green / Cycle	0.78	0.78	0.78	0.78	0.78	0.78	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.34	0.01	0.39	0.39	0.13	0.04	0.06
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1173	1483	1405	1219	1483	1405	303	75	264
d1, Uniform Delay [s]	2.74	4.00	3.98	2.66	4.31	4.29	45.86	41.69	42.68
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.93	0.97	0.02	1.19	1.24	4.06	48.64	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.44	0.43	0.01	0.50	0.49	0.77	1.00	0.44
d, Delay for Lane Group [s/veh]	2.83	4.93	4.95	2.69	5.49	5.53	49.92	90.32	43.81
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.29	4.12	3.87	0.07	5.07	4.79	6.51	2.82	2.93
50th-Percentile Queue Length [ft/ln]	7.29	103.12	96.84	1.82	126.83	119.79	162.64	70.53	73.16
95th-Percentile Queue Length [veh/ln]	0.52	7.42	6.97	0.13	8.77	8.38	10.69	5.08	5.27
95th-Percentile Queue Length [ft/ln]	13.12	185.62	174.31	3.27	219.18	209.54	267.22	126.95	131.70

**Movement, Approach, & Intersection Results**

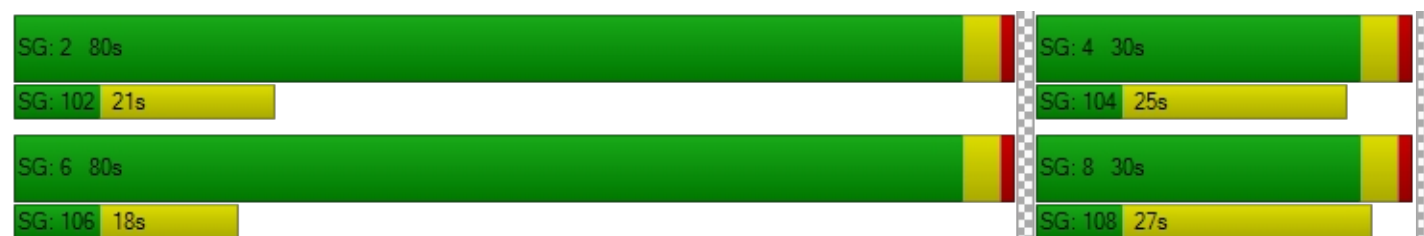
d_M, Delay for Movement [s/veh]	2.83	4.94	4.95	2.69	5.51	5.53	49.92	49.92	49.92	90.32	43.81	43.81
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.84			5.48			49.92			62.17		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.83											
Intersection LOS	B											
Intersection V/C	0.557											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.979			2.905			2.021			2.085		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1382			1382			473			473		
d_b, Bicycle Delay [s]	5.25			5.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.648			2.753			1.942			1.873		
Bicycle LOS	B			C			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	105	824	65	60	1038	54	42	44	98	106	39	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	824	65	60	1038	54	42	44	98	106	39	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	206	16	15	260	14	11	11	25	27	10	12
Total Analysis Volume [veh/h]	105	824	65	60	1038	54	42	44	98	106	39	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.24	0.24	0.03	0.30	0.29	0.10	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1313	1524	1444	1350	1524	1444	265	276
d1, Uniform Delay [s]	2.28	2.84	2.82	2.22	3.06	3.04	46.84	47.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.51	0.52	0.06	0.69	0.71	3.25	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.30	0.30	0.04	0.37	0.36	0.69	0.70
d, Delay for Lane Group [s/veh]	2.40	3.35	3.34	2.28	3.75	3.75	50.09	50.23
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.40	2.15	1.98	0.22	2.84	2.64	5.12	5.36
50th-Percentile Queue Length [ft/ln]	9.90	53.72	49.41	5.49	70.97	65.96	128.06	134.07
95th-Percentile Queue Length [veh/ln]	0.71	3.87	3.56	0.39	5.11	4.75	8.83	9.16
95th-Percentile Queue Length [ft/ln]	17.81	96.70	88.93	9.87	127.74	118.72	220.85	229.02

**Movement, Approach, & Intersection Results**

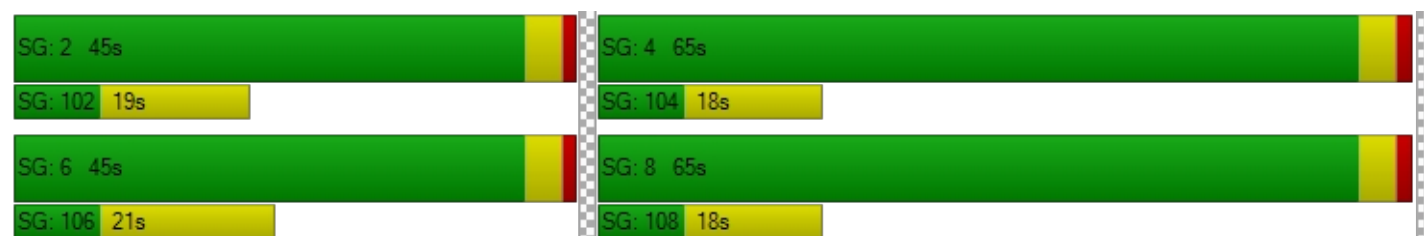
d_M, Delay for Movement [s/veh]	2.40	3.35	3.34	2.28	3.75	3.75	50.09	50.09	50.09	50.23	50.23	50.23
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	3.25			3.68			50.09			50.23		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.44											
Intersection LOS	B											
Intersection V/C	0.436											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.896			2.772			2.060			1.986		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.380			2.510			1.863			1.876		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	39.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	233	1188	200	206	1314	165	241	702	262	227	834	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	233	1188	200	206	1314	165	241	702	262	227	834	201
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	297	50	52	329	41	60	176	66	57	209	50
Total Analysis Volume [veh/h]	233	1188	200	206	1314	165	241	702	262	227	834	201
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	11	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	38	38	7	37	37	16	35	35	14	33	33
g / C, Green / Cycle	0.07	0.34	0.34	0.06	0.33	0.33	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.31	0.11	0.06	0.32	0.15	0.13	0.12	0.15	0.13	0.15	0.11
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1301	616	223	1267	600	268	1806	570	237	1707	539
d1, Uniform Delay [s]	50.66	34.60	26.76	51.24	35.83	28.80	45.99	29.27	30.04	47.46	31.62	30.39
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.42	2.92	0.30	14.87	5.03	0.54	10.44	0.63	2.65	18.81	1.00	1.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.92	0.91	0.32	0.92	0.95	0.45	0.90	0.39	0.46	0.96	0.49	0.37
d, Delay for Lane Group [s/veh]	63.08	37.52	27.06	66.11	40.86	29.33	56.43	29.91	32.69	66.27	32.62	32.36
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.62	15.40	3.92	3.28	16.35	5.69	7.21	4.90	5.93	7.39	6.19	4.48
50th-Percentile Queue Length [ft/ln]	90.39	384.92	98.08	81.90	408.76	142.22	180.33	122.54	148.27	184.66	154.70	112.12
95th-Percentile Queue Length [veh/ln]	6.51	21.83	7.06	5.90	22.98	9.60	11.62	8.53	9.92	11.84	10.27	7.96
95th-Percentile Queue Length [ft/ln]	162.70	545.80	176.55	147.41	574.54	240.01	290.44	213.32	248.12	296.09	256.69	198.94

**Movement, Approach, & Intersection Results**

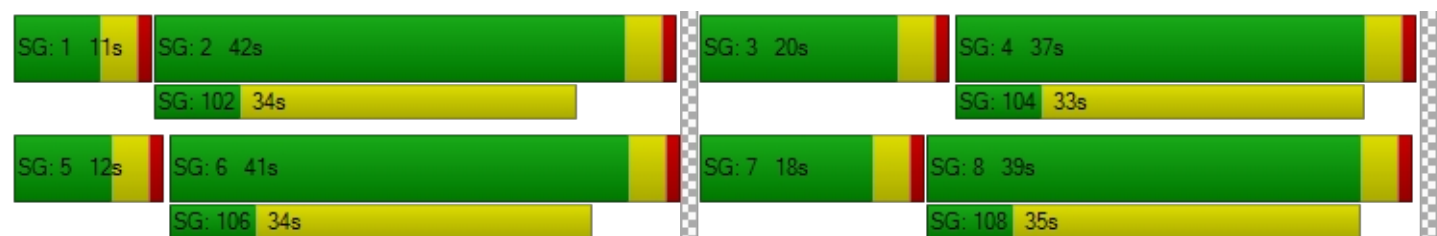
d_M, Delay for Movement [s/veh]	63.08	37.52	27.06	66.11	39.92	29.33	56.43	29.91	32.69	66.27	32.62	32.36
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	39.90			42.08			35.82			38.63		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.41											
Intersection LOS	D											
Intersection V/C	0.778											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.152			3.065			3.032			3.024		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			673			636			600		
d_b, Bicycle Delay [s]	23.56			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.897			2.486			2.222			2.254		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	301	839	91	171	1037	150	170	596	231	122	502	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	301	839	91	171	1037	150	170	596	231	122	502	119
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	210	23	43	259	38	43	149	58	31	126	30
Total Analysis Volume [veh/h]	301	839	91	171	1037	150	170	596	231	122	502	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	56	0	10	56	0	10	34	0	10	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	29	29	45	35	35	12	47	47	6	41	41
g / C, Green / Cycle	0.41	0.26	0.26	0.41	0.31	0.31	0.11	0.43	0.43	0.05	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.17	0.22	0.05	0.10	0.27	0.08	0.09	0.16	0.13	0.03	0.17	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	270	988	468	357	1197	567	203	1635	774	189	705	668
d1, Uniform Delay [s]	22.80	38.68	31.74	21.41	35.52	28.17	47.83	21.20	20.51	51.03	26.32	25.97
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	62.72	2.14	0.20	1.00	2.03	0.25	8.72	0.63	0.99	3.64	2.21	2.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.11	0.85	0.19	0.48	0.87	0.26	0.84	0.36	0.30	0.64	0.47	0.44
d, Delay for Lane Group [s/veh]	85.52	40.82	31.94	22.41	37.55	28.42	56.55	21.83	21.49	54.67	28.53	28.04
Lane Group LOS	F	D	C	C	D	C	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.56	10.92	1.92	2.98	13.22	2.99	5.04	5.27	4.06	1.74	6.92	6.07
50th-Percentile Queue Length [ft/ln]	239.10	273.06	47.96	74.61	330.46	74.86	126.07	131.74	101.40	43.54	173.11	151.69
95th-Percentile Queue Length [veh/ln]	15.61	16.34	3.45	5.37	19.18	5.39	8.73	9.03	7.30	3.14	11.24	10.11
95th-Percentile Queue Length [ft/ln]	390.33	408.56	86.32	134.30	479.52	134.75	218.14	225.86	182.52	78.38	281.00	252.68

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	85.52	40.82	31.94	22.41	37.55	28.42	56.55	21.83	21.49	54.67	28.36	28.04
Movement LOS	F	D	C	C	D	C	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	51.09			34.64			27.67			32.63		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	37.37											
Intersection LOS	D											
Intersection V/C	0.760											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.888			2.866			2.929			2.959		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			945			545			545		
d_b, Bicycle Delay [s]	15.29			15.29			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.575			2.680			2.108			2.173		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.807

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	412	0	0	377	184	0	0	0	55	126	118
Total Analysis Volume [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	62	52	52		30	30	30
g / C, Green / Cycle	0.06	0.62	0.52	0.52		0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.39	0.42		0.12	0.13	0.26
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3522	1975	935		544	1148	544
d1, Uniform Delay [s]	45.81	10.26	19.03	19.74		27.73	28.07	33.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.45	2.77	7.11		0.48	0.26	4.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.47	0.76	0.80		0.40	0.44	0.87
d, Delay for Lane Group [s/veh]	48.11	10.71	21.80	26.84		28.21	28.33	37.48
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	6.11	13.64	15.21		4.19	4.83	11.26
50th-Percentile Queue Length [ft/ln]	35.31	152.73	340.99	380.17		104.68	120.64	281.47
95th-Percentile Queue Length [veh/ln]	2.54	10.16	19.70	21.60		7.54	8.43	16.76
95th-Percentile Queue Length [ft/ln]	63.56	254.07	492.40	540.06		188.43	210.71	419.05

**Movement, Approach, & Intersection Results**

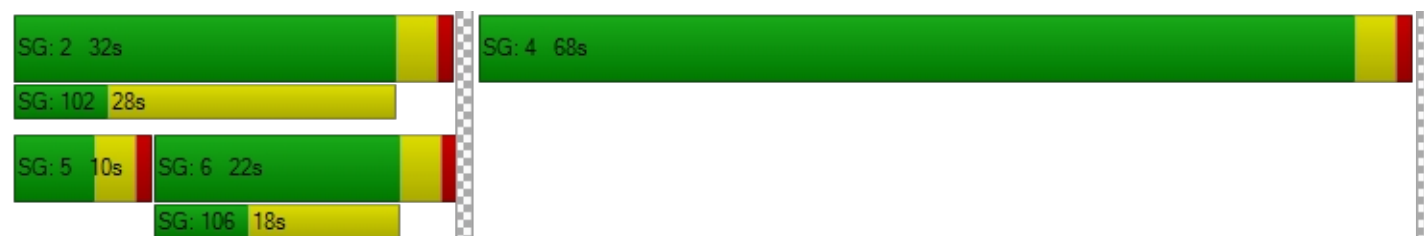
d_M, Delay for Movement [s/veh]	48.11	10.71	0.00	0.00	21.84	26.84	0.00	0.00	0.00	28.21	28.33	37.48
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	13.09			23.48			0.00			31.93		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	21.91											
Intersection LOS	C											
Intersection V/C	0.807											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.377			2.427		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.527			2.793			4.132			2.545		
Bicycle LOS	B			C			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.827

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	180	0	0	295	107	0	0	0	43	135	173
Total Analysis Volume [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.28	0.30		0.20	0.19	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2837	1510	715		760	802	760
d1, Uniform Delay [s]	46.31	14.44	25.29	25.85		20.85	20.48	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.18
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.03	0.21	2.84	7.05		0.46	0.38	7.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.71	0.75		0.47	0.44	0.91
d, Delay for Lane Group [s/veh]	57.34	14.65	28.13	32.90		21.31	20.85	34.15
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.38	3.09	10.92	11.95		6.00	5.77	16.23
50th-Percentile Queue Length [ft/ln]	59.49	77.19	272.93	298.79		150.12	144.14	405.65
95th-Percentile Queue Length [veh/ln]	4.28	5.56	16.34	17.62		10.02	9.70	22.83
95th-Percentile Queue Length [ft/ln]	107.08	138.95	408.40	440.53		250.59	242.58	570.80

**Movement, Approach, & Intersection Results**

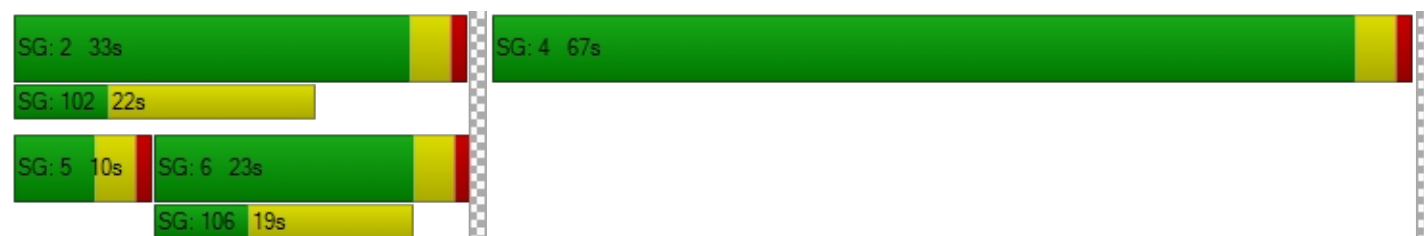
d_M, Delay for Movement [s/veh]	57.34	14.65	0.00	0.00	28.57	32.90	0.00	0.00	0.00	21.31	21.01	34.15
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	19.12			29.72			0.00			27.52		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	26.68											
Intersection LOS	C											
Intersection V/C	0.827											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.232	2.400
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	2.001	2.443	4.132	2.715
Bicycle LOS	B	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	260	66	123	303	0	175	61	37	0	0	0
Total Analysis Volume [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	47	47	17	68	24	24	24	
g / C, Green / Cycle	0.47	0.47	0.17	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.21	0.20	0.13	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2700	853	588	3886	834	453	429	
d1, Uniform Delay [s]	16.94	16.21	40.26	6.44	36.23	33.28	31.59	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.93	3.21	0.21	2.32	1.00	0.47	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.38	0.31	0.84	0.31	0.84	0.54	0.34	
d, Delay for Lane Group [s/veh]	17.36	17.14	43.48	6.65	38.55	34.28	32.06	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.07	3.82	6.04	3.14	8.24	5.24	2.98	
50th-Percentile Queue Length [ft/ln]	126.83	95.47	150.99	78.39	205.88	131.04	74.54	
95th-Percentile Queue Length [veh/ln]	8.77	6.87	10.07	5.64	12.94	9.00	5.37	
95th-Percentile Queue Length [ft/ln]	219.18	171.84	251.75	141.11	323.53	224.91	134.17	

**Movement, Approach, & Intersection Results**

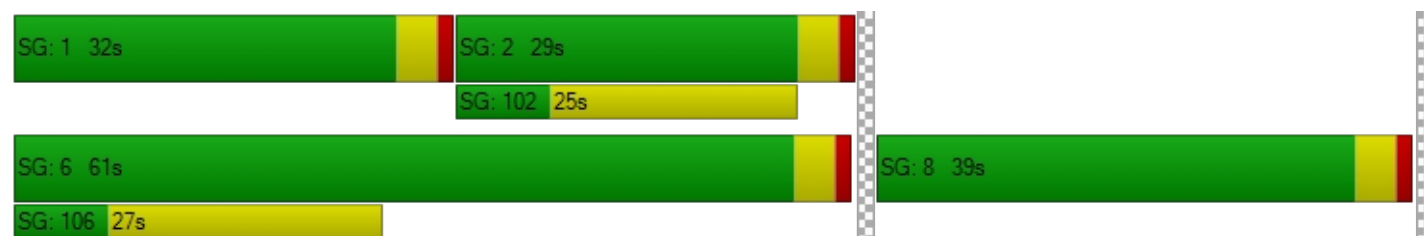
d_M, Delay for Movement [s/veh]	0.00	17.36	17.14	43.48	6.65	0.00	38.55	34.28	32.06	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	17.31			17.26			36.72			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.45											
Intersection LOS	C											
Intersection V/C	0.593											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.401			2.206		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.497			3.356			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	146	45	157	195	0	54	187	15	0	0	0
Total Analysis Volume [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	27	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	20	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.20	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.18	0.20	0.27	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1423	674	709	2345	545	575	545	
d1, Uniform Delay [s]	22.58	22.78	38.76	9.22	33.29	32.45	25.11	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.70	1.61	4.00	0.38	7.39	3.65	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.38	0.89	0.33	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	23.28	24.39	42.76	9.60	40.68	36.10	25.20	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.39	4.59	7.78	3.92	12.09	11.08	1.00	
50th-Percentile Queue Length [ft/ln]	109.82	114.80	194.54	97.88	302.27	277.06	25.02	
95th-Percentile Queue Length [veh/ln]	7.83	8.11	12.36	7.05	17.79	16.54	1.80	
95th-Percentile Queue Length [ft/ln]	195.75	202.66	308.91	176.19	444.84	413.54	45.03	

**Movement, Approach, & Intersection Results**

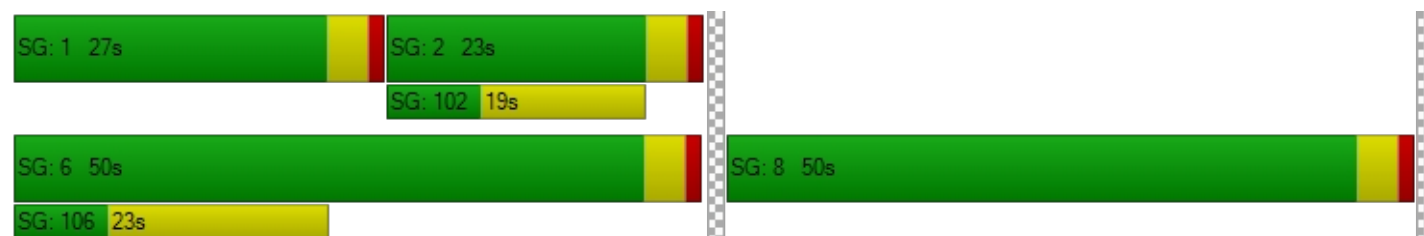
d_M, Delay for Movement [s/veh]	0.00	23.43	24.39	42.76	9.60	0.00	40.68	37.76	25.20	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	23.65			24.42			37.66			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.47											
Intersection LOS	C											
Intersection V/C	0.672											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.277			2.479		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			920			920			0		
d_b, Bicycle Delay [s]	32.81			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.979			2.720			2.402			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.319

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	249	258	37	6	444
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	249	258	37	6	444
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	62	65	9	2	111
Total Analysis Volume [veh/h]	0	249	258	37	6	444
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.32	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	11.76	0.00	0.00	7.86	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.38	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	34.41	0.00	0.00	0.36	0.00
d_A, Approach Delay [s/veh]	11.76		0.00		0.10	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.99					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.409

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	438	29	5	436	0	2	2	7	420	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	438	29	5	436	0	2	2	7	420	0	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	110	7	1	109	0	1	1	2	105	0	3
Total Analysis Volume [veh/h]	0	438	29	5	436	0	2	2	7	420	0	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	46	0	10	56	0	0	54	0	54	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	69	69	74	74	28	28	28	28
g / C, Green / Cycle	0.63	0.63	0.68	0.68	0.25	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.13	0.00	0.11	0.00	0.01	0.23	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1198	1135	1206	2567	485	486	478	453
d1, Uniform Delay [s]	8.56	8.63	5.80	6.54	30.82	30.94	40.16	30.98
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.36	0.41	0.00	0.14	0.00	0.02	5.37	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.21	0.00	0.17	0.00	0.02	0.88	0.02
d, Delay for Lane Group [s/veh]	8.93	9.04	5.81	6.68	30.83	30.96	45.53	31.00
Lane Group LOS	A	A	A	A	C	C	D	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.36	2.38	0.04	1.78	0.04	0.18	11.65	0.22
50th-Percentile Queue Length [ft/ln]	58.89	59.53	0.89	44.56	1.01	4.57	291.37	5.59
95th-Percentile Queue Length [veh/ln]	4.24	4.29	0.06	3.21	0.07	0.33	17.25	0.40
95th-Percentile Queue Length [ft/ln]	105.99	107.16	1.61	80.21	1.82	8.22	431.35	10.07

**Movement, Approach, & Intersection Results**

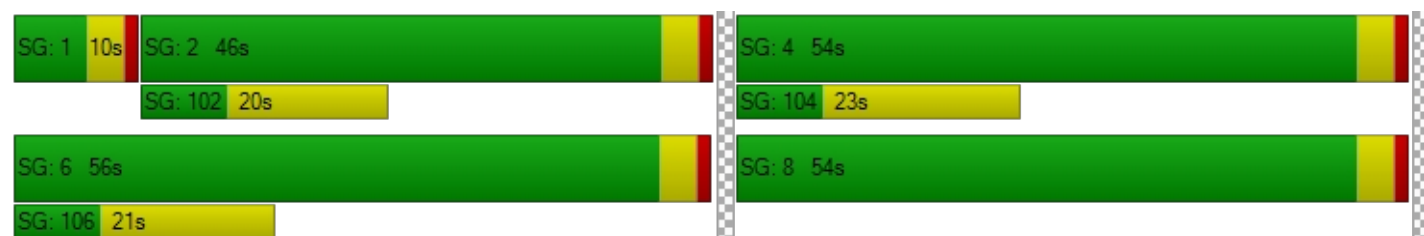
d_M, Delay for Movement [s/veh]	0.00	8.98	9.04	5.81	6.68	0.00	30.83	30.96	30.96	45.53	0.00	31.00
Movement LOS		A	A	A	A		C	C	C	D		C
d_A, Approach Delay [s/veh]	8.98			6.67			30.93			45.16		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	19.95											
Intersection LOS	B											
Intersection V/C	0.409											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.486			1.730			2.106		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			945			909			0		
d_b, Bicycle Delay [s]	21.02			15.29			16.36			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.945			1.923			1.578			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	76.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.373

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	52	180	471	0	200	397
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	180	471	0	200	397
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	45	118	0	50	99
Total Analysis Volume [veh/h]	52	180	471	0	200	397
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.37	0.67
d_M, Delay for Movement [s/veh]	8.47	0.00	0.00	0.00	76.56	75.92
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	16.58	16.58
95th-Percentile Queue Length [ft/ln]	3.75	0.00	0.00	0.00	414.44	414.44
d_A, Approach Delay [s/veh]	1.90		0.00		76.13	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	35.30					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	89.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	79	227	832	0	0	381
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	227	832	0	0	381
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	57	208	0	0	95
Total Analysis Volume [veh/h]	79	227	832	0	0	381
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.10	0.00	0.01	0.00	0.00	1.03
d_M, Delay for Movement [s/veh]	9.99	0.00	0.00	0.00	89.86	89.78
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.33	0.00	0.00	0.00	12.73	12.73
95th-Percentile Queue Length [ft/ln]	8.18	0.00	0.00	0.00	318.13	318.13
d_A, Approach Delay [s/veh]	2.58		0.00		89.78	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	23.04					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	290	12	24	1193	11	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	290	12	24	1193	11	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	3	6	298	3	5
Total Analysis Volume [veh/h]	290	12	24	1193	11	21
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.01	0.04	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.92	0.00	20.13	10.48
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.23	0.23
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.46	0.00	5.84	5.84
d_A, Approach Delay [s/veh]	0.00		0.16		13.80	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.41					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.124

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	382	59	0	441	5	0	0	12	0	0	97
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	382	59	0	441	5	0	0	12	0	0	97
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	96	15	0	110	1	0	0	3	0	0	24
Total Analysis Volume [veh/h]	6	382	59	0	441	5	0	0	12	0	0	97
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.12
d_M, Delay for Movement [s/veh]	8.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.68	0.00	0.00	10.24
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.42
95th-Percentile Queue Length [ft/ln]	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	10.55
d_A, Approach Delay [s/veh]	0.11			0.00			9.68			10.24		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	1.16											
Intersection LOS	B											







*APPENDIX F-VII*

**YEAR 2020 CUMULATIVE PLUS PROJECT WITH IMPROVEMENTS  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	49	13	16	56	7	4	45	21	41	61	16
Total Analysis Volume [veh/h]	205	195	53	62	223	27	16	180	84	164	242	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	60	60	60	60	60	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	8	8	8	8	8	8
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.13	0.13	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.09	0.13	0.03	0.03	0.14	0.01	0.09	0.05	0.09	0.08	0.08
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1292	1388	1319	1299	1319	168	255	242	149	255	242
d1, Uniform Delay [s]	2.37	2.46	2.21	2.22	2.49	22.70	24.86	23.60	24.53	24.57	24.46
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.26	0.06	0.07	0.32	0.24	3.57	0.86	65.16	2.54	2.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.17	0.04	0.05	0.19	0.09	0.71	0.35	1.10	0.63	0.60
d, Delay for Lane Group [s/veh]	2.58	2.72	2.27	2.29	2.81	22.95	28.43	24.46	89.70	27.12	26.79
Lane Group LOS	A	A	A	A	A	C	C	C	F	C	C
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.37	0.51	0.11	0.13	0.57	0.20	2.55	1.08	4.58	2.20	1.96
50th-Percentile Queue Length [ft/ln]	9.18	12.78	2.65	3.13	14.23	4.95	63.81	26.91	114.40	55.09	49.11
95th-Percentile Queue Length [veh/ln]	0.66	0.92	0.19	0.23	1.02	0.36	4.59	1.94	8.24	3.97	3.54
95th-Percentile Queue Length [ft/ln]	16.52	23.01	4.77	5.63	25.62	8.91	114.87	48.45	205.91	99.17	88.40

**Movement, Approach, & Intersection Results**

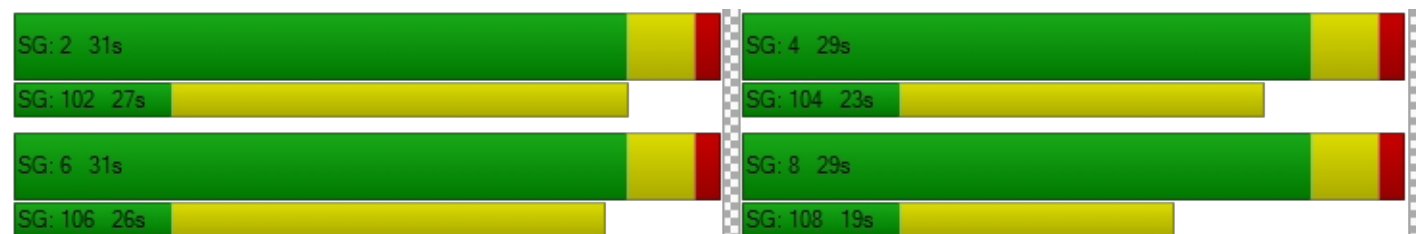
d_M, Delay for Movement [s/veh]	2.58	2.72	2.27	2.29	2.81	2.81	22.95	28.43	24.46	89.70	27.01	26.79
Movement LOS	A	A	A	A	A	A	C	C	C	F	C	C
d_A, Approach Delay [s/veh]	2.61			2.71			26.92			48.95		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	21.46											
Intersection LOS	C											
Intersection V/C	0.270											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	20.01			20.01			20.01			20.01		
I_p,int, Pedestrian LOS Score for Intersection	2.567			2.131			2.759			2.383		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	900			900			833			833		
d_b, Bicycle Delay [s]	9.08			9.08			10.21			10.21		
I_b,int, Bicycle LOS Score for Intersection	2.307			2.074			2.022			1.946		
Bicycle LOS	B			B			B			A		

**Sequence**




Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	16.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	52	180	471	0	200	397
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	180	471	0	200	397
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	45	118	0	50	99
Total Analysis Volume [veh/h]	52	180	471	0	200	397
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	23
g / C, Green / Cycle	0.49	0.49	0.49	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.26	0.33
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	621	933	884	677
d1, Uniform Delay [s]	8.03	8.61	10.56	17.55
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	0.46	2.30	4.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.19	0.53	0.88
d, Delay for Lane Group [s/veh]	8.29	9.07	12.86	21.55
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.35	1.23	4.14	7.50
50th-Percentile Queue Length [ft/ln]	8.64	30.84	103.45	187.45
95th-Percentile Queue Length [veh/ln]	0.62	2.22	7.45	11.99
95th-Percentile Queue Length [ft/ln]	15.56	55.50	186.21	299.72



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	8.29	9.07	12.86	12.86	21.55	21.55
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	8.90		12.86		21.55	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	16.14					
Intersection LOS	B					
Intersection V/C	0.684					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.515	4.910	5.117
Bicycle LOS	E	E	F

**Sequence**




Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	79	227	832	0	0	381
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	227	832	0	0	381
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	57	208	0	0	95
Total Analysis Volume [veh/h]	79	227	832	0	0	381
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	15
g / C, Green / Cycle	0.61	0.61	0.61	0.25
(v / s)_i Volume / Saturation Flow Rate	0.04	0.12	0.46	0.21
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	554	1165	1104	457
d1, Uniform Delay [s]	4.70	5.11	8.36	21.24
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.54	0.37	4.78	4.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.19	0.75	0.83
d, Delay for Lane Group [s/veh]	5.24	5.48	13.14	25.31
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.38	1.04	6.97	5.15
50th-Percentile Queue Length [ft/ln]	9.42	25.95	174.29	128.65
95th-Percentile Queue Length [veh/ln]	0.68	1.87	11.30	8.87
95th-Percentile Queue Length [ft/ln]	16.96	46.72	282.54	221.66

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.24	5.48	13.14	13.14	25.31	25.31
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	5.42		13.14		25.31	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	14.64					
Intersection LOS	B					
Intersection V/C	0.777					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.637	5.505	4.761
Bicycle LOS	E	F	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## APPENDIX G

### YEAR 2030 BUILDOUT TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

*APPENDIX G-1*





**YEAR 2030 BUILDOUT WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**

### Intersection Level Of Service Report

#### Intersection 1: Harbor Boulevard at Bastanchury Road

Control Type:	Signalized	Delay (sec / veh):	89.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.058

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	354	1768	267	387	1562	467	362	1491	271	266	1317	366
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	354	1768	267	387	1562	467	362	1491	271	266	1317	366
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	442	67	97	391	117	91	373	68	67	329	92
Total Analysis Volume [veh/h]	354	1768	267	387	1562	467	362	1491	271	266	1317	366
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	10	39	0	16	48	0	10	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	42	42	6	39	39	12	40	40	6	34	34
g / C, Green / Cycle	0.08	0.38	0.38	0.06	0.36	0.36	0.11	0.36	0.36	0.06	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.10	0.31	0.15	0.11	0.36	0.37	0.20	0.31	0.32	0.08	0.23	0.20
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	291	2184	690	197	1353	641	198	1366	647	197	1741	550
d1, Uniform Delay [s]	50.52	30.40	24.62	52.01	35.48	35.48	49.03	32.80	33.41	52.01	34.57	33.37
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.26	0.11	0.33	0.11	0.11	0.16
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	104.34	3.37	1.64	440.19	25.90	46.94	381.61	1.76	12.74	166.37	0.69	2.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.22	0.81	0.39	1.97	1.01	1.04	1.83	0.86	0.90	1.35	0.76	0.67
d, Delay for Lane Group [s/veh]	154.86	33.77	26.26	492.20	61.38	82.42	430.64	34.55	46.16	218.38	35.26	35.41
Lane Group LOS	F	C	C	F	F	F	F	C	D	F	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.21	14.33	5.32	14.72	22.52	25.08	26.45	14.60	16.63	7.25	10.58	8.73
50th-Percentile Queue Length [ft/ln]	205.35	358.18	133.03	368.04	563.06	627.07	661.15	365.08	415.68	181.20	264.45	218.35
95th-Percentile Queue Length [veh/ln]	13.77	20.53	9.10	24.29	30.43	34.27	41.84	20.87	23.31	12.62	15.91	13.58
95th-Percentile Queue Length [ft/ln]	344.24	513.37	227.61	607.26	760.81	856.68	1046.04	521.76	582.86	315.47	397.80	339.52

**Movement, Approach, & Intersection Results**

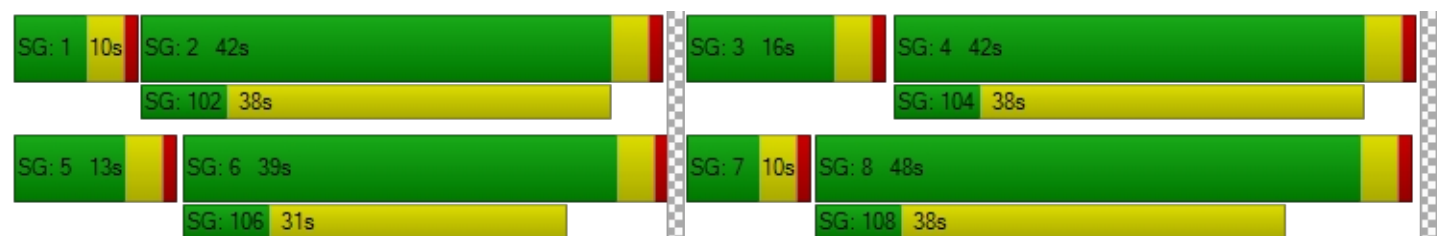
d_M, Delay for Movement [s/veh]	154.86	33.77	26.26	492.20	64.09	82.42	430.64	36.97	46.16	218.38	35.26	35.41
Movement LOS	F	C	C	F	E	F	F	D	D	F	D	D
d_A, Approach Delay [s/veh]	50.88			136.21			105.24			60.28		
Approach LOS	D			F			F			E		
d_I, Intersection Delay [s/veh]	89.17											
Intersection LOS	F											
Intersection V/C	1.058											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.345			3.334			3.197			3.302		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			800			691		
d_b, Bicycle Delay [s]	23.56			25.57			19.80			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.874			2.888			2.728			2.632		
Bicycle LOS	C			C			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.896

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	12	1930	718	108	2012	59	96	194	15	668	117	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	1930	718	108	2012	59	96	194	15	668	117	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	483	180	27	503	15	24	49	4	167	29	0
Total Analysis Volume [veh/h]	12	1930	718	108	2012	59	96	194	15	668	117	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	51	0	12	53	0	0	13	0	0	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	47	8	53	53	12	12	12	26	26
g / C, Green / Cycle	0.02	0.43	0.07	0.48	0.48	0.11	0.11	0.11	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.34	0.06	0.44	0.23	0.05	0.10	0.01	0.22	0.22
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	31	2443	132	1841	872	202	213	202	434	434
d1, Uniform Delay [s]	53.50	27.16	50.29	26.03	18.89	45.84	48.33	43.76	40.49	40.60
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.30	0.31
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	2.69	11.82	7.83	1.79	1.74	13.98	0.16	16.58	17.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.79	0.82	0.90	0.47	0.48	0.91	0.07	0.90	0.91
d, Delay for Lane Group [s/veh]	61.13	29.86	62.12	33.86	20.68	47.58	62.31	43.91	57.07	58.34
Lane Group LOS	E	C	E	C	C	D	E	D	E	E
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.39	14.80	3.36	21.09	7.19	2.55	6.06	0.38	12.14	12.40
50th-Percentile Queue Length [ft/ln]	9.85	370.11	83.90	527.19	179.85	63.87	151.55	9.38	303.44	309.90
95th-Percentile Queue Length [veh/ln]	0.71	21.11	6.04	28.62	11.59	4.60	10.10	0.68	17.85	18.17
95th-Percentile Queue Length [ft/ln]	17.73	527.86	151.02	715.47	289.82	114.97	252.50	16.89	446.28	454.25

**Movement, Approach, & Intersection Results**

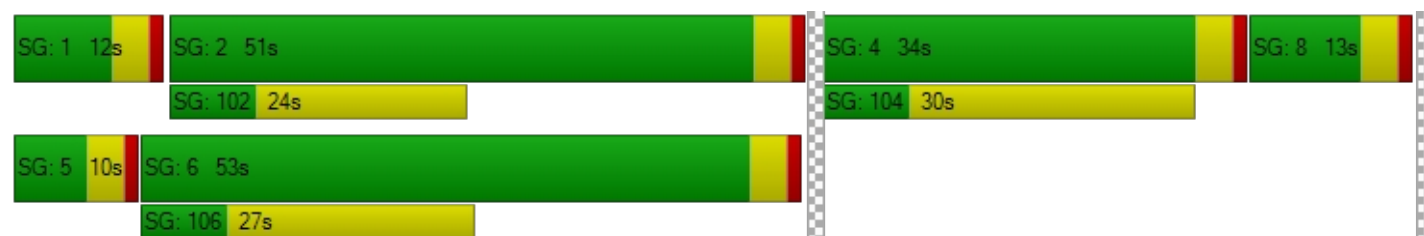
d_M, Delay for Movement [s/veh]	61.13	29.86	0.00	62.12	31.58	20.68	47.58	62.31	43.91	57.60	58.34	0.00
Movement LOS	E	C		E	C	C	D	E	D	E	E	
d_A, Approach Delay [s/veh]	30.05			32.80			56.77			57.71		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	36.93											
Intersection LOS	D											
Intersection V/C	0.896											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.189	2.261	2.303
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	855	891	164	545
d_b, Bicycle Delay [s]	18.04	16.91	46.37	29.09
I_b,int, Bicycle LOS Score for Intersection	2.628	2.758	2.063	2.855
Bicycle LOS	B	C	B	C

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	67.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.124

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	32	1908	32	515	2103	23	28	202	77	64	274	696
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	1908	32	515	2103	23	28	202	77	64	274	696
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	477	8	129	526	6	7	51	19	16	69	174
Total Analysis Volume [veh/h]	32	1908	32	515	2103	23	28	202	77	64	274	696
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	55	0	18	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	51	51	14	61	61	33	33	33	33	33	51
g / C, Green / Cycle	0.03	0.46	0.46	0.13	0.56	0.56	0.30	0.30	0.30	0.30	0.30	0.46
(v / s)_i Volume / Saturation Flow Rate	0.02	0.52	0.52	0.15	0.55	0.01	0.02	0.11	0.04	0.04	0.14	0.39
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	63	880	833	448	2113	1001	360	570	540	422	570	836
d1, Uniform Delay [s]	52.14	29.52	29.52	47.95	24.27	10.98	27.37	30.15	28.15	27.94	31.49	25.74
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.23	73.70	74.36	73.89	18.52	0.04	0.09	0.37	0.12	0.16	0.63	9.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	1.13	1.13	1.15	1.00	0.02	0.08	0.35	0.14	0.15	0.48	0.83
d, Delay for Lane Group [s/veh]	58.37	103.23	103.88	121.84	42.80	11.02	27.46	30.52	28.27	28.10	32.12	35.27
Lane Group LOS	E	F	F	F	D	B	C	C	C	C	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.98	40.15	38.19	10.69	30.55	0.26	0.54	4.24	1.51	1.25	6.02	17.52
50th-Percentile Queue Length [ft/ln]	24.40	1003.74	954.70	267.30	763.82	6.51	13.38	106.03	37.66	31.18	150.59	438.12
95th-Percentile Queue Length [veh/ln]	1.76	55.44	52.98	17.01	39.62	0.47	0.96	7.62	2.71	2.24	10.05	24.39
95th-Percentile Queue Length [ft/ln]	43.92	1385.90	1324.45	425.18	990.44	11.71	24.09	190.47	67.78	56.12	251.22	609.76

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.37	103.54	103.88	121.84	42.80	11.02	27.46	30.52	28.27	28.10	32.12	35.27
Movement LOS	E	F	F	F	D	B	C	C	C	C	C	D
d_A, Approach Delay [s/veh]	102.81			57.93			29.68			33.99		
Approach LOS	F			E			C			C		
d_I, Intersection Delay [s/veh]	67.18											
Intersection LOS	E											
Intersection V/C	1.124											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.223			3.378			2.296			2.657		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			1073			600			600		
d_b, Bicycle Delay [s]	15.82			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.187			3.738			2.066			3.266		
Bicycle LOS	C			D			B			C		

**Sequence**




Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.773

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	507	478	143	121	344	22	29	402	336	96	549	152
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	507	478	143	121	344	22	29	402	336	96	549	152
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	127	120	36	30	86	6	7	101	84	24	137	38
Total Analysis Volume [veh/h]	507	478	143	121	344	22	29	402	336	96	549	152
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	38	0	0	30	0	0	42	42	0	42	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	36	36	36	36	26	26	66	26	26	26
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.33	0.23	0.23	0.60	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.08	0.07	0.20	0.02	0.21	0.19	0.05	0.20	0.18
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	592	592	592	592	592	141	443	1077	106	443	420
d1, Uniform Delay [s]	33.97	33.97	26.81	26.45	30.97	32.73	40.84	10.86	34.01	40.07	39.37
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.28	0.50	0.11	0.14	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.91	12.91	0.97	0.78	4.80	0.71	16.28	0.76	22.71	5.57	3.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.83	0.24	0.20	0.62	0.21	0.91	0.31	0.90	0.84	0.78
d, Delay for Lane Group [s/veh]	46.88	46.88	27.77	27.23	35.78	33.44	57.13	11.62	56.72	45.64	42.57
Lane Group LOS	D	D	C	C	D	C	E	B	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	14.04	14.04	2.89	2.41	8.87	0.63	12.45	4.09	2.75	10.20	8.58
50th-Percentile Queue Length [ft/ln]	351.08	351.08	72.26	60.23	221.67	15.79	311.23	102.29	68.68	255.06	214.53
95th-Percentile Queue Length [veh/ln]	20.19	20.19	5.20	4.34	13.75	1.14	18.24	7.37	4.94	15.44	13.39
95th-Percentile Queue Length [ft/ln]	504.73	504.73	130.06	108.41	343.76	28.43	455.90	184.13	123.62	386.02	334.64

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	46.88	46.88	27.77	27.23	35.78	35.78	33.44	57.13	11.62	56.72	44.66	42.57
Movement LOS	D	D	C	C	D	D	C	E	B	E	D	D
d_A, Approach Delay [s/veh]	44.46			33.65			36.30			45.71		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	41.15											
Intersection LOS	D											
Intersection V/C	0.773											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.741			2.363			2.669			2.497		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	618			473			691			691		
d_b, Bicycle Delay [s]	26.25			32.07			23.56			23.56		
I_b,int, Bicycle LOS Score for Intersection	3.421			2.363			2.825			2.217		
Bicycle LOS	C			B			C			B		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.452

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	29	245	186	458	538	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	245	186	458	538	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	61	47	115	135	6
Total Analysis Volume [veh/h]	29	245	186	458	538	24
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	30	0	0	80	80	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	85	85	85	85
g / C, Green / Cycle	0.16	0.16	0.77	0.77	0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.10	0.24	0.28	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	278	278	1247	1468	1468	1390
d1, Uniform Delay [s]	39.83	45.36	3.17	3.74	3.96	2.88
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.81	0.25	0.56	0.71	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.88	0.15	0.31	0.37	0.02
d, Delay for Lane Group [s/veh]	39.99	54.17	3.42	4.30	4.67	2.90
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.69	7.17	0.93	2.68	3.34	0.11
50th-Percentile Queue Length [ft/ln]	17.18	179.35	23.30	67.07	83.59	2.69
95th-Percentile Queue Length [veh/ln]	1.24	11.57	1.68	4.83	6.02	0.19
95th-Percentile Queue Length [ft/ln]	30.93	289.17	41.94	120.73	150.47	4.85

**Movement, Approach, & Intersection Results**

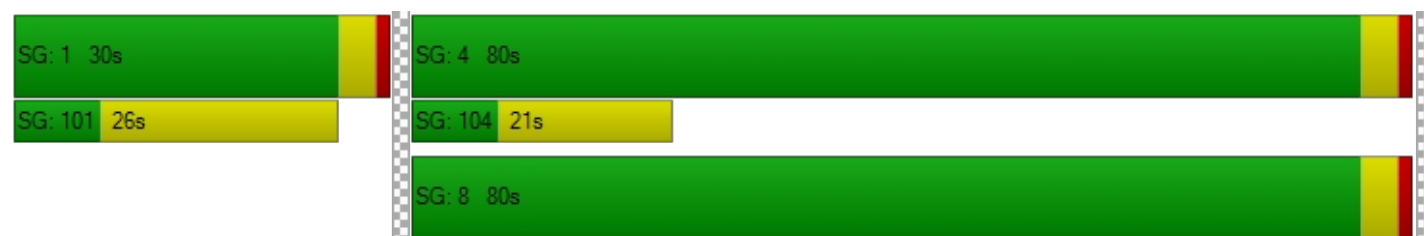
d_M, Delay for Movement [s/veh]	39.99	54.17	3.42	4.30	4.67	2.90
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	52.67		4.05		4.60	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.26					
Intersection LOS	B					
Intersection V/C	0.452					

**Other Modes**


g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.372	2.414	2.291
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.195	5.060
Bicycle LOS	D	F	F

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):74.0  
E  
1.088**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	232	1470	146	208	1329	38	58	879	215	191	1164	301
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	232	1470	146	208	1329	38	58	879	215	191	1164	301
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	368	37	52	332	10	15	220	54	48	291	75
Total Analysis Volume [veh/h]	232	1470	146	208	1329	38	58	879	215	191	1164	301
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	47	0	10	45	0	10	43	0	10	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	53	43	43	53	41	41	49	39	39	49	40	40
g / C, Green / Cycle	0.48	0.39	0.39	0.48	0.37	0.37	0.44	0.35	0.35	0.44	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.13	0.44	0.44	0.12	0.37	0.37	0.03	0.31	0.29	0.11	0.40	0.39
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	317	745	706	257	711	673	252	671	635	375	688	652
d1, Uniform Delay [s]	16.86	33.42	33.42	16.61	34.23	34.11	17.57	33.15	32.21	19.02	35.08	35.08
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.36	0.32	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.94	69.87	68.07	6.01	31.52	31.07	0.46	10.56	6.97	1.07	69.63	56.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	1.12	1.11	0.81	0.99	0.98	0.23	0.87	0.81	0.51	1.11	1.07
d, Delay for Lane Group [s/veh]	30.80	103.30	101.49	22.61	65.75	65.17	18.03	43.71	39.18	20.10	104.71	91.08
Lane Group LOS	C	F	F	C	E	E	B	D	D	C	F	F
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.67	33.73	31.60	3.47	24.41	22.87	0.88	16.07	13.34	3.12	31.21	27.10
50th-Percentile Queue Length [ft/ln]	116.73	843.29	790.05	86.72	610.36	571.87	21.91	401.66	333.54	78.03	780.30	677.50
95th-Percentile Queue Length [veh/ln]	8.21	46.74	43.91	6.24	32.52	30.72	1.58	22.64	19.33	5.62	43.43	37.39
95th-Percentile Queue Length [ft/ln]	205.32	1168.45	1097.72	156.10	812.95	767.96	39.44	566.00	483.30	140.45	1085.65	934.67

**Movement, Approach, & Intersection Results**

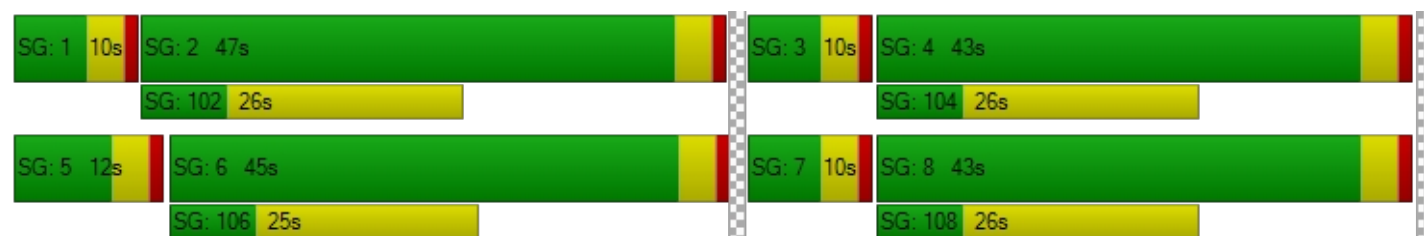
d_M, Delay for Movement [s/veh]	30.80	102.52	101.49	22.61	65.48	65.17	18.03	42.17	39.18	20.10	100.05	91.08
Movement LOS	C	F	F	C	E	E	B	D	D	C	F	F
d_A, Approach Delay [s/veh]	93.43			59.81			40.40			89.19		
Approach LOS	F			E			D			F		
d_I, Intersection Delay [s/veh]	74.00											
Intersection LOS	E											
Intersection V/C	1.088											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.109			3.005			2.943			2.994		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			745			709			709		
d_b, Bicycle Delay [s]	20.40			21.64			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	3.084			2.859			2.510			2.926		
Bicycle LOS	C			C			B			C		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	85.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.145

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	159	1446	226	187	1521	126	271	1011	153	308	1419	211
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	1446	226	187	1521	126	271	1011	153	308	1419	211
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	362	57	47	380	32	68	253	38	77	355	53
Total Analysis Volume [veh/h]	159	1446	226	187	1521	126	271	1011	153	308	1419	211
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	49	0	10	49	0	10	36	0	15	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	45	55	45	45	47	32	32	47	37	37
g / C, Green / Cycle	0.50	0.41	0.41	0.50	0.41	0.41	0.43	0.29	0.29	0.43	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.09	0.45	0.45	0.10	0.45	0.44	0.15	0.32	0.31	0.17	0.37	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	258	779	738	258	779	738	267	550	521	349	1273	603
d1, Uniform Delay [s]	15.01	32.44	32.44	15.27	32.44	32.44	21.27	39.07	39.07	21.86	36.58	27.55
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.12	0.50	0.50	0.11	0.13	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.56	65.85	62.26	3.86	58.94	57.47	31.04	70.60	58.00	7.43	54.85	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.62	1.11	1.10	0.73	1.09	1.08	1.02	1.11	1.07	0.88	1.11	0.35
d, Delay for Lane Group [s/veh]	25.57	98.29	94.71	19.13	91.39	89.91	52.31	109.67	97.08	29.29	91.42	27.90
Lane Group LOS	C	F	F	B	F	F	F	F	F	C	F	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.91	34.28	31.74	2.86	32.79	30.76	6.89	25.36	22.20	6.16	26.37	4.22
50th-Percentile Queue Length [ft/ln]	72.87	857.01	793.53	71.47	819.65	768.94	172.21	634.00	555.03	153.94	659.34	105.52
95th-Percentile Queue Length [veh/ln]	5.25	47.22	43.76	5.15	44.85	42.19	11.30	35.79	31.15	10.23	37.34	7.59
95th-Percentile Queue Length [ft/ln]	131.17	1180.49	1093.95	128.64	1121.23	1054.74	282.46	894.72	778.84	255.68	933.47	189.75

**Movement, Approach, & Intersection Results**

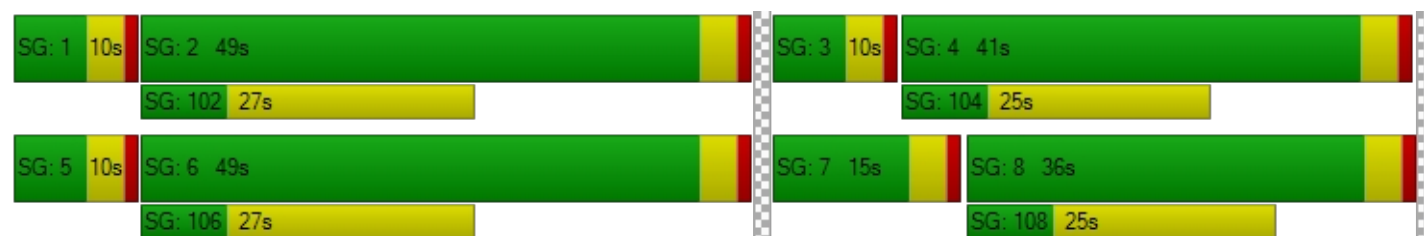
d_M, Delay for Movement [s/veh]	25.57	96.84	94.71	19.13	90.73	89.91	52.31	104.66	97.08	29.29	91.42	27.90
Movement LOS	C	F	F	B	F	F	F	F	F	C	F	C
d_A, Approach Delay [s/veh]	90.39			83.38			93.96			74.63		
Approach LOS	F			F			F			E		
d_I, Intersection Delay [s/veh]	84.95											
Intersection LOS	F											
Intersection V/C	1.145											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.188			3.195			3.018			3.123		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			818			582			673		
d_b, Bicycle Delay [s]	19.20			19.20			27.65			24.22		
I_b,int, Bicycle LOS Score for Intersection	3.070			3.073			2.743			3.158		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):55.6  
E  
1.029**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	175	996	224	87	734	169	219	1172	152	462	1648	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	175	996	224	87	734	169	219	1172	152	462	1648	129
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	249	56	22	184	42	55	293	38	116	412	32
Total Analysis Volume [veh/h]	175	996	224	87	734	169	219	1172	152	462	1648	129
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	10	31	0	17	49	0	19	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	28	28	38	27	27	13	45	45	15	47	47
g / C, Green / Cycle	0.35	0.26	0.26	0.35	0.25	0.25	0.12	0.41	0.41	0.14	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.10	0.26	0.12	0.05	0.25	0.24	0.12	0.36	0.35	0.13	0.43	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	279	985	467	257	468	444	213	775	734	477	1619	767
d1, Uniform Delay [s]	26.02	40.74	34.46	24.68	41.45	40.86	48.50	30.25	29.79	47.26	31.57	19.51
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.38	0.36	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.28	31.32	3.50	0.77	47.56	32.99	36.32	11.52	9.82	12.91	15.20	0.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.63	1.01	0.48	0.34	1.02	0.96	1.03	0.89	0.86	0.97	1.02	0.17
d, Delay for Lane Group [s/veh]	36.29	72.06	37.97	25.45	89.01	73.85	84.82	41.76	39.61	60.17	46.77	19.62
Lane Group LOS	D	F	D	C	F	E	F	D	D	E	F	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.11	17.43	5.51	1.62	18.71	15.24	7.96	18.90	16.91	7.11	24.07	2.06
50th-Percentile Queue Length [ft/ln]	102.75	435.86	137.76	40.46	467.76	381.12	198.88	472.46	422.72	177.79	601.70	51.39
95th-Percentile Queue Length [veh/ln]	7.40	24.44	9.36	2.91	26.16	21.65	12.73	26.03	23.65	11.49	32.54	3.70
95th-Percentile Queue Length [ft/ln]	184.95	611.03	234.00	72.83	654.05	541.21	318.26	650.69	591.32	287.13	813.52	92.50

**Movement, Approach, & Intersection Results**

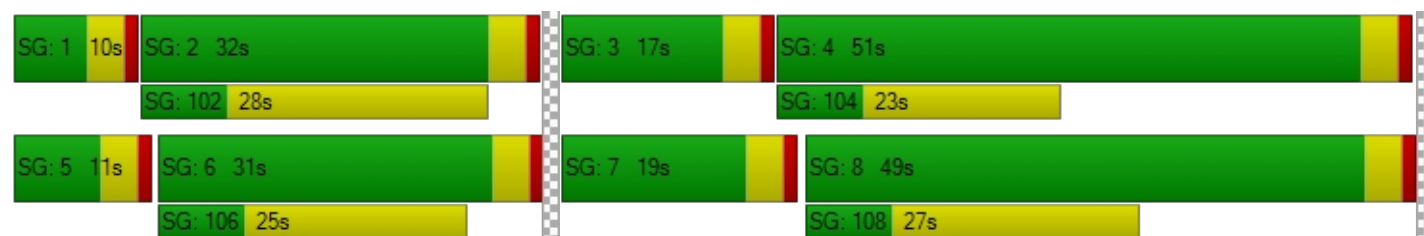
d_M, Delay for Movement [s/veh]	36.29	72.06	37.97	25.45	83.74	73.85	84.82	40.87	39.61	60.17	46.77	19.62
Movement LOS	D	F	D	C	F	E	F	D	D	E	F	B
d_A, Approach Delay [s/veh]	62.10			76.93			46.99			47.97		
Approach LOS	E			E			D			D		
d_I, Intersection Delay [s/veh]	55.57											
Intersection LOS	E											
Intersection V/C	1.029											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.908			2.765			3.064			3.156		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			818			855		
d_b, Bicycle Delay [s]	30.56			31.31			19.20			18.04		
I_b,int, Bicycle LOS Score for Intersection	2.710			2.376			2.833			3.407		
Bicycle LOS	B			B			C			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.853

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	65	61	530	64	92	62	1383	14	76	2130	557
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	65	61	530	64	92	62	1383	14	76	2130	557
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	15	133	16	23	16	346	4	19	533	139
Total Analysis Volume [veh/h]	12	65	61	530	64	92	62	1383	14	76	2130	557
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	22	32	0	10	78	0	0	68	68
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	18	28	74	74	74	65	65	87
g / C, Green / Cycle	0.05	0.05	0.05	0.16	0.25	0.67	0.67	0.67	0.59	0.59	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.03	0.15	0.09	0.03	0.38	0.38	0.04	0.56	0.31
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	101	95	573	456	380	1281	1214	745	2248	1425
d1, Uniform Delay [s]	49.68	51.10	51.08	45.34	33.61	6.05	9.39	9.37	9.58	20.88	3.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	6.77	6.96	6.91	0.44	0.20	1.78	1.86	0.27	10.11	0.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.65	0.64	0.92	0.34	0.16	0.56	0.56	0.10	0.95	0.39
d, Delay for Lane Group [s/veh]	51.01	57.87	58.04	52.26	34.06	6.25	11.17	11.24	9.86	30.99	4.26
Lane Group LOS	D	E	E	D	C	A	B	B	A	C	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.34	1.94	1.83	7.63	3.46	0.48	8.81	8.34	0.82	26.44	3.14
50th-Percentile Queue Length [ft/ln]	8.47	48.56	45.72	190.79	86.52	11.90	220.33	208.61	20.48	661.11	78.47
95th-Percentile Queue Length [veh/ln]	0.61	3.50	3.29	12.16	6.23	0.86	13.68	13.08	1.47	34.88	5.65
95th-Percentile Queue Length [ft/ln]	15.24	87.40	82.30	304.05	155.74	21.41	342.05	327.05	36.87	871.95	141.25

**Movement, Approach, & Intersection Results**

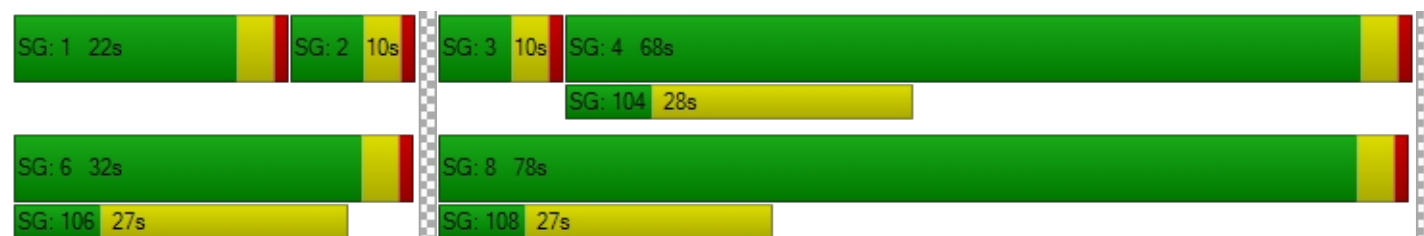
d_M, Delay for Movement [s/veh]	51.01	57.87	58.04	52.26	34.06	34.06	6.25	11.20	11.24	9.86	30.99	4.26
Movement LOS	D	E	E	D	C	C	A	B	B	A	C	A
d_A, Approach Delay [s/veh]	57.35			48.12			10.99			25.02		
Approach LOS	E			D			B			C		
d_I, Intersection Delay [s/veh]	24.99											
Intersection LOS	C											
Intersection V/C	0.853											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.320			2.528			3.047			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			509			1345			1164		
d_b, Bicycle Delay [s]	49.16			30.56			5.89			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.787			2.692			2.763			3.839		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	81.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.042

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	355	283	352	68	172	67	65	1627	175	333	2295	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	355	283	352	68	172	67	65	1627	175	333	2295	110
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	71	88	17	43	17	16	407	44	83	574	28
Total Analysis Volume [veh/h]	355	283	352	68	172	67	65	1627	175	333	2295	110
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	57	0	13	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	33	24	24	33	23	23	69	53	53	69	59	59
g / C, Green / Cycle	0.30	0.22	0.22	0.30	0.21	0.21	0.62	0.48	0.48	0.62	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.20	0.15	0.20	0.04	0.07	0.06	0.04	0.49	0.49	0.19	0.65	0.65
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	536	415	393	389	402	381	244	922	873	358	1028	974
d1, Uniform Delay [s]	33.32	39.49	41.77	27.80	36.62	36.48	8.05	28.33	28.33	9.52	25.25	25.25
k, delay calibration	0.25	0.12	0.24	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.20	2.15	14.54	0.21	0.44	0.43	0.58	31.32	30.78	32.96	100.16	100.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.66	0.68	0.90	0.17	0.31	0.30	0.27	1.01	1.00	0.93	1.20	1.20
d, Delay for Lane Group [s/veh]	36.51	41.64	56.32	28.01	37.06	36.91	8.62	59.65	59.11	42.47	125.41	125.89
Lane Group LOS	D	D	E	C	D	D	A	F	F	D	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.62	7.23	10.77	1.32	2.91	2.60	0.62	31.05	29.28	6.79	53.56	50.87
50th-Percentile Queue Length [ft/ln]	215.48	180.68	269.30	33.11	72.71	65.05	15.47	776.21	732.05	169.68	1339.02	1271.78
95th-Percentile Queue Length [veh/ln]	13.43	11.64	16.15	2.38	5.24	4.68	1.11	40.41	38.20	11.06	75.36	71.88
95th-Percentile Queue Length [ft/ln]	335.85	290.91	403.87	59.59	130.89	117.10	27.85	1010.26	954.93	276.50	1884.12	1796.94

**Movement, Approach, & Intersection Results**

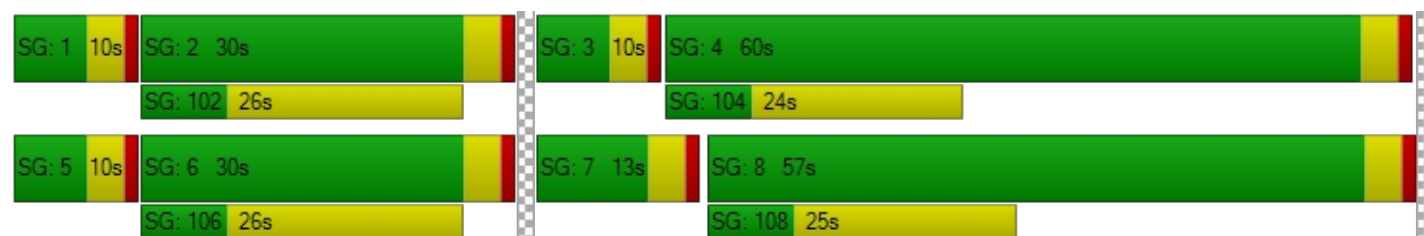
d_M, Delay for Movement [s/veh]	36.51	41.64	56.32	28.01	37.02	36.91	8.62	59.42	59.11	42.47	125.63	125.89
Movement LOS	D	D	E	C	D	D	A	E	E	D	F	F
d_A, Approach Delay [s/veh]	45.02			35.00			57.62			115.53		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	81.19											
Intersection LOS	F											
Intersection V/C	1.042											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.873			2.379			3.475			3.265		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			964			1018		
d_b, Bicycle Delay [s]	32.07			32.07			14.77			13.25		
I_b,int, Bicycle LOS Score for Intersection	3.193			1.813			3.100			3.818		
Bicycle LOS	C			A			C			D		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.901

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	254	259	58	124	76	50	1936	106	123	2352	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	254	259	58	124	76	50	1936	106	123	2352	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	64	65	15	31	19	13	484	27	31	588	14
Total Analysis Volume [veh/h]	116	254	259	58	124	76	50	1936	106	123	2352	56
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	68	0	11	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	19	83	74	74	83	75	75
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.17	0.76	0.67	0.67	0.76	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.14	0.03	0.11	0.03	0.55	0.55	0.07	0.65	0.65
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	151	320	303	107	303	370	1270	1203	709	1290	1222
d1, Uniform Delay [s]	40.64	43.88	44.41	39.28	42.77	3.29	13.50	13.50	3.43	16.24	16.24
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.89	4.45	6.80	4.18	2.44	0.16	6.22	6.55	0.53	16.94	17.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.79	0.85	0.54	0.66	0.14	0.83	0.83	0.17	0.96	0.96
d, Delay for Lane Group [s/veh]	48.53	48.34	51.21	43.46	45.21	3.45	19.72	20.04	3.97	33.18	33.81
Lane Group LOS	D	D	D	D	D	A	B	C	A	C	C
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.12	7.00	7.39	1.47	5.27	0.25	19.13	18.23	0.70	30.55	29.16
50th-Percentile Queue Length [ft/ln]	78.09	174.97	184.64	36.86	131.82	6.19	478.23	455.74	17.43	763.80	728.94
95th-Percentile Queue Length [veh/ln]	5.62	11.34	11.84	2.65	9.04	0.45	26.30	25.23	1.25	39.62	38.01
95th-Percentile Queue Length [ft/ln]	140.56	283.43	296.06	66.34	225.97	11.14	657.55	630.79	31.37	990.42	950.34

**Movement, Approach, & Intersection Results**

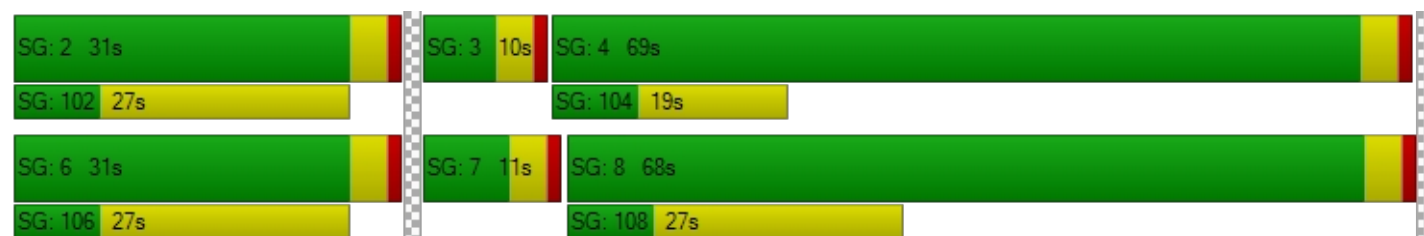
d_M, Delay for Movement [s/veh]	48.53	48.34	51.21	43.46	45.21	45.21	3.45	19.87	20.04	3.97	33.47	33.81
Movement LOS	D	D	D	D	D	D	A	B	C	A	C	C
d_A, Approach Delay [s/veh]	49.55			44.82			19.49			32.05		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	29.88											
Intersection LOS	C											
Intersection V/C	0.901											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.500			2.200			3.378			3.325		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1164			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.62			9.20		
I_b,int, Bicycle LOS Score for Intersection	2.597			1.985			3.286			3.648		
Bicycle LOS	B			A			C			D		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	128.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.217

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	133	613	231	328	491	629	557	1526	78	473	1789	289
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	613	231	328	491	629	557	1526	78	473	1789	289
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	153	58	82	123	157	139	382	20	118	447	72
Total Analysis Volume [veh/h]	133	613	231	328	491	629	557	1526	78	473	1789	289
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	34	0	13	37	37	17	37	0	26	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	30	30	9	33	50	13	33	33	22	42	42
g / C, Green / Cycle	0.05	0.27	0.27	0.08	0.30	0.46	0.12	0.30	0.30	0.20	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.16	0.13	0.09	0.13	0.35	0.16	0.40	0.04	0.26	0.47	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	99	1041	493	288	1144	821	415	1134	537	360	1444	684
d1, Uniform Delay [s]	52.00	34.59	33.28	50.50	30.86	25.04	48.51	38.60	28.30	44.02	34.11	25.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.21	0.11	0.42	0.18	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	169.20	2.45	3.18	72.86	1.18	6.77	158.29	157.96	0.12	157.07	109.59	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.34	0.59	0.47	1.14	0.43	0.77	1.34	1.35	0.15	1.31	1.24	0.42
d, Delay for Lane Group [s/veh]	221.20	37.04	36.46	123.36	32.04	31.81	206.80	196.56	28.43	201.09	143.70	25.60
Lane Group LOS	F	D	D	F	C	C	F	F	C	F	F	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.37	7.42	5.56	6.85	5.40	14.85	14.77	39.87	1.53	25.42	40.67	5.60
50th-Percentile Queue Length [ft/ln]	184.25	185.38	138.89	171.31	135.00	371.24	369.24	996.77	38.24	635.47	1016.79	140.00
95th-Percentile Queue Length [veh/ln]	12.77	11.88	9.42	11.64	9.21	21.17	23.53	59.25	2.75	38.39	58.71	9.48
95th-Percentile Queue Length [ft/ln]	319.33	297.03	235.53	291.08	230.28	529.24	588.13	1481.20	68.83	959.78	1467.80	237.03

**Movement, Approach, & Intersection Results**

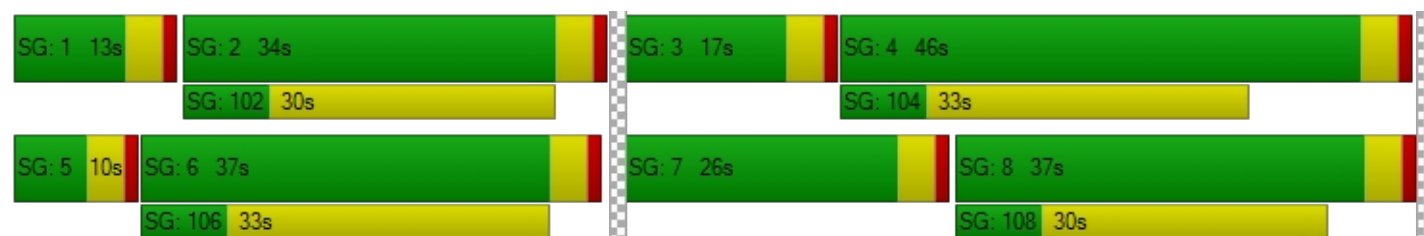
d_M, Delay for Movement [s/veh]	221.20	37.04	36.46	123.36	32.04	31.81	206.80	196.56	28.43	201.09	143.70	25.60
Movement LOS	F	D	D	F	C	C	F	F	C	F	F	C
d_A, Approach Delay [s/veh]	61.97			52.63			193.13			140.96		
Approach LOS	E			D			F			F		
d_I, Intersection Delay [s/veh]	128.02											
Intersection LOS	F											
Intersection V/C	1.217											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.791			3.008			3.260			3.216		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			600			764		
d_b, Bicycle Delay [s]	29.09			26.95			26.95			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.366			2.754			3.342			3.664		
Bicycle LOS	B			C			C			D		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.921

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	33	59	103	0	411	209	58	513	0
Total Analysis Volume [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	33	0	0	59	0	18	77	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		27	27	55	55	16	75
g / C, Green / Cycle		0.25	0.25	0.50	0.50	0.14	0.68
(v / s)_i Volume / Saturation Flow Rate		0.20	0.23	0.43	0.46	0.13	0.54
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		446	446	1898	899	259	2583
d1, Uniform Delay [s]		39.13	40.37	24.26	25.67	46.23	12.25
k, delay calibration		0.27	0.33	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		9.16	20.54	5.57	16.90	10.23	2.61
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.83	0.92	0.87	0.93	0.89	0.79
d, Delay for Lane Group [s/veh]		48.29	60.92	29.83	42.57	56.47	14.87
Lane Group LOS		D	E	C	D	E	B
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		10.43	13.28	19.40	23.50	6.91	16.32
50th-Percentile Queue Length [ft/ln]		260.80	332.08	485.00	587.40	172.63	407.93
95th-Percentile Queue Length [veh/ln]		15.73	19.26	26.62	31.45	11.21	22.94
95th-Percentile Queue Length [ft/ln]		393.23	481.51	665.59	786.14	280.37	573.55

**Movement, Approach, & Intersection Results**

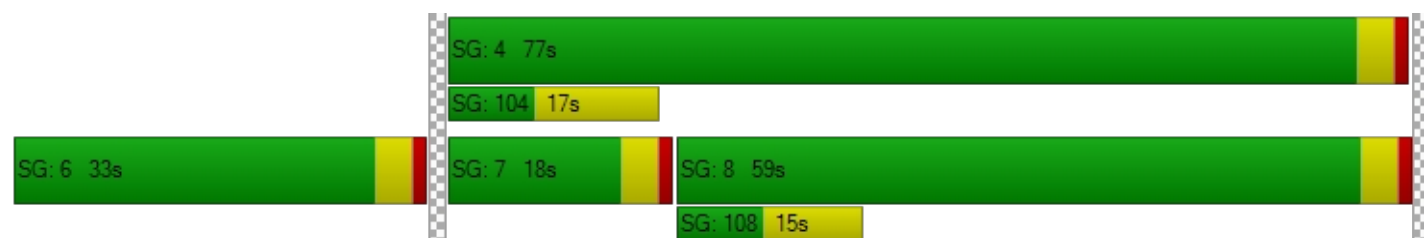
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	48.29	48.29	60.92	0.00	29.83	42.57	56.47	14.87	0.00
Movement LOS				D	D	E		C	D	E	B	
d_A, Approach Delay [s/veh]	0.00			54.96			34.12			19.08		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	30.86											
Intersection LOS	C											
Intersection V/C	0.921											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.701	2.105	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	527	1000	1327
d_b, Bicycle Delay [s]	55.00	29.82	13.75	6.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.847	2.921	3.442
Bicycle LOS	D	C	C	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	86.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.100

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	211	0	136	0	0	0	106	334	0	0	383	57
Total Analysis Volume [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	28	0	0	0	0	0	26	82	0	0	56	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		28	78	46	46
g / C, Green / Cycle	0.22	0.22	0.22		0.26	0.71	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.26		0.24	0.35	0.46	0.49
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	393	393	393		462	2693	790	749
d1, Uniform Delay [s]	42.97	42.97	42.97		39.76	7.19	32.11	32.11
k, delay calibration	0.41	0.41	0.41		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	98.70	98.70	98.70		7.82	0.65	66.93	91.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.17	1.17	1.17		0.92	0.50	1.11	1.17
d, Delay for Lane Group [s/veh]	141.67	141.67	141.67		47.59	7.84	99.05	123.67
Lane Group LOS	F	F	F		D	A	F	F
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	21.34	21.34	21.34		12.00	6.42	34.93	38.22
50th-Percentile Queue Length [ft/ln]	533.62	533.62	533.62		300.03	160.49	873.35	955.40
95th-Percentile Queue Length [veh/ln]	31.50	31.50	31.50		17.68	10.57	48.14	54.00
95th-Percentile Queue Length [ft/ln]	787.45	787.45	787.45		442.07	264.37	1203.60	1349.98

**Movement, Approach, & Intersection Results**

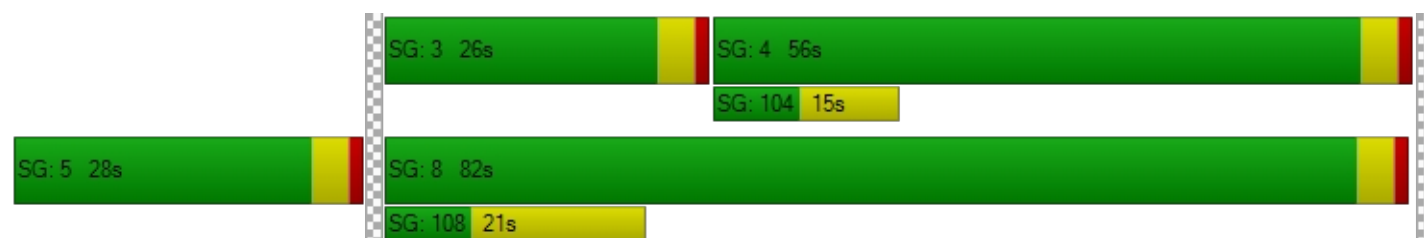
d_M, Delay for Movement [s/veh]	141.67	0.00	141.67	0.00	0.00	0.00	47.59	7.84	0.00	0.00	109.54	123.67
Movement LOS	F		F				D	A			F	F
d_A, Approach Delay [s/veh]	141.67			0.00			17.43			111.36		
Approach LOS	F			A			B			F		
d_I, Intersection Delay [s/veh]	86.23											
Intersection LOS	F											
Intersection V/C	1.100											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.400	2.067	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1418	945
d_b, Bicycle Delay [s]	55.00	55.00	4.65	15.29
I_b,int, Bicycle LOS Score for Intersection	6.419	4.132	3.010	3.008
Bicycle LOS	F	D	C	C

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.579

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	48	1363	85	70	1219	49	21	46	51	105	55	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	1363	85	70	1219	49	21	46	51	105	55	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	341	21	18	305	12	5	12	13	26	14	24
Total Analysis Volume [veh/h]	48	1363	85	70	1219	49	21	46	51	105	55	96
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	49	0	0	49	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18
g / C, Green / Cycle	0.77	0.77	0.77	0.77	0.77	0.77	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.39	0.39	0.04	0.34	0.34	0.07	0.14
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1172	1456	1380	1119	1456	1380	328	335
d1, Uniform Delay [s]	3.07	4.94	4.89	3.11	4.56	4.53	41.35	45.05
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	1.30	1.33	0.11	1.01	1.04	0.67	3.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.51	0.51	0.06	0.45	0.44	0.36	0.76
d, Delay for Lane Group [s/veh]	3.14	6.24	6.22	3.22	5.57	5.57	42.02	48.67
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.23	5.79	5.37	0.34	4.66	4.35	2.93	7.11
50th-Percentile Queue Length [ft/ln]	5.78	144.69	134.31	8.58	116.49	108.85	73.21	177.87
95th-Percentile Queue Length [veh/ln]	0.42	9.73	9.17	0.62	8.20	7.78	5.27	11.49
95th-Percentile Queue Length [ft/ln]	10.40	243.33	229.34	15.45	205.00	194.40	131.77	287.23

**Movement, Approach, & Intersection Results**

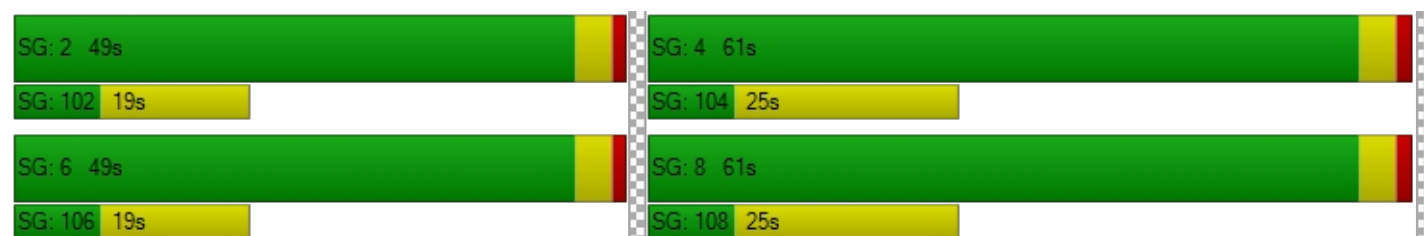
d_M, Delay for Movement [s/veh]	3.14	6.23	6.22	3.22	5.57	5.57	42.02	42.02	42.02	48.67	48.67	48.67
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	6.13			5.45			42.02			48.67		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.56											
Intersection LOS	B											
Intersection V/C	0.579											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.019			2.889			1.924			2.047		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			818			1036			1036		
d_b, Bicycle Delay [s]	19.20			19.20			12.77			12.77		
I_b,int, Bicycle LOS Score for Intersection	2.794			2.663			1.754			1.982		
Bicycle LOS	C			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	61.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.123

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	230	1534	283	115	1760	148	164	807	211	293	1192	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1534	283	115	1760	148	164	807	211	293	1192	139
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	384	71	29	440	37	41	202	53	73	298	35
Total Analysis Volume [veh/h]	230	1534	283	115	1760	148	164	807	211	293	1192	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	10	55	0	10	35	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	61	51	51	61	51	51	41	31	31	41	31	31
g / C, Green / Cycle	0.55	0.47	0.47	0.55	0.46	0.46	0.37	0.28	0.28	0.37	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.13	0.40	0.16	0.06	0.52	0.52	0.09	0.21	0.12	0.16	0.31	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	264	1767	837	440	880	834	267	1065	504	415	1065	505
d1, Uniform Delay [s]	12.53	26.40	18.68	11.67	29.52	29.52	23.79	36.18	32.28	25.83	39.58	30.87
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.78	1.42	0.24	0.31	66.28	66.97	2.29	5.06	2.54	9.70	66.28	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.87	0.87	0.34	0.26	1.11	1.11	0.61	0.76	0.42	0.71	1.12	0.28
d, Delay for Lane Group [s/veh]	21.31	27.82	18.92	11.99	95.79	96.48	26.08	41.24	34.83	35.52	105.86	32.22
Lane Group LOS	C	C	B	B	F	F	C	D	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.47	17.66	4.57	1.36	38.37	36.51	3.11	10.53	4.92	6.82	23.94	3.06
50th-Percentile Queue Length [ft/ln]	86.82	441.50	114.37	33.91	959.22	912.74	77.67	263.19	122.97	170.38	598.43	76.61
95th-Percentile Queue Length [veh/ln]	6.25	24.55	8.08	2.44	52.59	50.29	5.59	15.85	8.56	11.10	34.21	5.52
95th-Percentile Queue Length [ft/ln]	156.27	613.80	202.07	61.04	1314.86	1257.22	139.81	396.22	213.91	277.41	855.25	137.89

**Movement, Approach, & Intersection Results**

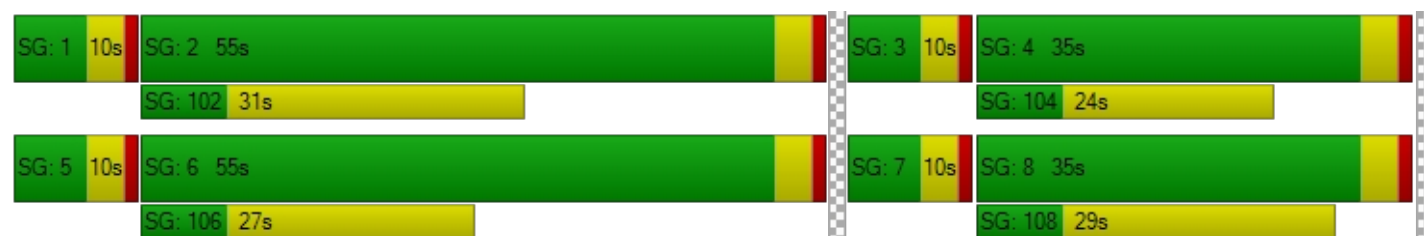
d_M, Delay for Movement [s/veh]	21.31	27.82	18.92	11.99	96.10	96.48	26.08	41.24	34.83	35.52	105.86	32.22
Movement LOS	C	C	B	B	F	F	C	D	C	D	F	C
d_A, Approach Delay [s/veh]	25.86			91.35			37.99			86.86		
Approach LOS	C			F			D			F		
d_I, Intersection Delay [s/veh]	61.62											
Intersection LOS	E											
Intersection V/C	1.123											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.342			3.132			3.067			3.001		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			927			564			564		
d_b, Bicycle Delay [s]	15.82			15.82			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	3.248			3.229			2.535			2.899		
Bicycle LOS	C			C			B			C		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	51.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.009

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	154	1185	271	47	1102	122	197	952	122	523	1374	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	1185	271	47	1102	122	197	952	122	523	1374	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	296	68	12	276	31	49	238	31	131	344	23
Total Analysis Volume [veh/h]	154	1185	271	47	1102	122	197	952	122	523	1374	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	10	41	0	16	37	0	22	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	47	38	38	47	37	37	12	33	33	18	39	39
g / C, Green / Cycle	0.43	0.35	0.35	0.43	0.34	0.34	0.11	0.30	0.30	0.16	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.31	0.15	0.03	0.34	0.33	0.11	0.25	0.07	0.15	0.36	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	264	1326	628	332	638	605	200	1137	539	577	1341	635
d1, Uniform Delay [s]	19.75	33.87	27.44	18.55	36.52	35.94	48.81	36.04	28.97	45.11	35.59	24.24
k, delay calibration	0.11	0.11	0.11	0.11	0.46	0.44	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.05	2.35	0.47	0.19	34.18	27.14	26.36	7.39	0.98	5.79	30.98	0.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.58	0.89	0.43	0.14	1.00	0.97	0.99	0.84	0.23	0.91	1.02	0.14
d, Delay for Lane Group [s/veh]	21.80	36.22	27.91	18.74	70.70	63.08	75.17	43.43	29.95	50.90	66.57	24.71
Lane Group LOS	C	D	C	B	F	E	E	D	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.61	15.07	5.51	0.72	22.79	19.66	6.84	12.93	2.57	7.43	23.25	1.68
50th-Percentile Queue Length [ft/ln]	65.31	376.79	137.66	18.08	569.79	491.41	170.99	323.27	64.25	185.68	581.29	42.01
95th-Percentile Queue Length [veh/ln]	4.70	21.44	9.35	1.30	30.63	26.93	11.13	18.83	4.63	11.90	31.69	3.02
95th-Percentile Queue Length [ft/ln]	117.55	535.96	233.86	32.55	765.63	673.18	278.21	470.70	115.64	297.41	792.30	75.62

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	21.80	36.22	27.91	18.74	67.49	63.08	75.17	43.43	29.95	50.90	66.57	24.71
Movement LOS	C	D	C	B	E	E	E	D	C	D	F	C
d_A, Approach Delay [s/veh]	33.44			65.27			47.06			60.55		
Approach LOS	C			E			D			E		
d_I, Intersection Delay [s/veh]	51.62											
Intersection LOS	D											
Intersection V/C	1.009											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.008			2.844			3.015			3.082		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			673			600			709		
d_b, Bicycle Delay [s]	24.22			24.22			26.95			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.888			2.608			2.608			3.199		
Bicycle LOS	C			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 18: Harbor Boulevard at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	78.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.182

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	94	1834	65	189	540	1508	113	171	181	156	217	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	1834	65	189	540	1508	113	171	181	156	217	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	459	16	47	135	377	28	43	45	39	54	29
Total Analysis Volume [veh/h]	94	1834	65	189	540	1508	113	171	181	156	217	115
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	47	0	0	47	0	0	63	0	0	63	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	71	71	31	31	31
g / C, Green / Cycle	0.65	0.65	0.65	0.65	0.65	0.65	0.28	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.05	0.51	0.51	0.11	0.28	0.84	0.26	0.09	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	68	1233	1168	542	1233	1168	542	81	501
d1, Uniform Delay [s]	7.04	13.91	13.91	7.57	9.46	19.28	38.57	29.96	35.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	242.61	5.23	5.51	1.77	1.13	137.54	4.09	422.55	1.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.39	0.79	0.79	0.35	0.44	1.29	0.86	1.92	0.66
d, Delay for Lane Group [s/veh]	249.65	19.15	19.42	9.34	10.59	156.82	42.66	452.51	36.58
Lane Group LOS	F	B	B	A	B	F	D	F	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.12	17.52	16.69	1.92	6.31	70.74	12.61	11.18	8.00
50th-Percentile Queue Length [ft/ln]	127.98	438.05	417.23	48.11	157.78	1768.38	315.31	279.52	200.00
95th-Percentile Queue Length [veh/ln]	9.21	24.39	23.39	3.46	10.43	102.81	18.44	20.13	12.64
95th-Percentile Queue Length [ft/ln]	230.37	609.68	584.73	86.60	260.78	2570.34	460.92	503.13	315.96

**Movement, Approach, & Intersection Results**

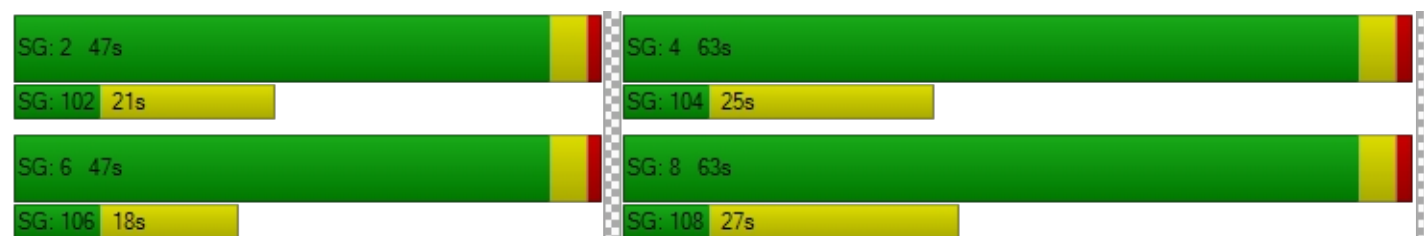
d_M, Delay for Movement [s/veh]	249.65	19.28	19.42	9.34	10.59	156.82	42.66	42.66	42.66	452.51	36.58	36.58
Movement LOS	F	B	B	A	B	F	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	30.15			109.06			42.66			169.54		
Approach LOS	C			F			D			F		
d_I, Intersection Delay [s/veh]	78.45											
Intersection LOS	E											
Intersection V/C	1.182											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.091			3.308			2.972			2.515		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			782			1073			1073		
d_b, Bicycle Delay [s]	20.40			20.40			11.82			11.82		
I_b,int, Bicycle LOS Score for Intersection	3.204			3.405			2.327			2.365		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 15.0  
Level Of Service: B  
Volume to Capacity (v/c): 0.735**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	223	1592	94	58	1593	203	125	43	182	105	55	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	223	1592	94	58	1593	203	125	43	182	105	55	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	398	24	15	398	51	31	11	46	26	14	12
Total Analysis Volume [veh/h]	223	1592	94	58	1593	203	125	43	182	105	55	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	78	78	78	78	78	78	24	24
g / C, Green / Cycle	0.71	0.71	0.71	0.71	0.71	0.71	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.12	0.46	0.46	0.03	0.49	0.48	0.19	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	827	1355	1284	883	1355	1284	430	434
d1, Uniform Delay [s]	5.16	8.31	8.30	4.67	8.81	8.75	42.12	38.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.80	2.32	2.44	0.14	2.81	2.90	3.80	0.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.64	0.64	0.07	0.68	0.68	0.81	0.48
d, Delay for Lane Group [s/veh]	5.96	10.63	10.74	4.81	11.62	11.65	45.92	39.21
Lane Group LOS	A	B	B	A	B	B	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.68	10.25	9.73	0.39	11.68	10.95	9.62	5.09
50th-Percentile Queue Length [ft/ln]	42.07	256.25	243.20	9.70	292.03	273.86	240.53	127.22
95th-Percentile Queue Length [veh/ln]	3.03	15.50	14.84	0.70	17.29	16.38	14.71	8.79
95th-Percentile Queue Length [ft/ln]	75.72	387.52	371.07	17.46	432.16	409.55	367.71	219.71

**Movement, Approach, & Intersection Results**

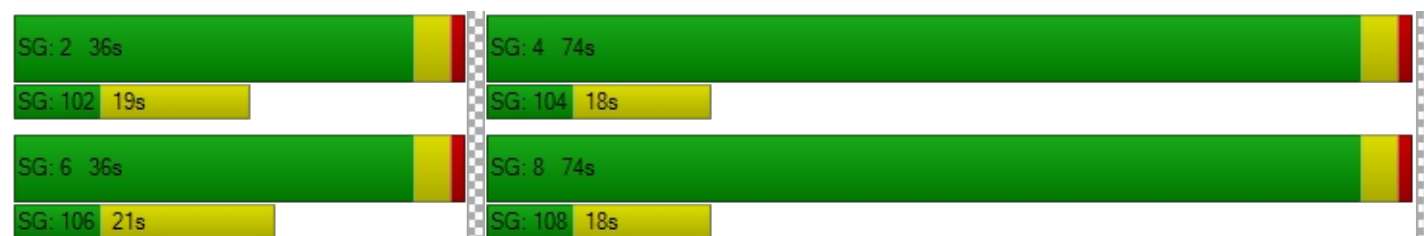
d_M, Delay for Movement [s/veh]	5.96	10.68	10.74	4.81	11.63	11.65	45.92	45.92	45.92	39.21	39.21	39.21
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.13			11.42			45.92			39.21		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	14.99											
Intersection LOS	B											
Intersection V/C	0.735											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.198			3.193			2.447			2.004		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			582			1273			1273		
d_b, Bicycle Delay [s]	27.65			27.65			7.27			7.27		
I_b,int, Bicycle LOS Score for Intersection	3.135			3.089			2.137			1.904		
Bicycle LOS	C			C			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	116.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.123

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	346	1947	277	228	1736	212	243	943	237	286	1409	261
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	346	1947	277	228	1736	212	243	943	237	286	1409	261
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	487	69	57	434	53	61	236	59	72	352	65
Total Analysis Volume [veh/h]	346	1947	277	228	1736	212	243	943	237	286	1409	261
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	44	0	10	42	0	19	39	0	17	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	40	40	6	38	38	15	35	35	13	33	33
g / C, Green / Cycle	0.07	0.36	0.36	0.05	0.35	0.35	0.14	0.32	0.32	0.12	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.10	0.51	0.15	0.07	0.42	0.20	0.14	0.17	0.13	0.16	0.25	0.15
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1380	654	191	1311	621	248	1805	570	216	1703	538
d1, Uniform Delay [s]	51.00	35.02	26.35	52.00	36.02	29.60	47.25	30.77	29.58	48.40	35.93	31.64
k, delay calibration	0.11	0.24	0.11	0.11	0.17	0.15	0.11	0.50	0.50	0.14	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	167.08	186.82	0.44	98.31	95.66	1.26	21.80	1.09	2.23	154.92	4.78	3.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.36	1.41	0.42	1.19	1.21	0.59	0.98	0.52	0.42	1.32	0.83	0.49
d, Delay for Lane Group [s/veh]	218.08	221.84	26.79	150.31	131.68	30.86	69.04	31.86	31.81	203.32	40.72	34.76
Lane Group LOS	F	F	C	F	F	C	E	C	C	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.40	53.78	5.50	5.23	34.57	8.07	8.10	6.95	5.26	15.20	12.31	6.12
50th-Percentile Queue Length [ft/ln]	235.07	1344.46	137.57	130.87	864.14	201.66	202.47	173.81	131.49	379.93	307.85	153.05
95th-Percentile Queue Length [veh/ln]	15.80	80.37	9.35	9.42	49.78	12.72	12.77	11.28	9.02	24.02	18.07	10.18
95th-Percentile Queue Length [ft/ln]	395.05	2009.32	233.75	235.55	1244.46	318.10	319.15	281.92	225.51	600.42	451.72	254.49

**Movement, Approach, & Intersection Results**

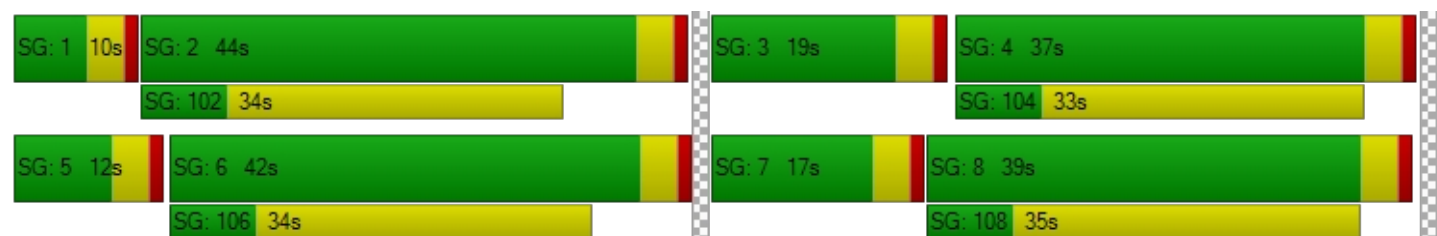
d_M, Delay for Movement [s/veh]	218.08	221.84	26.79	150.31	122.77	30.86	69.04	31.86	31.81	203.32	40.72	34.76
Movement LOS	F	F	C	F	F	C	E	C	C	F	D	C
d_A, Approach Delay [s/veh]	200.31			116.70			38.20			63.70		
Approach LOS	F			F			D			E		
d_I, Intersection Delay [s/veh]	116.64											
Intersection LOS	F											
Intersection V/C	1.123											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.324			3.248			3.148			3.150		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	727			691			636			600		
d_b, Bicycle Delay [s]	22.27			23.56			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.680			2.756			2.342			2.635		
Bicycle LOS	D			C			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	91.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.161

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	320	1519	121	216	1414	230	252	907	240	471	1138	191
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	320	1519	121	216	1414	230	252	907	240	471	1138	191
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	380	30	54	354	58	63	227	60	118	285	48
Total Analysis Volume [veh/h]	320	1519	121	216	1414	230	252	907	240	471	1138	191
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	42	0	13	39	0	17	35	0	20	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	38	38	51	35	35	13	31	31	16	34	34
g / C, Green / Cycle	0.46	0.35	0.35	0.46	0.32	0.32	0.12	0.28	0.28	0.15	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.18	0.40	0.07	0.12	0.37	0.13	0.14	0.24	0.13	0.13	0.36	0.36
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	362	1312	621	312	1208	572	216	1067	505	514	585	554
d1, Uniform Delay [s]	19.27	36.02	25.29	18.00	37.52	29.34	48.41	37.37	32.83	46.27	38.08	38.08
k, delay calibration	0.11	0.15	0.11	0.11	0.15	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.27	74.03	0.15	2.73	79.73	0.46	86.52	8.49	3.18	7.03	95.96	90.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.89	1.16	0.19	0.69	1.17	0.40	1.17	0.85	0.47	0.92	1.18	1.16
d, Delay for Lane Group [s/veh]	26.54	110.05	25.44	20.73	117.25	29.80	134.93	45.86	36.00	53.30	134.04	128.26
Lane Group LOS	C	F	C	C	F	C	F	D	D	D	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.99	30.63	2.25	3.55	29.27	4.81	11.08	12.62	5.73	6.82	31.00	28.48
50th-Percentile Queue Length [ft/ln]	149.70	765.74	56.18	88.83	731.81	120.17	276.92	315.60	143.24	170.39	774.96	711.93
95th-Percentile Queue Length [veh/ln]	10.00	43.66	4.04	6.40	42.06	8.40	17.59	18.45	9.66	11.10	44.33	40.78
95th-Percentile Queue Length [ft/ln]	250.02	1091.44	101.12	159.90	1051.59	210.07	439.83	461.27	241.39	277.43	1108.36	1019.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	26.54	110.05	25.44	20.73	117.25	29.80	134.93	45.86	36.00	53.30	131.75	128.26
Movement LOS	C	F	C	C	F	C	F	D	D	D	F	F
d_A, Approach Delay [s/veh]	91.19			95.23			60.21			110.85		
Approach LOS	F			F			E			F		
d_I, Intersection Delay [s/veh]	91.13											
Intersection LOS	F											
Intersection V/C	1.161											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.126			3.083			3.117			3.139		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			564			618		
d_b, Bicycle Delay [s]	23.56			25.57			28.37			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.177			3.094			2.329			3.045		
Bicycle LOS	C			C			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	643	0	0	459	209	0	0	0	85	117	139
Total Analysis Volume [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	51	51		32	32	32
g / C, Green / Cycle	0.05	0.60	0.51	0.51		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.45	0.47	0.49		0.19	0.12	0.31
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	194	3421	1918	909		576	1216	576
d1, Uniform Delay [s]	45.74	14.57	23.07	24.26		28.48	26.39	33.41
k, delay calibration	0.11	0.50	0.50	0.50		0.15	0.11	0.43
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.57	9.40	25.36		1.32	0.20	26.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.75	0.93	0.98		0.59	0.39	0.96
d, Delay for Lane Group [s/veh]	47.30	16.14	32.48	49.63		29.79	26.59	59.89
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.06	13.34	20.70	25.53		6.87	4.32	17.05
50th-Percentile Queue Length [ft/ln]	26.50	333.48	517.51	638.35		171.79	107.90	426.14
95th-Percentile Queue Length [veh/ln]	1.91	19.33	28.16	33.82		11.17	7.72	23.82
95th-Percentile Queue Length [ft/ln]	47.70	483.23	704.05	845.53		279.26	193.08	595.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.30	16.14	0.00	0.00	32.99	49.63	0.00	0.00	0.00	29.79	26.59	59.89
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	17.13			38.19			0.00			40.94		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	30.39											
Intersection LOS	C											
Intersection V/C	0.939											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.397	2.468
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	1000	0	640
d_b, Bicycle Delay [s]	8.00	12.50	50.00	23.12
I_b,int, Bicycle LOS Score for Intersection	3.020	3.029	4.132	2.682
Bicycle LOS	C	C	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	40.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.016

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	381	0	0	383	105	0	0	0	46	195	212
Total Analysis Volume [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	50	0	0	40	0	0	0	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	46	36	36		46	46	46
g / C, Green / Cycle	0.06	0.46	0.36	0.36		0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.34	0.36		0.27	0.25	0.47
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2629	1369	649		826	872	826
d1, Uniform Delay [s]	46.96	19.80	31.12	31.99		20.13	19.51	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.16	0.12	0.48
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.94	15.06	36.14		1.02	0.60	37.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.58	0.95	1.00		0.59	0.54	1.03
d, Delay for Lane Group [s/veh]	89.94	20.74	46.17	68.13		21.16	20.11	64.60
Lane Group LOS	F	C	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	8.60	17.60	21.61		8.42	7.80	27.12
50th-Percentile Queue Length [ft/ln]	100.53	215.06	439.93	540.17		210.40	194.93	678.08
95th-Percentile Queue Length [veh/ln]	7.24	13.41	24.48	29.30		13.17	12.38	36.37
95th-Percentile Queue Length [ft/ln]	180.95	335.32	611.92	732.45		329.34	309.42	909.36

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	20.74	0.00	0.00	49.47	68.13	0.00	0.00	0.00	21.16	20.52	64.60
Movement LOS	F	C			D	E				C	C	F
d_A, Approach Delay [s/veh]	25.44			53.49			0.00			41.20		
Approach LOS	C			D			A			D		
d_I, Intersection Delay [s/veh]	40.88											
Intersection LOS	D											
Intersection V/C	1.016											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.359			2.534		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	920			720			0			920		
d_b, Bicycle Delay [s]	14.58			20.48			50.00			14.58		
I_b,int, Bicycle LOS Score for Intersection	2.458			2.633			4.132			3.054		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	429	59	114	443	0	253	92	40	0	0	0
Total Analysis Volume [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	21	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	15	58	34	34	34	
g / C, Green / Cycle	0.39	0.39	0.15	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.30	0.13	0.13	0.31	0.29	0.19	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2243	708	527	3329	1176	638	605	
d1, Uniform Delay [s]	26.31	21.16	41.46	12.55	31.01	27.31	24.21	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.54	1.26	4.29	0.61	1.98	0.81	0.23	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.76	0.33	0.86	0.53	0.86	0.57	0.27	
d, Delay for Lane Group [s/veh]	28.85	22.42	45.75	13.17	32.99	28.12	24.44	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	11.93	4.02	5.72	7.62	11.40	7.20	2.79	
50th-Percentile Queue Length [ft/ln]	298.36	100.52	142.94	190.39	284.99	179.97	69.77	
95th-Percentile Queue Length [veh/ln]	17.60	7.24	9.64	12.14	16.94	11.60	5.02	
95th-Percentile Queue Length [ft/ln]	440.01	180.94	240.98	303.53	423.43	289.98	125.58	

**Movement, Approach, & Intersection Results**

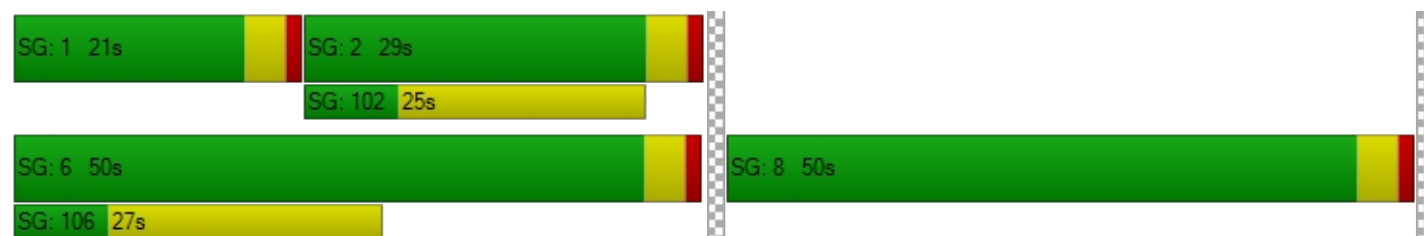
d_M, Delay for Movement [s/veh]	0.00	28.85	22.42	45.75	13.17	0.00	32.99	28.12	24.44	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	28.08			19.82			30.94			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.63											
Intersection LOS	C											
Intersection V/C	0.818											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.511			2.234		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			920			920			0		
d_b, Bicycle Delay [s]	28.13			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.632			2.783			4.099			4.132		
Bicycle LOS	B			C			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	308	58	148	272	0	100	153	16	0	0	0
Total Analysis Volume [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	38	38	19	61	31	31	31	
g / C, Green / Cycle	0.38	0.38	0.19	0.61	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.27	0.17	0.29	0.28	0.27	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1428	676	665	2302	566	597	566	
d1, Uniform Delay [s]	26.19	26.70	39.46	10.89	32.67	32.00	24.37	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.65	6.49	4.25	0.70	7.13	4.04	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.68	0.72	0.89	0.47	0.89	0.84	0.11	
d, Delay for Lane Group [s/veh]	28.84	33.19	43.71	11.59	39.80	36.04	24.46	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	9.98	10.86	7.35	6.38	12.45	11.74	1.07	
50th-Percentile Queue Length [ft/ln]	249.52	271.48	183.85	159.51	311.28	293.62	26.72	
95th-Percentile Queue Length [veh/ln]	15.16	16.26	11.80	10.52	18.24	17.37	1.92	
95th-Percentile Queue Length [ft/ln]	379.05	406.59	295.03	263.07	455.96	434.13	48.10	

**Movement, Approach, & Intersection Results**

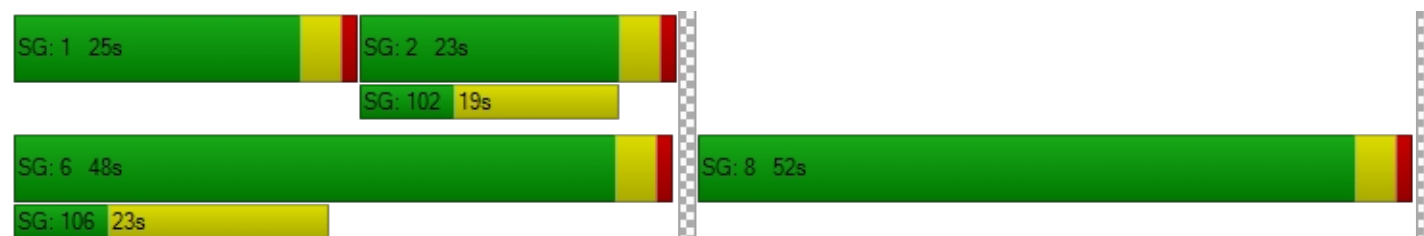
d_M, Delay for Movement [s/veh]	0.00	29.75	33.19	43.71	11.59	0.00	39.80	36.69	24.46	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	30.29			22.88			37.13			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.07											
Intersection LOS	C											
Intersection V/C	0.817											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.293			2.417		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.363			2.945			2.443			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.172

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	89	574	98	29	765
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	89	574	98	29	765
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	22	144	25	7	191
Total Analysis Volume [veh/h]	0	89	574	98	29	765
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.17	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	0.00	13.38	0.00	0.00	9.05	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.61	0.00	0.00	0.10	0.00
95th-Percentile Queue Length [ft/ln]	0.00	15.37	0.00	0.00	2.44	0.00
d_A, Approach Delay [s/veh]	13.38		0.00		0.33	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.93					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.649

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	1108	234	84	709	0	48	0	57	340	0	77
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1108	234	84	709	0	48	0	57	340	0	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	277	59	21	177	0	12	0	14	85	0	19
Total Analysis Volume [veh/h]	0	1108	234	84	709	0	48	0	57	340	0	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	10	61	0	0	49	0	49	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	69	69	79	79	23	23	23	23
g / C, Green / Cycle	0.63	0.63	0.72	0.72	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.35	0.37	0.05	0.19	0.03	0.03	0.19	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1199	1136	984	2731	408	408	362	375
d1, Uniform Delay [s]	11.57	11.93	4.56	5.35	35.38	35.57	42.46	35.98
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.89	2.26	0.04	0.23	0.13	0.15	11.67	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.59	0.09	0.26	0.12	0.14	0.94	0.21
d, Delay for Lane Group [s/veh]	13.46	14.19	4.60	5.58	35.51	35.72	54.13	36.24
Lane Group LOS	B	B	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.32	9.67	0.51	2.58	1.06	1.27	10.10	1.74
50th-Percentile Queue Length [ft/ln]	232.95	241.83	12.84	64.43	26.61	31.77	252.46	43.52
95th-Percentile Queue Length [veh/ln]	14.32	14.77	0.92	4.64	1.92	2.29	15.31	3.13
95th-Percentile Queue Length [ft/ln]	358.10	369.34	23.11	115.98	47.90	57.19	382.75	78.33



**Movement, Approach, & Intersection Results**

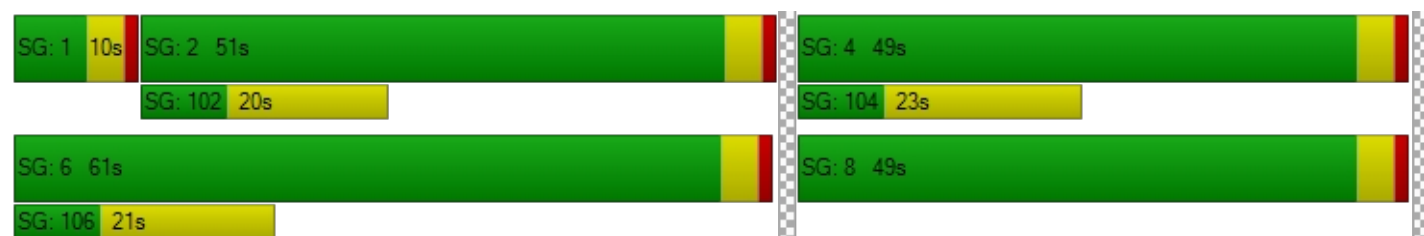
d_M, Delay for Movement [s/veh]	0.00	13.75	14.19	4.60	5.58	0.00	35.51	35.72	35.72	54.13	0.00	36.24
Movement LOS		B	B	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	13.82			5.48			35.62			50.83		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	18.00											
Intersection LOS	B											
Intersection V/C	0.649											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.773			1.776			2.266		
Crosswalk LOS	F			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			1036			818			0		
d_b, Bicycle Delay [s]	18.04			12.77			19.20			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.667			2.214			1.733			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	19.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.196

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	137	514	397	8	69	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	514	397	8	69	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	129	99	2	17	22
Total Analysis Volume [veh/h]	137	514	397	8	69	88
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.12	0.01	0.00	0.00	0.20	0.14
d_M, Delay for Movement [s/veh]	8.54	0.00	0.00	0.00	18.96	14.28
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.40	0.00	0.00	0.00	1.44	1.44
95th-Percentile Queue Length [ft/ln]	10.07	0.00	0.00	0.00	35.92	35.92
d_A, Approach Delay [s/veh]	1.80		0.00		16.34	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.08					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	15.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	644	495	0	7	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	644	495	0	7	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	161	124	0	2	34
Total Analysis Volume [veh/h]	0	644	495	0	7	137
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.24
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	15.64	13.43
Movement LOS		A	A		C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	25.18	25.18
d_A, Approach Delay [s/veh]	0.00		0.00		13.54	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.52					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.094

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	634	29	44	652	33	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	634	29	44	652	33	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	7	11	163	8	16
Total Analysis Volume [veh/h]	634	29	44	652	33	64
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.05	0.01	0.09	0.14
d_M, Delay for Movement [s/veh]	0.00	0.00	9.08	0.00	17.79	15.19
Movement LOS	A	A	A	A	C	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.15	0.00	0.88	0.88
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.74	0.00	21.95	21.95
d_A, Approach Delay [s/veh]	0.00		0.57		16.08	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.35					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	35	975	136	0	802	12	0	0	29	0	0	271
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	975	136	0	802	12	0	0	29	0	0	271
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	244	34	0	201	3	0	0	7	0	0	68
Total Analysis Volume [veh/h]	35	975	136	0	802	12	0	0	29	0	0	271
Pedestrian Volume [ped/h]	0			0			0			0		



**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.00	0.57
d_M, Delay for Movement [s/veh]	9.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.38	0.00	0.00	22.18
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	3.51
95th-Percentile Queue Length [ft/ln]	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	0.00	0.00	87.63
d_A, Approach Delay [s/veh]	0.29			0.00			11.38			22.18		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	2.96											
Intersection LOS	C											





*APPENDIX G-II*

**YEAR 2030 BUILDOUT SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	42.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	129	838	142	267	965	217	219	745	166	171	956	254
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	838	142	267	965	217	219	745	166	171	956	254
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	210	36	67	241	54	55	186	42	43	239	64
Total Analysis Volume [veh/h]	129	838	142	267	965	217	219	745	166	171	956	254
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	11	43	0	15	45	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	53	53	7	54	54	11	27	27	7	23	23
g / C, Green / Cycle	0.05	0.48	0.48	0.06	0.49	0.49	0.10	0.25	0.25	0.07	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.15	0.08	0.08	0.21	0.21	0.12	0.16	0.16	0.05	0.17	0.14
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	190	2721	859	225	1852	877	181	935	443	234	1211	382
d1, Uniform Delay [s]	51.12	17.63	16.33	51.51	18.32	18.36	49.51	37.34	37.44	50.40	41.03	39.76
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.20	0.29	0.41	93.00	0.74	1.57	105.42	0.80	1.74	4.35	1.19	1.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.68	0.31	0.17	1.18	0.43	0.44	1.21	0.66	0.67	0.73	0.79	0.66
d, Delay for Lane Group [s/veh]	55.31	17.93	16.74	144.50	19.06	19.93	154.94	38.14	39.17	54.75	42.22	41.75
Lane Group LOS	E	B	B	F	B	B	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.85	4.35	2.11	6.01	6.66	6.57	10.26	7.51	7.34	2.45	8.25	6.48
50th-Percentile Queue Length [ft/ln]	46.36	108.86	52.85	150.25	166.40	164.24	256.44	187.72	183.56	61.18	206.25	162.00
95th-Percentile Queue Length [veh/ln]	3.34	7.78	3.80	10.54	10.89	10.77	16.62	12.00	11.79	4.41	12.96	10.65
95th-Percentile Queue Length [ft/ln]	83.45	194.41	95.12	263.42	272.18	269.32	415.53	300.07	294.66	110.13	324.01	266.37

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	55.31	17.93	16.74	144.50	19.21	19.93	154.94	38.32	39.17	54.75	42.22	41.75
Movement LOS	E	B	B	F	B	B	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	22.12			42.40			61.04			43.69		
Approach LOS	C			D			E			D		
d_I, Intersection Delay [s/veh]	42.47											
Intersection LOS	D											
Intersection V/C	0.630											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.120			3.071			2.942			3.133		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			745			691		
d_b, Bicycle Delay [s]	23.56			22.91			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.170			2.357			2.181			2.319		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	8	1171	631	86	1428	24	58	122	11	578	85	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1171	631	86	1428	24	58	122	11	578	85	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	293	158	22	357	6	15	31	3	145	21	0
Total Analysis Volume [veh/h]	8	1171	631	86	1428	24	58	122	11	578	85	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	31	0	10	31	0	0	32	0	0	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	56	6	60	60	9	9	9	23	23
g / C, Green / Cycle	0.01	0.50	0.05	0.55	0.55	0.08	0.08	0.08	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.00	0.21	0.05	0.31	0.16	0.03	0.06	0.01	0.18	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	23	2870	100	2075	983	153	162	153	379	379
d1, Uniform Delay [s]	53.88	17.08	51.59	16.37	13.49	47.61	49.24	46.36	41.99	42.09
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.17	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.55	0.43	18.86	1.11	0.75	1.54	6.95	0.20	9.17	10.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.41	0.86	0.56	0.29	0.38	0.75	0.07	0.87	0.88
d, Delay for Lane Group [s/veh]	62.43	17.51	70.45	17.48	14.24	49.15	56.19	46.56	51.16	52.12
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.27	6.14	2.87	9.54	3.93	1.57	3.58	0.29	9.55	9.75
50th-Percentile Queue Length [ft/ln]	6.86	153.48	71.77	238.51	98.26	39.24	89.60	7.15	238.63	243.72
95th-Percentile Queue Length [veh/ln]	0.49	10.20	5.17	14.61	7.07	2.82	6.45	0.51	14.61	14.87
95th-Percentile Queue Length [ft/ln]	12.36	255.07	129.18	365.15	176.87	70.62	161.28	12.87	365.30	371.73

**Movement, Approach, & Intersection Results**

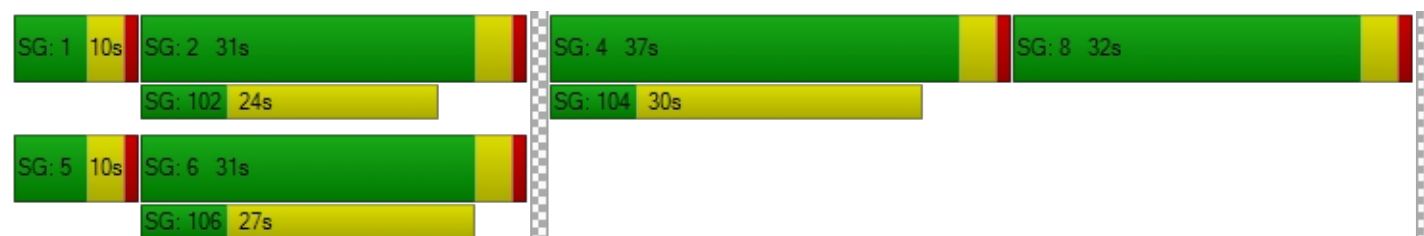
d_M, Delay for Movement [s/veh]	62.43	17.51	0.00	70.45	16.89	14.24	49.15	56.19	46.56	51.57	52.12	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	17.81			19.84			53.50			51.64		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.88											
Intersection LOS	C											
Intersection V/C	0.656											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.989			2.216			2.233		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			509			600		
d_b, Bicycle Delay [s]	31.31			31.31			30.56			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.208			2.406			1.875			2.654		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	46	1495	45	209	1795	16	21	96	70	87	118	336
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	1495	45	209	1795	16	21	96	70	87	118	336
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	374	11	52	449	4	5	24	18	22	30	84
Total Analysis Volume [veh/h]	46	1495	45	209	1795	16	21	96	70	87	118	336
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	59	0	14	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	67	67	10	73	73	20	20	20	20	20	35
g / C, Green / Cycle	0.04	0.61	0.61	0.09	0.66	0.66	0.19	0.19	0.19	0.19	0.19	0.31
(v / s)_i Volume / Saturation Flow Rate	0.03	0.42	0.41	0.06	0.47	0.01	0.01	0.05	0.04	0.05	0.06	0.19
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	77	1165	1104	323	2518	1193	269	352	333	288	352	565
d1, Uniform Delay [s]	51.67	14.11	14.05	48.16	11.85	6.31	36.93	38.44	37.98	38.35	38.92	31.81
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.22
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.12	3.22	3.33	2.17	1.75	0.02	0.12	0.41	0.31	0.58	0.56	2.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.68	0.68	0.65	0.71	0.01	0.08	0.27	0.21	0.30	0.34	0.59
d, Delay for Lane Group [s/veh]	58.79	17.33	17.38	50.33	13.60	6.33	37.05	38.85	38.29	38.93	39.47	33.84
Lane Group LOS	E	B	B	D	B	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.40	13.19	12.41	2.86	13.21	0.13	0.48	2.26	1.63	2.06	2.82	7.79
50th-Percentile Queue Length [ft/ln]	34.95	329.87	310.22	71.52	330.33	3.16	11.91	56.59	40.75	51.42	70.52	194.64
95th-Percentile Queue Length [veh/ln]	2.52	19.15	18.19	5.15	19.17	0.23	0.86	4.07	2.93	3.70	5.08	12.36
95th-Percentile Queue Length [ft/ln]	62.91	478.80	454.65	128.73	479.36	5.69	21.44	101.87	73.36	92.56	126.94	309.04

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.79	17.35	17.38	50.33	13.60	6.33	37.05	38.85	38.29	38.93	39.47	33.84
Movement LOS	E	B	B	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	18.56			17.34			38.44			35.88		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.01											
Intersection LOS	C											
Intersection V/C	0.745											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.123			3.173			2.230			2.483		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1073			600			600		
d_b, Bicycle Delay [s]	13.75			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.868			3.226			1.868			2.452		
Bicycle LOS	C			C			A			B		

**Sequence**


Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	244	296	70	92	214	24	21	239	158	85	313	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	244	296	70	92	214	24	21	239	158	85	313	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	74	18	23	54	6	5	60	40	21	78	36
Total Analysis Volume [veh/h]	244	296	70	92	214	24	21	239	158	85	313	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	34	0	0	30	0	0	46	46	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	40	40	40	40	40	17	17	61	17	17	17
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.15	0.15	0.56	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.14	0.16	0.04	0.05	0.13	0.01	0.13	0.09	0.05	0.13	0.12
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	662	662	662	662	662	113	294	1006	118	294	279
d1, Uniform Delay [s]	25.36	26.23	22.81	23.10	25.26	39.67	44.85	11.69	41.15	45.00	44.43
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	2.18	0.32	0.44	1.52	0.78	5.40	0.33	8.02	6.06	4.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.45	0.11	0.14	0.36	0.19	0.81	0.16	0.72	0.83	0.76
d, Delay for Lane Group [s/veh]	26.93	28.41	23.13	23.54	26.78	40.45	50.25	12.02	49.17	51.06	48.66
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.92	6.21	1.25	1.67	4.78	0.51	6.71	1.93	2.31	6.93	5.82
50th-Percentile Queue Length [ft/ln]	122.95	155.22	31.33	41.76	119.39	12.79	167.76	48.13	57.71	173.29	145.53
95th-Percentile Queue Length [veh/ln]	8.55	10.30	2.26	3.01	8.36	0.92	10.96	3.47	4.15	11.25	9.78
95th-Percentile Queue Length [ft/ln]	213.87	257.38	56.39	75.16	208.99	23.03	273.96	86.64	103.87	281.23	244.45

**Movement, Approach, & Intersection Results**

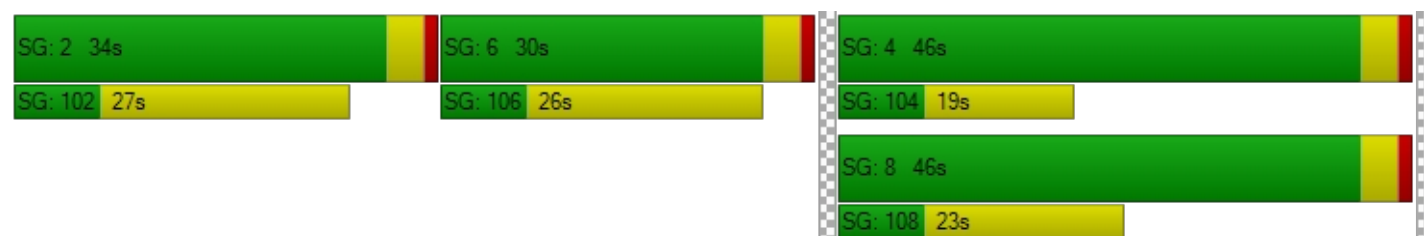
d_M, Delay for Movement [s/veh]	26.93	28.41	23.13	23.54	26.78	26.78	40.45	50.25	12.02	49.17	50.54	48.66
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	27.21			25.87			35.31			49.83		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.21											
Intersection LOS	D											
Intersection V/C	0.478											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.522			2.236			2.504			2.370		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			473			764			764		
d_b, Bicycle Delay [s]	29.09			32.07			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.566			2.104			2.249			2.006		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.330

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	148	82	285	426	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	148	82	285	426	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	37	21	71	107	7
Total Analysis Volume [veh/h]	16	148	82	285	426	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	73	0	0	37	37	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.05	0.15	0.22	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	183	183	1413	1569	1569	1486
d1, Uniform Delay [s]	44.72	48.29	1.75	1.97	2.15	1.70
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	8.22	0.08	0.25	0.43	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.81	0.06	0.18	0.27	0.02
d, Delay for Lane Group [s/veh]	44.92	56.51	1.83	2.22	2.58	1.72
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.41	4.38	0.24	0.93	1.53	0.08
50th-Percentile Queue Length [ft/ln]	10.16	109.38	6.02	23.27	38.22	2.05
95th-Percentile Queue Length [veh/ln]	0.73	7.81	0.43	1.68	2.75	0.15
95th-Percentile Queue Length [ft/ln]	18.29	195.14	10.84	41.88	68.79	3.69

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	44.92	56.51	1.83	2.22	2.58	1.72
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.38		2.13		2.53	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	11.17					
Intersection LOS	B					
Intersection V/C	0.330					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.156	2.256	2.195
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.738	4.883
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 73s

SG: 101 26s

SG: 4 37s

SG: 104 21s

SG: 8 37s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	86	1206	47	59	1132	54	71	203	98	46	240	57
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	1206	47	59	1132	54	71	203	98	46	240	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	302	12	15	283	14	18	51	25	12	60	14
Total Analysis Volume [veh/h]	86	1206	47	59	1132	54	71	203	98	46	240	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	35	51	0	19	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	81	72	72	81	71	71	21	12	12	21	12	12
g / C, Green / Cycle	0.74	0.65	0.65	0.74	0.65	0.65	0.19	0.11	0.11	0.19	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.05	0.34	0.34	0.03	0.32	0.32	0.04	0.08	0.08	0.03	0.08	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1096	1241	1176	1075	1232	1167	304	214	203	300	201	190
d1, Uniform Delay [s]	4.03	10.04	9.98	3.96	10.06	9.99	37.49	47.32	47.02	36.95	47.96	47.79
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	1.57	1.62	0.02	1.44	1.48	0.39	5.13	4.23	0.23	6.27	5.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.52	0.52	0.05	0.50	0.49	0.23	0.75	0.69	0.15	0.77	0.74
d, Delay for Lane Group [s/veh]	4.17	11.60	11.59	3.98	11.50	11.46	37.88	52.46	51.24	37.19	54.22	53.44
Lane Group LOS	A	B	B	A	B	B	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.51	8.08	7.54	0.32	7.59	7.05	1.65	4.54	3.95	1.05	4.49	4.06
50th-Percentile Queue Length [ft/ln]	12.72	201.91	188.54	8.03	189.77	176.34	41.22	113.59	98.65	26.29	112.33	101.39
95th-Percentile Queue Length [veh/ln]	0.92	12.74	12.05	0.58	12.11	11.41	2.97	8.04	7.10	1.89	7.97	7.30
95th-Percentile Queue Length [ft/ln]	22.89	318.43	301.14	14.45	302.73	285.23	74.20	200.98	177.57	47.32	199.24	182.51

**Movement, Approach, & Intersection Results**

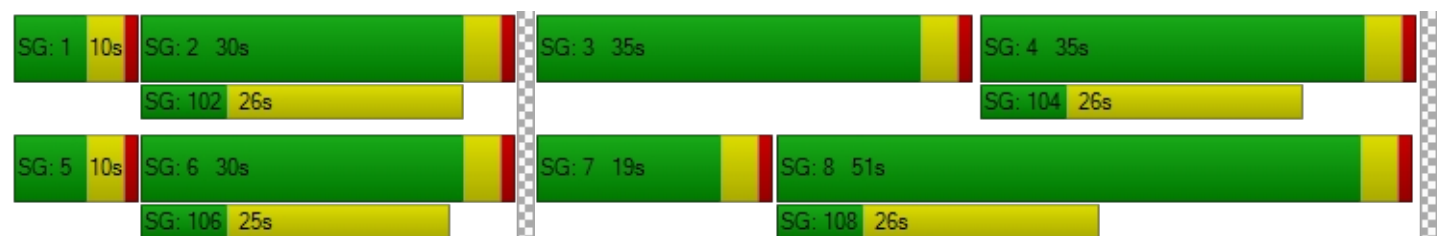
d_M, Delay for Movement [s/veh]	4.17	11.60	11.59	3.98	11.48	11.46	37.88	52.20	51.24	37.19	53.95	53.44
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.12			11.13			49.21			51.62		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.63											
Intersection LOS	B											
Intersection V/C	0.547											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.828			2.825			2.538			2.493		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			855			564		
d_b, Bicycle Delay [s]	32.07			32.07			18.04			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.664			2.587			1.867			1.843		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.880

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	154	1226	201	173	1250	176	183	631	159	253	739	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	1226	201	173	1250	176	183	631	159	253	739	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	307	50	43	313	44	46	158	40	63	185	41
Total Analysis Volume [veh/h]	154	1226	201	173	1250	176	183	631	159	253	739	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	49	0	10	48	0	14	41	0	10	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	53	53	63	53	53	39	29	29	39	25	25
g / C, Green / Cycle	0.57	0.48	0.48	0.57	0.48	0.48	0.36	0.26	0.26	0.36	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.09	0.39	0.38	0.10	0.39	0.38	0.10	0.22	0.21	0.14	0.19	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	509	912	864	512	905	857	400	501	475	358	866	410
d1, Uniform Delay [s]	11.04	24.46	23.98	11.17	24.76	24.35	25.45	38.30	37.54	26.60	40.75	36.14
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.21	0.17	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.52	7.96	7.29	0.39	8.19	7.65	0.82	7.03	4.42	2.55	2.53	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.30	0.82	0.79	0.34	0.82	0.80	0.46	0.84	0.78	0.71	0.85	0.40
d, Delay for Lane Group [s/veh]	12.56	32.42	31.28	11.56	32.95	32.01	26.26	45.32	41.97	29.15	43.28	36.78
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.93	17.90	16.05	2.01	17.99	16.28	3.52	11.56	9.72	5.21	9.81	3.84
50th-Percentile Queue Length [ft/ln]	48.32	447.39	401.26	50.17	449.78	407.12	87.96	288.97	242.92	130.19	245.24	95.93
95th-Percentile Queue Length [veh/ln]	3.48	24.83	22.62	3.61	24.95	22.90	6.33	17.13	14.83	8.95	14.95	6.91
95th-Percentile Queue Length [ft/ln]	86.98	620.84	565.52	90.31	623.69	572.58	158.32	428.36	370.72	223.75	373.66	172.67

**Movement, Approach, & Intersection Results**

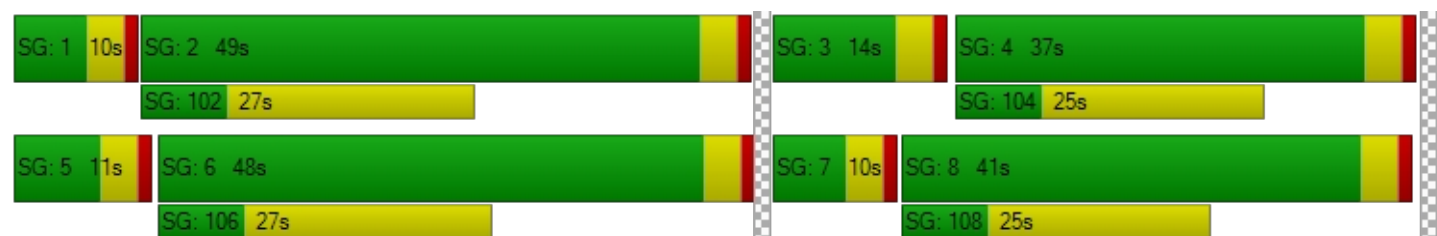
d_M, Delay for Movement [s/veh]	12.56	31.97	31.28	11.56	32.57	32.01	26.26	44.20	41.97	29.15	43.28	36.78
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	29.99			30.23			40.46			39.26		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.00											
Intersection LOS	C											
Intersection V/C	0.880											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.067			2.992			2.816			2.937		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			800			673			600		
d_b, Bicycle Delay [s]	19.20			19.80			24.22			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.864			2.879			2.362			2.514		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.613

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	136	363	163	27	456	81	121	810	140	246	932	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	136	363	163	27	456	81	121	810	140	246	932	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	91	41	7	114	20	30	203	35	62	233	11
Total Analysis Volume [veh/h]	136	363	163	27	456	81	121	810	140	246	932	43
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	13	55	0	13	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	57	49	49	57	47	47	9	32	32	9	32	32
g / C, Green / Cycle	0.52	0.45	0.45	0.52	0.42	0.42	0.08	0.29	0.29	0.08	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.08	0.10	0.09	0.02	0.15	0.14	0.07	0.26	0.25	0.07	0.25	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	836	1699	805	912	805	762	148	557	528	289	1115	528
d1, Uniform Delay [s]	13.99	18.60	18.50	13.13	21.48	21.32	49.68	37.32	36.65	49.85	36.43	28.17
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.15	0.12	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	0.29	0.57	0.01	1.20	1.18	10.27	7.19	4.55	7.02	1.74	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.16	0.21	0.20	0.03	0.35	0.33	0.81	0.90	0.85	0.85	0.84	0.08
d, Delay for Lane Group [s/veh]	14.41	18.89	19.06	13.15	22.68	22.50	59.95	44.51	41.19	56.87	38.17	28.23
Lane Group LOS	B	B	B	B	C	C	E	D	D	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.85	2.87	2.63	0.33	5.14	4.62	3.69	13.83	11.89	3.61	11.83	0.83
50th-Percentile Queue Length [ft/ln]	46.26	71.85	65.83	8.25	128.39	115.62	92.23	345.84	297.24	90.30	295.79	20.86
95th-Percentile Queue Length [veh/ln]	3.33	5.17	4.74	0.59	8.85	8.15	6.64	19.93	17.54	6.50	17.47	1.50
95th-Percentile Queue Length [ft/ln]	83.28	129.33	118.49	14.85	221.30	203.79	166.01	498.34	438.61	162.54	436.82	37.55

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	14.41	18.89	19.06	13.15	22.61	22.50	59.95	43.24	41.19	56.87	38.17	28.23
Movement LOS	B	B	B	B	C	C	E	D	D	E	D	C
d_A, Approach Delay [s/veh]	18.01			22.14			44.86			41.59		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	35.03											
Intersection LOS	D											
Intersection V/C	0.613											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.707			2.522			2.828			2.931		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			927			927		
d_b, Bicycle Delay [s]	30.56			30.56			15.82			15.82		
I_b,int, Bicycle LOS Score for Intersection	2.106			2.025			2.443			2.567		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.430

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	13	23	26	159	20	28	25	998	7	23	1213	161
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	23	26	159	20	28	25	998	7	23	1213	161
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	7	40	5	7	6	250	2	6	303	40
Total Analysis Volume [veh/h]	13	23	26	159	20	28	25	998	7	23	1213	161
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	8	17	85	85	85	78	78	90
g / C, Green / Cycle	0.05	0.05	0.05	0.07	0.15	0.77	0.77	0.77	0.71	0.71	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.05	0.03	0.01	0.27	0.27	0.01	0.32	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	78	89	84	246	276	1228	1470	1393	1142	2689	1466
d1, Uniform Delay [s]	50.36	50.61	50.73	49.82	40.51	2.86	3.87	3.86	4.76	6.90	2.08
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.98	1.52	2.05	2.83	0.30	0.01	0.66	0.70	0.03	0.55	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.26	0.31	0.65	0.17	0.02	0.35	0.35	0.02	0.45	0.11
d, Delay for Lane Group [s/veh]	51.34	52.12	52.77	52.64	40.80	2.86	4.53	4.56	4.79	7.45	2.11
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.37	0.65	0.74	2.22	1.16	0.10	3.12	2.96	0.15	5.57	0.50
50th-Percentile Queue Length [ft/ln]	9.13	16.22	18.51	55.58	28.92	2.60	78.05	74.04	3.77	139.37	12.58
95th-Percentile Queue Length [veh/ln]	0.66	1.17	1.33	4.00	2.08	0.19	5.62	5.33	0.27	9.45	0.91
95th-Percentile Queue Length [ft/ln]	16.43	29.19	33.32	100.04	52.06	4.68	140.49	133.27	6.78	236.18	22.65

**Movement, Approach, & Intersection Results**

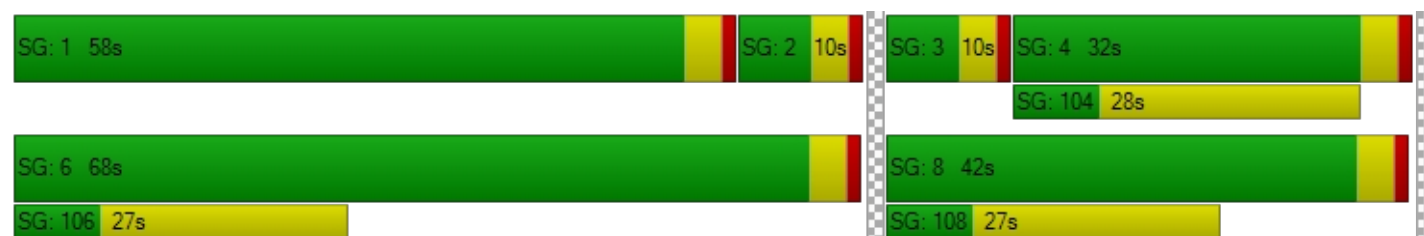
d_M, Delay for Movement [s/veh]	51.34	52.12	52.77	52.64	40.80	40.80	2.86	4.54	4.56	4.79	7.45	2.11
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.23			49.90			4.50			6.79		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.27											
Intersection LOS	B											
Intersection V/C	0.430											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.201			2.268			2.773			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.662			1.901			2.409			2.712		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	114	114	180	124	183	77	57	1036	84	201	1265	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	114	180	124	183	77	57	1036	84	201	1265	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	29	45	31	46	19	14	259	21	50	316	14
Total Analysis Volume [veh/h]	114	114	180	124	183	77	57	1036	84	201	1265	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	14	37	0	10	49	0	13	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	26	14	14	26	15	15	76	66	66	76	67	67
g / C, Green / Cycle	0.23	0.12	0.12	0.23	0.13	0.13	0.69	0.60	0.60	0.69	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.10	0.07	0.07	0.07	0.03	0.31	0.30	0.11	0.36	0.35
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	402	237	224	424	255	242	932	1129	1069	1002	1159	1098
d1, Uniform Delay [s]	34.39	44.88	46.87	34.60	44.49	44.26	5.38	13.08	12.94	5.87	13.03	12.96
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.38	1.51	6.55	0.38	1.78	1.63	0.03	1.69	1.69	0.45	2.18	2.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.48	0.80	0.29	0.54	0.50	0.06	0.52	0.50	0.20	0.59	0.58
d, Delay for Lane Group [s/veh]	34.78	46.39	53.42	34.98	46.26	45.89	5.41	14.77	14.63	6.32	15.21	15.21
Lane Group LOS	C	D	D	C	D	D	A	B	B	A	B	B
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.54	3.00	5.19	2.78	3.63	3.20	0.39	8.50	7.78	1.60	10.25	9.59
50th-Percentile Queue Length [ft/ln]	63.49	74.90	129.63	69.42	90.85	79.94	9.75	212.49	194.41	39.94	256.33	239.79
95th-Percentile Queue Length [veh/ln]	4.57	5.39	8.92	5.00	6.54	5.76	0.70	13.28	12.35	2.88	15.50	14.67
95th-Percentile Queue Length [ft/ln]	114.29	134.83	222.99	124.96	163.52	143.90	17.55	332.03	308.75	71.88	387.61	366.77

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	34.78	46.39	53.42	34.98	46.17	45.89	5.41	14.71	14.63	6.32	15.21	15.21
Movement LOS	C	D	D	C	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	46.25			42.50			14.25			14.03		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	21.01											
Intersection LOS	C											
Intersection V/C	0.619											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.656			2.340			2.848			2.892		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			818			873		
d_b, Bicycle Delay [s]	29.09			26.95			19.20			17.47		
I_b,int, Bicycle LOS Score for Intersection	2.233			1.876			2.531			2.814		
Bicycle LOS	B			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.498

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	58	42	86	30	23	35	27	1231	50	54	1399	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	42	86	30	23	35	27	1231	50	54	1399	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	11	22	8	6	9	7	308	13	14	350	12
Total Analysis Volume [veh/h]	58	42	86	30	23	35	27	1231	50	54	1399	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	8	8	8	8	8	94	86	86	94	87	87
g / C, Green / Cycle	0.07	0.07	0.07	0.07	0.07	0.86	0.78	0.78	0.86	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.05	0.02	0.03	0.02	0.35	0.34	0.03	0.39	0.39
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	106	131	124	123	124	1374	1477	1399	1405	1502	1423
d1, Uniform Delay [s]	49.27	48.76	50.08	48.49	49.27	1.12	4.19	4.16	1.13	3.97	3.95
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.39	1.41	6.83	1.01	2.74	0.01	0.99	1.02	0.05	1.18	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.32	0.70	0.24	0.47	0.02	0.45	0.44	0.04	0.50	0.49
d, Delay for Lane Group [s/veh]	53.66	50.17	56.90	49.51	52.02	1.12	5.17	5.18	1.19	5.15	5.17
Lane Group LOS	D	D	E	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.66	1.15	2.54	0.81	1.63	0.04	4.37	4.08	0.10	4.79	4.50
50th-Percentile Queue Length [ft/ln]	41.54	28.73	63.61	20.37	40.67	1.03	109.16	101.95	2.49	119.67	112.38
95th-Percentile Queue Length [veh/ln]	2.99	2.07	4.58	1.47	2.93	0.07	7.79	7.34	0.18	8.38	7.97
95th-Percentile Queue Length [ft/ln]	74.76	51.72	114.50	36.67	73.21	1.86	194.83	183.50	4.48	209.38	199.30

**Movement, Approach, & Intersection Results**

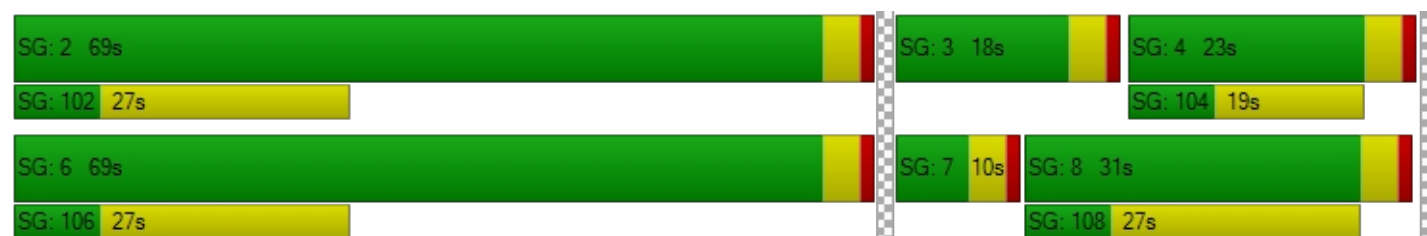
d_M, Delay for Movement [s/veh]	53.66	50.17	56.90	49.51	52.02	52.02	1.12	5.18	5.18	1.19	5.16	5.17
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.37			51.16			5.09			5.02		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.34											
Intersection LOS	A											
Intersection V/C	0.498											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.278			2.048			2.938			2.908		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.867			1.705			2.639			2.799		
Bicycle LOS	A			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	50.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.863

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	144	407	209	153	374	301	310	1099	87	400	1074	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	407	209	153	374	301	310	1099	87	400	1074	134
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	102	52	38	94	75	78	275	22	100	269	34
Total Analysis Volume [veh/h]	144	407	209	153	374	301	310	1099	87	400	1074	134
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	16	34	0	27	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	34	34	7	33	49	12	30	30	23	41	41
g / C, Green / Cycle	0.07	0.31	0.31	0.06	0.30	0.45	0.11	0.27	0.27	0.21	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.11	0.12	0.04	0.10	0.17	0.09	0.29	0.05	0.22	0.28	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	132	1185	561	217	1144	804	383	1032	489	376	1411	668
d1, Uniform Delay [s]	51.00	29.18	29.48	50.61	29.83	20.23	47.89	40.09	30.69	43.52	30.32	23.50
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.17	0.11	0.11	0.11	0.32	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	64.99	0.79	1.89	4.12	0.76	0.45	4.13	34.61	0.17	54.60	0.87	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.09	0.34	0.37	0.70	0.33	0.37	0.81	1.07	0.18	1.06	0.76	0.20
d, Delay for Lane Group [s/veh]	115.99	29.97	31.37	54.74	30.59	20.68	52.02	74.69	30.86	98.12	31.20	23.65
Lane Group LOS	F	C	C	D	C	C	D	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.99	4.27	4.59	2.19	3.96	5.18	4.36	18.67	1.79	15.84	12.38	2.39
50th-Percentile Queue Length [ft/ln]	149.67	106.72	114.70	54.68	98.93	129.40	108.97	466.72	44.84	396.01	309.53	59.72
95th-Percentile Queue Length [veh/ln]	10.29	7.66	8.10	3.94	7.12	8.91	7.78	26.76	3.23	23.12	18.15	4.30
95th-Percentile Queue Length [ft/ln]	257.34	191.43	202.52	98.43	178.07	222.67	194.57	669.00	80.71	578.00	453.80	107.49

**Movement, Approach, & Intersection Results**

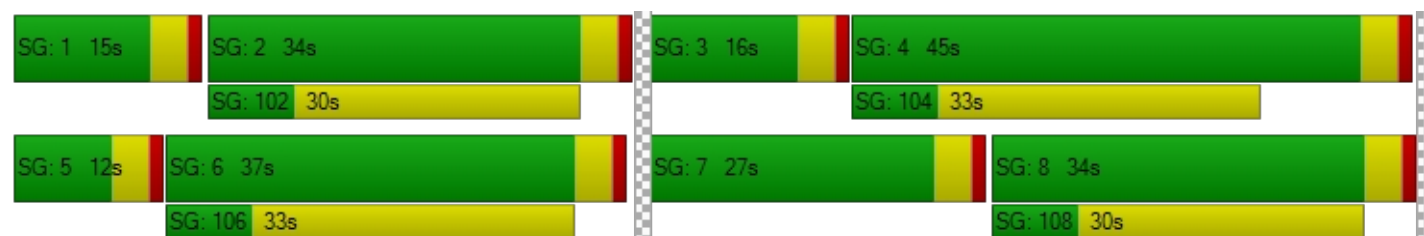
d_M, Delay for Movement [s/veh]	115.99	29.97	31.37	54.74	30.59	20.68	52.02	74.69	30.86	98.12	31.20	23.65
Movement LOS	F	C	C	D	C	C	D	F	C	F	C	C
d_A, Approach Delay [s/veh]	46.65			31.45			67.45			47.21		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	50.79											
Intersection LOS	D											
Intersection V/C	0.863											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.726			2.837			3.023			2.961		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			545			745		
d_b, Bicycle Delay [s]	29.09			26.95			29.09			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.187			2.243			2.794			2.886		
Bicycle LOS	B			B			C			C		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	24.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.847

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	9	65	0	275	166	108	335	0
Total Analysis Volume [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	33	0	54	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		18	18	51	51	29	84
g / C, Green / Cycle		0.16	0.16	0.47	0.47	0.26	0.77
(v / s)_i Volume / Saturation Flow Rate		0.08	0.14	0.29	0.37	0.24	0.35
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		291	291	1778	842	471	2910
d1, Uniform Delay [s]		41.80	45.19	21.92	24.69	39.48	4.66
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.16	9.48	1.63	7.44	7.79	0.53
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.46	0.89	0.62	0.79	0.92	0.46
d, Delay for Lane Group [s/veh]		42.95	54.67	23.55	32.12	47.28	5.19
Lane Group LOS		D	D	C	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.41	7.67	10.77	15.84	12.24	4.64
50th-Percentile Queue Length [ft/ln]		85.28	191.85	269.21	396.10	305.91	115.94
95th-Percentile Queue Length [veh/ln]		6.14	12.22	16.15	22.37	17.97	8.17
95th-Percentile Queue Length [ft/ln]		153.51	305.43	403.76	559.30	449.33	204.23

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	42.95	42.95	54.67	0.00	23.55	32.12	47.28	5.19	0.00
Movement LOS				D	D	D		C	C	D	A	
d_A, Approach Delay [s/veh]	0.00			50.66			26.78			15.46		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	24.07											
Intersection LOS	C											
Intersection V/C	0.847											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.537			1.917			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			345			527			1509		
d_b, Bicycle Delay [s]	55.00			37.64			29.82			3.31		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.211			2.531			3.023		
Bicycle LOS	D			B			B			C		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.852

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	147	0	109	0	0	0	98	218	0	0	278	39
Total Analysis Volume [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	44	0	0	0	0	0	33	66	0	0	33	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25		26	77	47	47
g / C, Green / Cycle	0.22	0.22	0.22		0.24	0.70	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.22	0.23	0.33	0.35
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	404	404	404		429	2671	814	771
d1, Uniform Delay [s]	40.83	40.83	40.83		40.76	6.30	26.95	27.72
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.95	4.95	4.95		7.83	0.33	7.22	9.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.91	0.33	0.78	0.82
d, Delay for Lane Group [s/veh]	45.78	45.78	45.78		48.59	6.62	34.17	37.29
Lane Group LOS	D	D	D		D	A	C	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.33	9.33	9.33		11.12	3.63	15.48	16.29
50th-Percentile Queue Length [ft/ln]	233.28	233.28	233.28		277.88	90.64	386.96	407.28
95th-Percentile Queue Length [veh/ln]	14.34	14.34	14.34		16.58	6.53	21.93	22.91
95th-Percentile Queue Length [ft/ln]	358.53	358.53	358.53		414.57	163.15	548.26	572.76

**Movement, Approach, & Intersection Results**

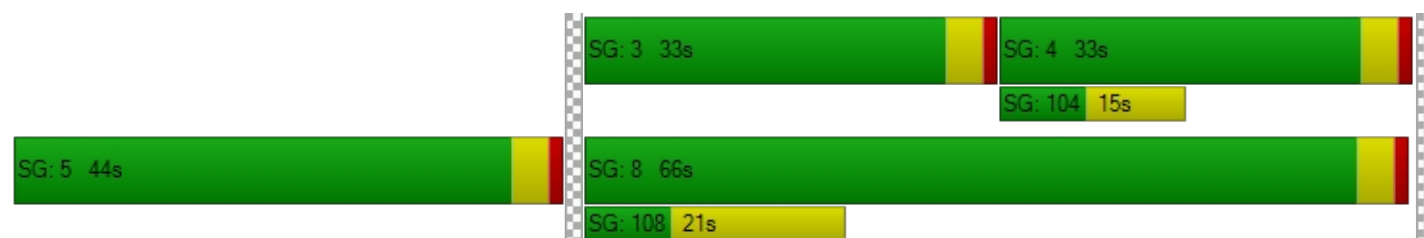
d_M, Delay for Movement [s/veh]	45.78	0.00	45.78	0.00	0.00	0.00	48.59	6.62	0.00	0.00	35.51	37.29
Movement LOS	D		D				D	A			D	D
d_A, Approach Delay [s/veh]	45.78			0.00			19.61			35.73		
Approach LOS	D			A			B			D		
d_I, Intersection Delay [s/veh]	32.90											
Intersection LOS	C											
Intersection V/C	0.852											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.283	1.966	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1127	527
d_b, Bicycle Delay [s]	55.00	55.00	10.47	29.82
I_b,int, Bicycle LOS Score for Intersection	5.824	4.132	2.602	2.604
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	6.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	33	733	29	20	865	20	15	20	34	34	18	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	733	29	20	865	20	15	20	34	34	18	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	183	7	5	216	5	4	5	9	9	5	9
Total Analysis Volume [veh/h]	33	733	29	20	865	20	15	20	34	34	18	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.21	0.20	0.01	0.24	0.24	0.04	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1494	1644	1557	1507	1644	1557	152	158
d1, Uniform Delay [s]	1.02	1.26	1.26	1.01	1.32	1.31	50.23	50.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.34	0.36	0.02	0.42	0.44	2.12	2.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.24	0.24	0.01	0.28	0.28	0.45	0.55
d, Delay for Lane Group [s/veh]	1.05	1.61	1.61	1.03	1.74	1.75	52.35	53.66
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.05	0.77	0.72	0.03	0.93	0.88	1.94	2.45
50th-Percentile Queue Length [ft/ln]	1.32	19.23	18.12	0.79	23.28	22.07	48.43	61.35
95th-Percentile Queue Length [veh/ln]	0.09	1.38	1.30	0.06	1.68	1.59	3.49	4.42
95th-Percentile Queue Length [ft/ln]	2.37	34.61	32.61	1.42	41.91	39.72	87.18	110.43

**Movement, Approach, & Intersection Results**

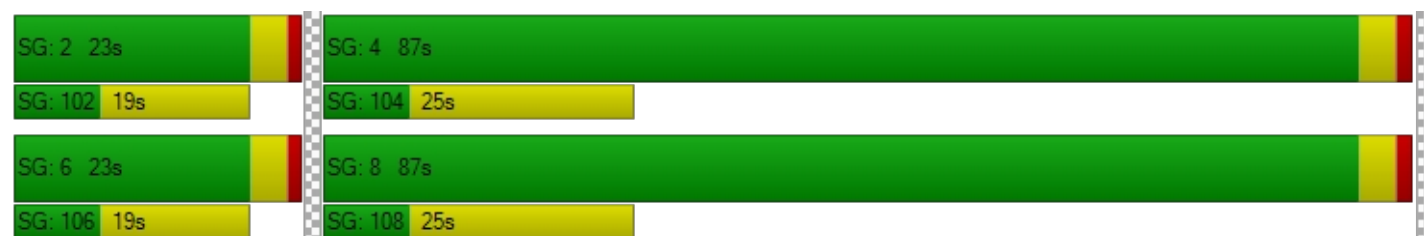
d_M, Delay for Movement [s/veh]	1.05	1.61	1.61	1.03	1.74	1.75	52.35	52.35	52.35	53.66	53.66	53.66
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.59			1.73			52.35			53.66		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	A											
Intersection V/C	0.311											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.695			2.660			1.840			1.828		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.215			2.306			1.673			1.702		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.908

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	164	1419	170	160	1422	222	212	553	156	180	749	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	164	1419	170	160	1422	222	212	553	156	180	749	255
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	355	43	40	356	56	53	138	39	45	187	64
Total Analysis Volume [veh/h]	164	1419	170	160	1422	222	212	553	156	180	749	255
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	12	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	61	51	51	61	51	51	41	29	29	41	29	29
g / C, Green / Cycle	0.56	0.46	0.46	0.56	0.47	0.47	0.37	0.26	0.26	0.37	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.09	0.37	0.09	0.09	0.45	0.44	0.12	0.15	0.09	0.10	0.20	0.14
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	328	1753	830	522	889	842	432	999	473	533	998	473
d1, Uniform Delay [s]	11.78	25.48	17.63	11.75	28.16	27.87	24.87	34.97	32.72	24.38	37.24	34.84
k, delay calibration	0.11	0.11	0.11	0.11	0.42	0.41	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.18	0.93	0.12	0.33	18.76	17.26	0.87	2.21	1.86	1.71	5.18	4.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.81	0.20	0.31	0.96	0.94	0.49	0.55	0.33	0.34	0.75	0.54
d, Delay for Lane Group [s/veh]	12.96	26.42	17.75	12.08	46.93	45.13	25.74	37.18	34.58	26.09	42.42	39.20
Lane Group LOS	B	C	B	B	D	D	C	D	C	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.02	15.60	2.58	1.91	25.19	23.05	4.05	6.66	3.60	3.54	9.87	6.41
50th-Percentile Queue Length [ft/ln]	50.49	390.00	64.41	47.71	629.69	576.28	101.21	166.45	89.92	88.41	246.87	160.13
95th-Percentile Queue Length [veh/ln]	3.64	22.08	4.64	3.43	33.42	30.93	7.29	10.89	6.47	6.37	15.03	10.56
95th-Percentile Queue Length [ft/ln]	90.88	551.94	115.94	85.87	835.46	773.13	182.18	272.24	161.86	159.14	375.70	263.89

**Movement, Approach, & Intersection Results**

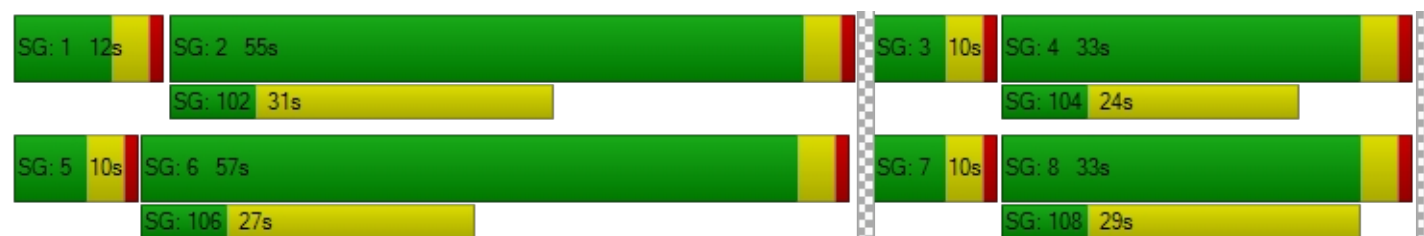
d_M, Delay for Movement [s/veh]	12.96	26.42	17.75	12.08	46.20	45.13	25.74	37.18	34.58	26.09	42.42	39.20
Movement LOS	B	C	B	B	D	D	C	D	C	C	D	D
d_A, Approach Delay [s/veh]	24.32			43.04			34.11			39.24		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	35.00											
Intersection LOS	C											
Intersection V/C	0.908											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.105			3.114			2.910			2.907		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			964			527			527		
d_b, Bicycle Delay [s]	15.82			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	3.006			3.048			2.319			2.536		
Bicycle LOS	C			C			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	137	634	239	46	842	88	117	726	143	364	898	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	634	239	46	842	88	117	726	143	364	898	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	159	60	12	211	22	29	182	36	91	225	11
Total Analysis Volume [veh/h]	137	634	239	46	842	88	117	726	143	364	898	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	57	0	13	55	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	34	34	43	31	31	9	41	41	14	46	46
g / C, Green / Cycle	0.39	0.31	0.31	0.39	0.29	0.29	0.08	0.37	0.37	0.13	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.08	0.17	0.13	0.03	0.26	0.25	0.07	0.19	0.08	0.10	0.24	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	362	1189	563	554	544	515	148	1412	669	449	1586	751
d1, Uniform Delay [s]	22.08	31.20	29.97	20.93	37.67	37.24	49.58	26.89	23.63	46.69	24.47	19.14
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	0.37	0.51	0.06	5.36	4.42	8.99	1.34	0.73	3.57	1.47	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.53	0.42	0.08	0.89	0.86	0.79	0.51	0.21	0.81	0.57	0.06
d, Delay for Lane Group [s/veh]	22.73	31.57	30.48	20.99	43.03	41.67	58.57	28.23	24.36	50.27	25.94	19.28
Lane Group LOS	C	C	C	C	D	D	E	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.40	6.96	5.07	0.75	13.16	11.81	3.52	7.58	2.67	5.05	9.08	0.67
50th-Percentile Queue Length [ft/ln]	59.99	173.95	126.87	18.82	329.11	295.33	88.02	189.52	66.72	126.28	227.11	16.76
95th-Percentile Queue Length [veh/ln]	4.32	11.28	8.77	1.36	19.11	17.45	6.34	12.10	4.80	8.74	14.03	1.21
95th-Percentile Queue Length [ft/ln]	107.98	282.10	219.23	33.88	477.87	436.24	158.43	302.40	120.10	218.43	350.69	30.17

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	22.73	31.57	30.48	20.99	42.45	41.67	58.57	28.23	24.36	50.27	25.94	19.28
Movement LOS	C	C	C	C	D	D	E	C	C	D	C	B
d_A, Approach Delay [s/veh]	30.11			41.37			31.27			32.52		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	33.68											
Intersection LOS	C											
Intersection V/C	0.714											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.846			2.654			2.864			2.948		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			927			473			473		
d_b, Bicycle Delay [s]	14.77			15.82			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.393			2.365			2.373			2.635		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	82	1514	44	165	1840	80	103	121	159	139	173	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1514	44	165	1840	80	103	121	159	139	173	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	379	11	41	460	20	26	30	40	35	43	27
Total Analysis Volume [veh/h]	82	1514	44	165	1840	80	103	121	159	139	173	109
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	52	0	0	52	0	0	58	0	0	58	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	26	26	26
g / C, Green / Cycle	0.69	0.69	0.69	0.69	0.69	0.69	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.42	0.42	0.09	0.52	0.52	0.21	0.08	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	692	1320	1251	879	1320	1251	460	79	418
d1, Uniform Delay [s]	5.36	8.86	8.82	5.63	10.64	10.64	41.10	33.84	38.37
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	2.09	2.17	0.47	3.89	4.10	4.00	354.43	1.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.61	0.60	0.19	0.75	0.75	0.83	1.76	0.67
d, Delay for Lane Group [s/veh]	5.71	10.94	10.99	6.11	14.53	14.74	45.10	388.26	40.26
Lane Group LOS	A	B	B	A	B	B	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.62	9.72	9.16	1.29	14.64	13.95	10.50	9.46	7.09
50th-Percentile Queue Length [ft/ln]	15.53	242.98	228.95	32.17	366.11	348.66	262.56	236.38	177.20
95th-Percentile Queue Length [veh/ln]	1.12	14.83	14.12	2.32	20.92	20.07	15.82	17.02	11.45
95th-Percentile Queue Length [ft/ln]	27.95	370.80	353.02	57.91	523.01	501.77	395.43	425.48	286.35

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.71	10.97	10.99	6.11	14.63	14.74	45.10	45.10	45.10	388.26	40.26	40.26
Movement LOS	A	B	B	A	B	B	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	10.71			13.96			45.10			155.16		
Approach LOS	B			B			D			F		
d_I, Intersection Delay [s/veh]	28.54											
Intersection LOS	C											
Intersection V/C	0.789											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.244			3.199			2.191			2.429		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			873			982			982		
d_b, Bicycle Delay [s]	17.47			17.47			14.25			14.25		
I_b,int, Bicycle LOS Score for Intersection	2.913			3.280			2.192			2.254		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	168	1019	75	51	1192	146	90	42	147	127	38	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	168	1019	75	51	1192	146	90	42	147	127	38	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	255	19	13	298	37	23	11	37	32	10	11
Total Analysis Volume [veh/h]	168	1019	75	51	1192	146	90	42	147	127	38	44
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	40	0	0	40	0	0	70	0	0	70	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	83	83	83	83	83	83	19	19
g / C, Green / Cycle	0.75	0.75	0.75	0.75	0.75	0.75	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.09	0.30	0.29	0.03	0.37	0.36	0.16	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1122	1430	1355	1189	1430	1355	357	367
d1, Uniform Delay [s]	3.70	4.79	4.74	3.45	5.30	5.21	44.30	42.35
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.83	0.84	0.07	1.19	1.18	3.74	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.40	0.39	0.04	0.49	0.47	0.78	0.57
d, Delay for Lane Group [s/veh]	3.98	5.61	5.58	3.52	6.50	6.39	48.04	43.75
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.95	4.11	3.79	0.27	5.63	5.09	7.74	5.42
50th-Percentile Queue Length [ft/ln]	23.85	102.87	94.75	6.69	140.74	127.21	193.46	135.46
95th-Percentile Queue Length [veh/ln]	1.72	7.41	6.82	0.48	9.52	8.79	12.30	9.24
95th-Percentile Queue Length [ft/ln]	42.93	185.17	170.55	12.05	238.02	219.69	307.52	230.89

**Movement, Approach, & Intersection Results**

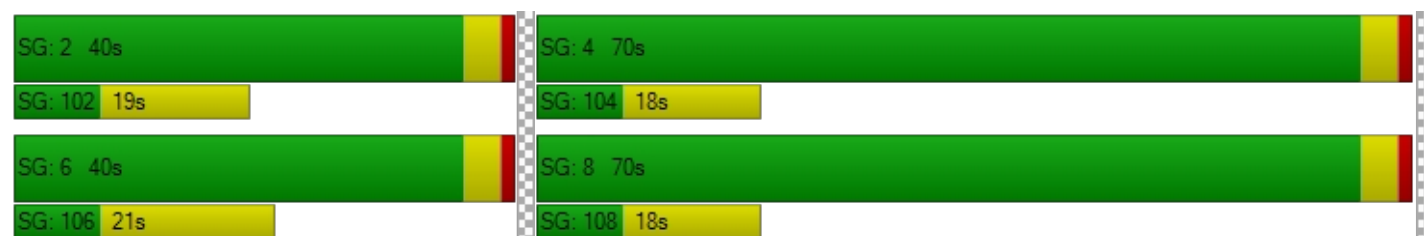
d_M, Delay for Movement [s/veh]	3.98	5.60	5.58	3.52	6.45	6.39	48.04	48.04	48.04	43.75	43.75	43.75
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.38			6.34			48.04			43.75		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.15											
Intersection LOS	B											
Intersection V/C	0.563											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.022			2.933			2.271			1.981		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			655			1200			1200		
d_b, Bicycle Delay [s]	24.89			24.89			8.80			8.80		
I_b,int, Bicycle LOS Score for Intersection	2.601			2.706			2.020			1.904		
Bicycle LOS	B			B			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	92.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.021

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	250	1637	297	289	1627	219	292	902	344	302	1082	293
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	1637	297	289	1627	219	292	902	344	302	1082	293
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	409	74	72	407	55	73	226	86	76	271	73
Total Analysis Volume [veh/h]	250	1637	297	289	1627	219	292	902	344	302	1082	293
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	42	0	11	42	0	19	39	0	18	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	38	38	7	38	38	15	35	35	14	34	34
g / C, Green / Cycle	0.06	0.35	0.35	0.06	0.35	0.35	0.14	0.32	0.32	0.13	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.07	0.43	0.17	0.08	0.40	0.19	0.16	0.16	0.19	0.17	0.19	0.16
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1311	621	223	1311	621	249	1804	570	233	1752	553
d1, Uniform Delay [s]	51.50	36.02	28.26	51.50	36.02	29.16	47.38	30.53	31.77	47.88	32.57	31.52
k, delay calibration	0.11	0.18	0.11	0.11	0.14	0.13	0.15	0.50	0.50	0.17	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	67.89	114.25	0.57	140.91	68.61	0.91	90.09	0.99	4.70	143.91	1.64	3.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.12	1.25	0.48	1.30	1.15	0.55	1.17	0.50	0.60	1.30	0.62	0.53
d, Delay for Lane Group [s/veh]	119.39	150.27	28.83	192.41	104.63	30.07	137.48	31.53	36.47	191.79	34.21	35.12
Lane Group LOS	F	F	C	F	F	C	F	C	D	F	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.16	37.95	6.19	7.42	29.63	7.42	13.03	6.59	8.39	15.67	8.39	6.94
50th-Percentile Queue Length [ft/ln]	129.05	948.64	154.73	185.54	740.85	185.61	325.70	164.72	209.75	391.65	209.87	173.59
95th-Percentile Queue Length [veh/ln]	9.19	55.12	10.27	12.79	42.13	11.89	20.28	10.80	13.14	24.56	13.15	11.27
95th-Percentile Queue Length [ft/ln]	229.81	1377.90	256.73	319.86	1053.24	297.32	506.88	269.96	328.51	614.06	328.67	281.63

**Movement, Approach, & Intersection Results**

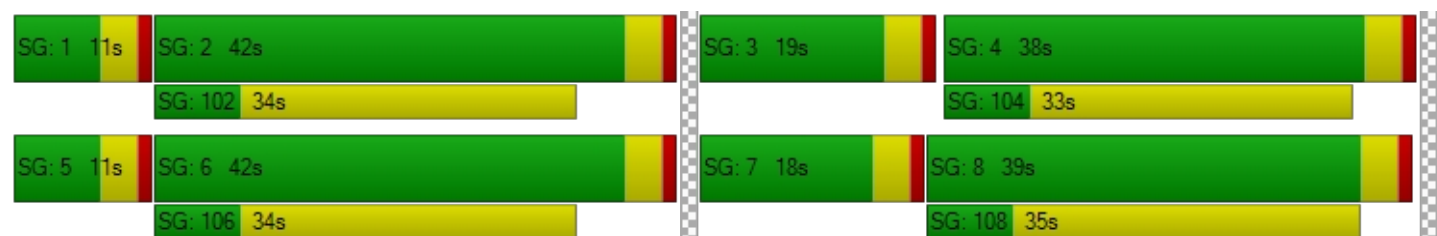
d_M, Delay for Movement [s/veh]	119.39	150.27	28.83	192.41	98.93	30.07	137.48	31.53	36.47	191.79	34.21	35.12
Movement LOS	F	F	C	F	F	C	F	C	D	F	C	D
d_A, Approach Delay [s/veh]	130.22			104.52			52.75			62.75		
Approach LOS	F			F			D			E		
d_I, Intersection Delay [s/veh]	92.10											
Intersection LOS	F											
Intersection V/C	1.021											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.278			3.210			3.111			3.121		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			636			618		
d_b, Bicycle Delay [s]	23.56			23.56			25.57			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.361			2.734			2.406			2.482		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	44.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.011

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	356	1050	135	195	1139	198	226	864	347	360	893	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	356	1050	135	195	1139	198	226	864	347	360	893	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	263	34	49	285	50	57	216	87	90	223	53
Total Analysis Volume [veh/h]	356	1050	135	195	1139	198	226	864	347	360	893	210
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	37	0	16	38	0	18	40	0	17	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	35	35	49	34	34	14	36	36	13	35	35
g / C, Green / Cycle	0.45	0.32	0.32	0.45	0.31	0.31	0.13	0.33	0.33	0.12	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.20	0.28	0.08	0.11	0.30	0.11	0.13	0.23	0.19	0.10	0.31	0.29
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	365	1224	580	429	1173	556	232	1241	588	417	602	570
d1, Uniform Delay [s]	21.11	34.92	27.32	18.99	37.53	29.53	47.71	32.27	30.89	47.57	36.98	36.18
k, delay calibration	0.17	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.34	1.86	0.20	0.75	7.15	0.39	21.63	3.24	4.31	5.43	28.98	21.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	0.86	0.23	0.45	0.97	0.36	0.97	0.70	0.59	0.86	0.96	0.92
d, Delay for Lane Group [s/veh]	43.45	36.79	27.53	19.74	44.68	29.92	69.33	35.51	35.19	53.00	65.95	58.04
Lane Group LOS	D	D	C	B	D	C	E	D	D	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.51	13.24	2.63	3.17	15.99	4.12	7.53	10.45	8.31	5.14	19.87	16.69
50th-Percentile Queue Length [ft/ln]	212.65	331.10	65.84	79.14	399.84	102.90	188.35	261.18	207.64	128.44	496.85	417.33
95th-Percentile Queue Length [veh/ln]	13.29	19.21	4.74	5.70	22.55	7.41	12.04	15.75	13.03	8.86	27.19	23.39
95th-Percentile Queue Length [ft/ln]	332.23	480.31	118.51	142.46	563.80	185.22	300.88	393.70	325.80	221.38	679.63	584.85

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	43.45	36.79	27.53	19.74	44.68	29.92	69.33	35.51	35.19	53.00	63.19	58.04
Movement LOS	D	D	C	B	D	C	E	D	D	D	E	E
d_A, Approach Delay [s/veh]	37.51			39.60			40.76			59.94		
Approach LOS	D			D			D			E		
d_I, Intersection Delay [s/veh]	44.32											
Intersection LOS	D											
Intersection V/C	1.011											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.013			2.953			3.097			3.068		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			618			655			636		
d_b, Bicycle Delay [s]	26.95			26.25			24.89			25.57		
I_b,int, Bicycle LOS Score for Intersection	2.831			2.824			2.350			2.767		
Bicycle LOS	C			C			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.950

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	523	0	0	433	234	0	0	0	59	105	126
Total Analysis Volume [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	67	0	0	57	0	0	0	0	0	33	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.04	0.37	0.46	0.52		0.13	0.11	0.28
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3591	2018	956		522	1102	522
d1, Uniform Delay [s]	45.89	10.82	20.19	22.91		29.03	28.33	35.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.74	0.70	4.98	24.51		0.62	0.22	28.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.58	0.86	0.98		0.45	0.38	0.97
d, Delay for Lane Group [s/veh]	48.63	11.52	25.16	47.43		29.65	28.55	63.26
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.56	8.38	17.48	26.26		4.69	4.00	15.91
50th-Percentile Queue Length [ft/ln]	39.04	209.60	437.02	656.58		117.14	99.95	397.81
95th-Percentile Queue Length [veh/ln]	2.81	13.13	24.34	34.67		8.24	7.20	22.45
95th-Percentile Queue Length [ft/ln]	70.28	328.32	608.44	866.69		205.88	179.91	561.37

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.63	11.52	0.00	0.00	25.16	47.43	0.00	0.00	0.00	29.65	28.55	63.26
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	13.58			32.98			0.00			43.87		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	27.96											
Intersection LOS	C											
Intersection V/C	0.950											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.440	2.419
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1260	1060	0	580
d_b, Bicycle Delay [s]	6.85	11.05	50.00	25.21
I_b,int, Bicycle LOS Score for Intersection	2.778	3.026	4.132	2.517
Bicycle LOS	C	C	D	B

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	48.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.040

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	266	0	0	343	97	0	0	0	36	176	237
Total Analysis Volume [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	45	0	0	35	0	0	0	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	41	31	31		51	51	51
g / C, Green / Cycle	0.06	0.41	0.31	0.31		0.51	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.06	0.19	0.31	0.33		0.24	0.22	0.53
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2343	1180	559		916	967	916
d1, Uniform Delay [s]	46.98	21.32	34.38	34.47		15.85	15.43	24.55
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	45.21	0.64	24.84	51.66		0.38	0.30	39.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.02	0.45	0.99	1.05		0.47	0.43	1.04
d, Delay for Lane Group [s/veh]	92.19	21.96	59.22	86.13		16.22	15.73	63.83
Lane Group LOS	F	C	E	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.06	6.02	17.88	21.22		6.17	5.79	30.04
50th-Percentile Queue Length [ft/ln]	101.42	150.52	447.11	530.49		154.34	144.84	750.90
95th-Percentile Queue Length [veh/ln]	7.30	10.05	24.82	29.69		10.25	9.74	40.15
95th-Percentile Queue Length [ft/ln]	182.55	251.13	620.50	742.26		256.21	243.53	1003.74

**Movement, Approach, & Intersection Results**

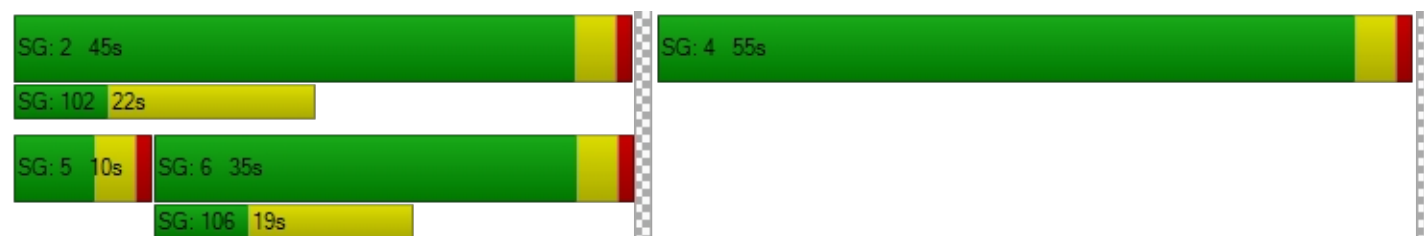
d_M, Delay for Movement [s/veh]	92.19	21.96	0.00	0.00	63.10	86.13	0.00	0.00	0.00	16.22	15.93	63.83
Movement LOS	F	C			E	F				B	B	F
d_A, Approach Delay [s/veh]	28.60			68.19			0.00			41.28		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	48.14											
Intersection LOS	D											
Intersection V/C	1.040											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.306			2.528		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	820			620			0			1020		
d_b, Bicycle Delay [s]	17.41			23.81			50.00			12.01		
I_b,int, Bicycle LOS Score for Intersection	2.206			2.528			4.132			3.040		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.810

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	315	75	163	337	0	267	63	49	0	0	0
Total Analysis Volume [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	31	0	27	58	0	0	42	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	33	33	21	58	34	34	34	
g / C, Green / Cycle	0.33	0.33	0.21	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.17	0.19	0.24	0.31	0.13	0.11	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	1889	596	729	3304	1191	647	613	
d1, Uniform Delay [s]	28.69	26.81	38.52	11.58	31.32	25.10	24.43	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.88	2.99	4.16	0.38	2.69	0.39	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.67	0.50	0.89	0.41	0.90	0.39	0.32	
d, Delay for Lane Group [s/veh]	30.58	29.80	42.68	11.95	34.01	25.48	24.73	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.78	6.12	8.08	5.30	12.33	4.58	3.47	
50th-Percentile Queue Length [ft/ln]	219.49	153.03	201.94	132.38	308.16	114.38	86.66	
95th-Percentile Queue Length [veh/ln]	13.64	10.18	12.74	9.07	18.08	8.08	6.24	
95th-Percentile Queue Length [ft/ln]	340.97	254.47	318.47	226.72	452.11	202.08	155.99	

**Movement, Approach, & Intersection Results**

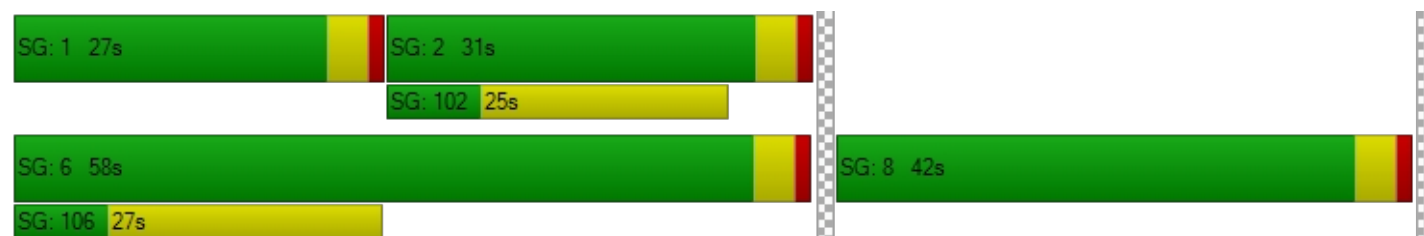
d_M, Delay for Movement [s/veh]	0.00	30.58	29.80	42.68	11.95	0.00	34.01	25.48	24.73	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	30.43			21.97			31.39			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	27.38											
Intersection LOS	C											
Intersection V/C	0.810											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.506			2.307		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	540			1080			760			0		
d_b, Bicycle Delay [s]	26.65			10.58			19.22			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.660			4.066			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	199	47	188	214	0	59	234	17	0	0	0
Total Analysis Volume [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	25	0	29	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	29	29	24	56	36	36	36	
g / C, Green / Cycle	0.29	0.29	0.24	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.18	0.21	0.23	0.33	0.30	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1088	515	823	2133	646	682	646	
d1, Uniform Delay [s]	30.78	31.14	37.24	12.43	30.62	29.56	21.37	
k, delay calibration	0.50	0.50	0.11	0.50	0.30	0.26	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.47	5.88	4.39	0.57	13.49	6.96	0.07	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.64	0.91	0.40	0.92	0.85	0.11	
d, Delay for Lane Group [s/veh]	33.25	37.02	41.63	12.99	44.11	36.52	21.44	
Lane Group LOS	C	D	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	7.07	7.62	9.27	5.31	15.57	13.74	1.07	
50th-Percentile Queue Length [ft/ln]	176.83	190.49	231.69	132.87	389.25	343.44	26.69	
95th-Percentile Queue Length [veh/ln]	11.43	12.15	14.26	9.10	22.04	19.82	1.92	
95th-Percentile Queue Length [ft/ln]	285.87	303.67	356.51	227.39	551.03	495.40	48.05	

**Movement, Approach, & Intersection Results**

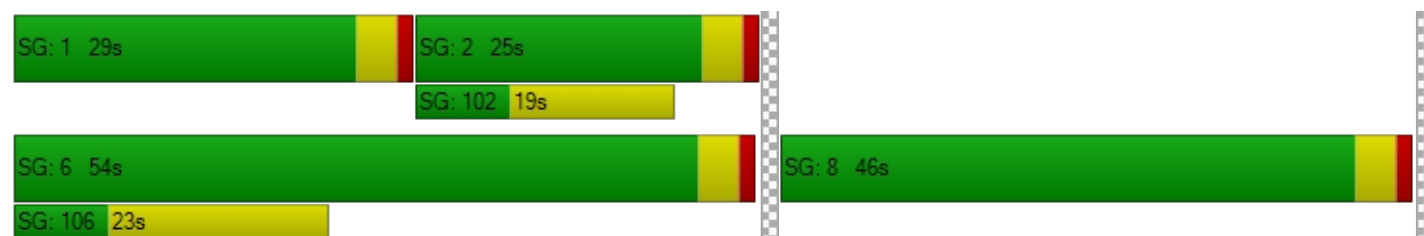
d_M, Delay for Movement [s/veh]	0.00	33.92	37.02	41.63	12.99	0.00	44.11	39.41	21.44	0.00	0.00	0.00
Movement LOS		C	D	D	B		D	D	C			
d_A, Approach Delay [s/veh]	34.51			26.36			39.32			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	32.64											
Intersection LOS	C											
Intersection V/C	0.824											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.347			2.631		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	420			1000			840			0		
d_b, Bicycle Delay [s]	31.21			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.100			2.885			2.581			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.065

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	45	348	17	9	570
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	45	348	17	9	570
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	11	87	4	2	143
Total Analysis Volume [veh/h]	0	45	348	17	9	570
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**



V/C, Movement V/C Ratio	0.00	0.06	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	0.00	10.54	0.00	0.00	8.04	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.21	0.00	0.00	0.02	0.00
95th-Percentile Queue Length [ft/ln]	0.00	5.18	0.00	0.00	0.57	0.00
d_A, Approach Delay [s/veh]	10.54		0.00		0.12	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.280

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	566	47	18	486	0	32	0	65	138	0	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	566	47	18	486	0	32	0	65	138	0	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	142	12	5	122	0	8	0	16	35	0	12
Total Analysis Volume [veh/h]	0	566	47	18	486	0	32	0	65	138	0	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	56	0	10	66	0	0	44	0	44	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	85	85	91	91	11	11	11	11
g / C, Green / Cycle	0.77	0.77	0.83	0.83	0.10	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.16	0.17	0.01	0.13	0.02	0.04	0.08	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1465	1388	1495	3159	208	205	148	173
d1, Uniform Delay [s]	3.44	3.48	1.58	1.79	45.76	46.63	48.67	46.15
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.32	0.37	0.00	0.10	0.34	0.87	20.90	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.21	0.22	0.01	0.15	0.15	0.32	0.93	0.27
d, Delay for Lane Group [s/veh]	3.76	3.84	1.58	1.90	46.09	47.50	69.57	46.99
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.63	1.65	0.04	0.68	0.83	1.72	4.56	1.23
50th-Percentile Queue Length [ft/ln]	40.72	41.36	1.06	16.91	20.64	42.96	113.98	30.86
95th-Percentile Queue Length [veh/ln]	2.93	2.98	0.08	1.22	1.49	3.09	8.06	2.22
95th-Percentile Queue Length [ft/ln]	73.29	74.44	1.91	30.44	37.15	77.32	201.52	55.54

**Movement, Approach, & Intersection Results**

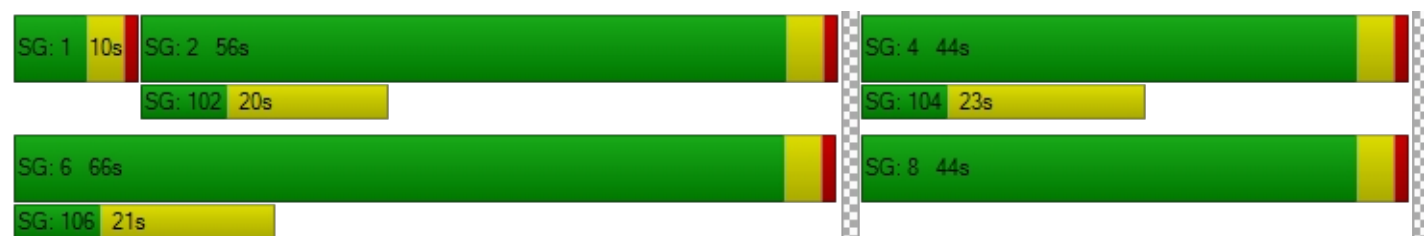
d_M, Delay for Movement [s/veh]	0.00	3.80	3.84	1.58	1.90	0.00	46.09	47.50	47.50	69.57	0.00	46.99
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	3.80			1.89			47.04			63.83		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.05											
Intersection LOS	B											
Intersection V/C	0.280											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.579			1.772			2.051		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			1127			727			0		
d_b, Bicycle Delay [s]	15.29			10.47			22.27			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.065			1.975			1.720			4.132		
Bicycle LOS	B			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.064

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	62	432	304	2	31	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	432	304	2	31	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	108	76	1	8	2
Total Analysis Volume [veh/h]	62	432	304	2	31	7
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.06	0.01
d_M, Delay for Movement [s/veh]	8.02	0.00	0.00	0.00	13.02	10.46
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.16	0.00	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft/ln]	3.89	0.00	0.00	0.00	5.95	5.95
d_A, Approach Delay [s/veh]	1.01		0.00		12.54	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.16					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	489	318	0	8	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	489	318	0	8	116
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	122	80	0	2	29
Total Analysis Volume [veh/h]	0	489	318	0	8	116
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**




V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.02	0.16
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	12.88	11.07
Movement LOS		A	A		B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.63	0.63
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	15.84	15.84
d_A, Approach Delay [s/veh]	0.00		0.00		11.18	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.49					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.063

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	468	35	23	337	32	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	468	35	23	337	32	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	117	9	6	84	8	5
Total Analysis Volume [veh/h]	468	35	23	337	32	19
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.06	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	8.47	0.00	12.82	11.90
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.07	0.00	0.32	0.32
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.66	0.00	7.90	7.90
d_A, Approach Delay [s/veh]	0.00		0.54		12.48	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.91					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	568	48	0	486	6	0	0	29	0	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	568	48	0	486	6	0	0	29	0	0	46
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	142	12	0	122	2	0	0	7	0	0	12
Total Analysis Volume [veh/h]	6	568	48	0	486	6	0	0	29	0	0	46
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	8.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.96	0.00	0.00	10.61
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.21
95th-Percentile Queue Length [ft/ln]	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.99	0.00	0.00	5.36
d_A, Approach Delay [s/veh]	0.08			0.00			9.96			10.61		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	0.70											
Intersection LOS	B											





*APPENDIX G-III*

**YEAR 2030 BUILDOUT SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	37.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	133	852	103	200	893	206	217	805	157	203	814	187
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	852	103	200	893	206	217	805	157	203	814	187
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	213	26	50	223	52	54	201	39	51	204	47
Total Analysis Volume [veh/h]	133	852	103	200	893	206	217	805	157	203	814	187
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	16	46	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	56	56	6	56	56	12	24	24	8	20	20
g / C, Green / Cycle	0.05	0.51	0.51	0.05	0.51	0.51	0.11	0.22	0.22	0.07	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.04	0.15	0.06	0.06	0.20	0.20	0.12	0.17	0.17	0.06	0.14	0.10
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	194	2890	913	194	1927	913	197	831	394	257	1041	329
d1, Uniform Delay [s]	51.07	15.73	14.19	52.00	16.63	16.66	49.02	40.50	40.69	50.17	42.91	41.04
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.27	0.26	0.25	38.70	0.59	1.25	60.87	1.63	3.72	5.38	1.32	1.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.29	0.11	1.03	0.39	0.39	1.10	0.78	0.80	0.79	0.78	0.57
d, Delay for Lane Group [s/veh]	55.33	15.99	14.44	90.71	17.22	17.91	109.89	42.13	44.41	55.55	44.23	42.59
Lane Group LOS	E	B	B	F	B	B	F	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.91	4.13	1.39	3.71	5.78	5.69	8.73	8.39	8.39	2.93	7.13	4.76
50th-Percentile Queue Length [ft/ln]	47.81	103.24	34.80	92.69	144.56	142.29	218.29	209.86	209.68	73.36	178.15	118.88
95th-Percentile Queue Length [veh/ln]	3.44	7.43	2.51	6.67	9.73	9.60	14.09	13.15	13.14	5.28	11.50	8.33
95th-Percentile Queue Length [ft/ln]	86.06	185.83	62.64	166.85	243.15	240.10	352.29	328.65	328.42	132.05	287.60	208.29



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	55.33	15.99	14.44	90.71	17.33	17.91	109.89	42.58	44.41	55.55	44.23	42.59
Movement LOS	E	B	B	F	B	B	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	20.65			28.72			55.21			45.88		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	37.76											
Intersection LOS	D											
Intersection V/C	0.583											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.112			3.046			2.928			3.109		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			764			691		
d_b, Bicycle Delay [s]	23.56			23.56			21.02			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.158			2.274			2.208			2.222		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	7	971	600	58	1254	12	30	97	15	612	68	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	971	600	58	1254	12	30	97	15	612	68	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	243	150	15	314	3	8	24	4	153	17	0
Total Analysis Volume [veh/h]	7	971	600	58	1254	12	30	97	15	612	68	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	31	0	15	31	0	0	30	0	0	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	58	5	62	62	8	8	8	24	24
g / C, Green / Cycle	0.01	0.53	0.05	0.56	0.56	0.07	0.07	0.07	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.00	0.17	0.03	0.27	0.14	0.02	0.05	0.01	0.19	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	21	2987	83	2123	1006	127	134	127	385	385
d1, Uniform Delay [s]	53.99	15.03	51.75	14.63	12.46	48.36	50.11	47.95	41.91	41.99
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.22	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.16	0.29	10.02	0.77	0.59	0.94	7.16	0.41	12.43	13.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.33	0.70	0.48	0.25	0.24	0.72	0.12	0.88	0.89
d, Delay for Lane Group [s/veh]	63.15	15.32	61.77	15.41	13.05	49.30	57.28	48.36	54.34	55.23
Lane Group LOS	E	B	E	B	B	D	E	D	D	E
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.25	4.62	1.81	7.55	3.24	0.81	2.88	0.40	10.15	10.33
50th-Percentile Queue Length [ft/ln]	6.13	115.48	45.17	188.86	81.07	20.31	71.94	10.02	253.84	258.21
95th-Percentile Queue Length [veh/ln]	0.44	8.14	3.25	12.06	5.84	1.46	5.18	0.72	15.38	15.60
95th-Percentile Queue Length [ft/ln]	11.03	203.59	81.31	301.56	145.93	36.56	129.49	18.03	384.48	389.97

**Movement, Approach, & Intersection Results**

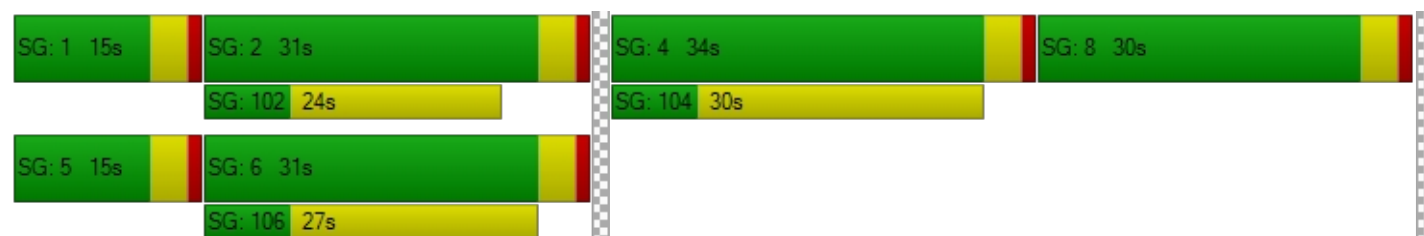
d_M, Delay for Movement [s/veh]	63.15	15.32	0.00	61.77	14.96	13.05	49.30	57.28	48.36	54.73	55.23	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	E	
d_A, Approach Delay [s/veh]	15.67			16.99			54.65			54.78		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.51											
Intersection LOS	C											
Intersection V/C	0.599											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.927			2.196			2.221		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			473			545		
d_b, Bicycle Delay [s]	31.31			31.31			32.07			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.098			2.288			1.794			2.682		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	16.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	28	1365	36	164	1701	3	22	67	26	47	97	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1365	36	164	1701	3	22	67	26	47	97	241
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	341	9	41	425	1	6	17	7	12	24	60
Total Analysis Volume [veh/h]	28	1365	36	164	1701	3	22	67	26	47	97	241
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	35	35	0	35	35	0	0	40	0	0	40	40
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	3	68	68	15	80	80	15	15	15	15	15	33
g / C, Green / Cycle	0.03	0.62	0.62	0.13	0.73	0.73	0.13	0.13	0.13	0.13	0.13	0.30
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.38	0.05	0.45	0.00	0.01	0.04	0.01	0.03	0.05	0.13
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	58	1183	1121	470	2754	1305	192	254	241	218	254	548
d1, Uniform Delay [s]	52.31	12.61	12.56	43.25	7.54	4.17	41.76	42.76	41.85	42.35	43.47	30.72
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.07	2.35	2.43	0.44	1.05	0.00	0.26	0.55	0.20	0.49	0.94	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.61	0.61	0.35	0.62	0.00	0.11	0.26	0.11	0.22	0.38	0.44
d, Delay for Lane Group [s/veh]	58.38	14.96	14.99	43.69	8.59	4.18	42.02	43.30	42.05	42.84	44.41	31.27
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	10.83	10.18	2.06	8.89	0.02	0.54	1.68	0.64	1.17	2.48	5.19
50th-Percentile Queue Length [ft/ln]	21.43	270.81	254.44	51.41	222.20	0.44	13.48	41.90	15.88	29.18	61.91	129.87
95th-Percentile Queue Length [veh/ln]	1.54	16.23	15.41	3.70	13.78	0.03	0.97	3.02	1.14	2.10	4.46	8.93
95th-Percentile Queue Length [ft/ln]	38.58	405.75	385.24	92.54	344.44	0.80	24.26	75.42	28.58	52.53	111.43	223.32



**Movement, Approach, & Intersection Results**

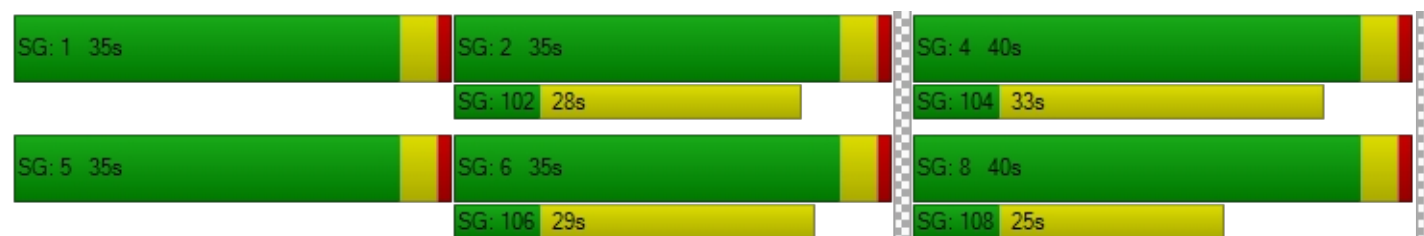
d_M, Delay for Movement [s/veh]	58.38	14.98	14.99	43.69	8.59	4.18	42.02	43.30	42.05	42.84	44.41	31.27
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	15.83			11.67			42.77			35.99		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	16.64											
Intersection LOS	B											
Intersection V/C	0.647											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.001			3.122			2.200			2.437		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			564			655			655		
d_b, Bicycle Delay [s]	28.37			28.37			24.89			24.89		
I_b,int, Bicycle LOS Score for Intersection	2.739			3.101			1.749			2.195		
Bicycle LOS	B			C			A			B		

**Sequence**





Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.432

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	151	225	50	64	256	30	21	191	105	63	216	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	225	50	64	256	30	21	191	105	63	216	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	56	13	16	64	8	5	48	26	16	54	16
Total Analysis Volume [veh/h]	151	225	50	64	256	30	21	191	105	63	216	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	36	0	0	44	0	0	30	30	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	42	42	42	42	13	13	60	13	13	13
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.12	0.12	0.54	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.03	0.04	0.16	0.01	0.10	0.06	0.04	0.08	0.07
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	691	691	691	691	691	134	234	978	90	234	222
d1, Uniform Delay [s]	22.77	23.83	21.45	21.62	24.80	42.75	46.97	12.17	43.78	45.80	45.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.73	1.25	0.20	0.27	1.83	0.54	6.85	0.22	9.38	2.78	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.22	0.33	0.07	0.09	0.41	0.16	0.82	0.11	0.70	0.63	0.60
d, Delay for Lane Group [s/veh]	23.49	25.09	21.65	21.89	26.62	43.29	53.82	12.39	53.16	48.57	48.21
Lane Group LOS	C	C	C	C	C	D	D	B	D	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	2.76	4.33	0.86	1.11	5.76	0.53	5.52	1.29	1.80	3.99	3.59
50th-Percentile Queue Length [ft/ln]	69.10	108.37	21.45	27.69	144.12	13.21	138.06	32.36	44.90	99.86	89.73
95th-Percentile Queue Length [veh/ln]	4.98	7.75	1.54	1.99	9.70	0.95	9.38	2.33	3.23	7.19	6.46
95th-Percentile Queue Length [ft/ln]	124.38	193.73	38.60	49.84	242.56	23.77	234.42	58.25	80.81	179.75	161.52

**Movement, Approach, & Intersection Results**

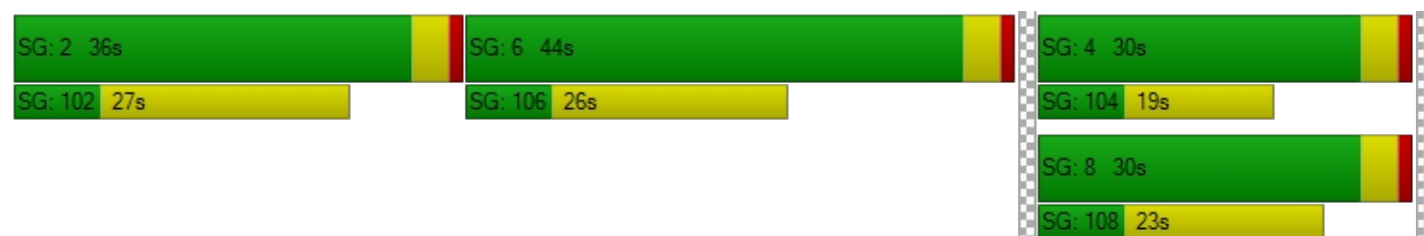
d_M, Delay for Movement [s/veh]	23.49	25.09	21.65	21.89	26.62	26.62	43.29	53.82	12.39	53.16	48.46	48.21
Movement LOS	C	C	C	C	C	C	D	D	B	D	D	D
d_A, Approach Delay [s/veh]	24.12			25.76			39.40			49.27		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.90											
Intersection LOS	C											
Intersection V/C	0.432											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.437			2.194			2.449			2.299		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			727			473			473		
d_b, Bicycle Delay [s]	27.65			22.27			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.263			2.137			2.083			1.843		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.207

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	130	97	227	205	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	130	97	227	205	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	33	24	57	51	3
Total Analysis Volume [veh/h]	17	130	97	227	205	12
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.12	0.11	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	164	164	1487	1588	1588	1505
d1, Uniform Delay [s]	45.79	48.89	1.56	1.68	1.66	1.49
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	8.27	0.08	0.19	0.17	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.07	0.14	0.13	0.01
d, Delay for Lane Group [s/veh]	46.06	57.16	1.65	1.87	1.82	1.50
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.44	3.86	0.25	0.63	0.56	0.03
50th-Percentile Queue Length [ft/ln]	10.98	96.52	6.32	15.78	14.06	0.74
95th-Percentile Queue Length [veh/ln]	0.79	6.95	0.46	1.14	1.01	0.05
95th-Percentile Queue Length [ft/ln]	19.76	173.73	11.38	28.41	25.31	1.34



**Movement, Approach, & Intersection Results**

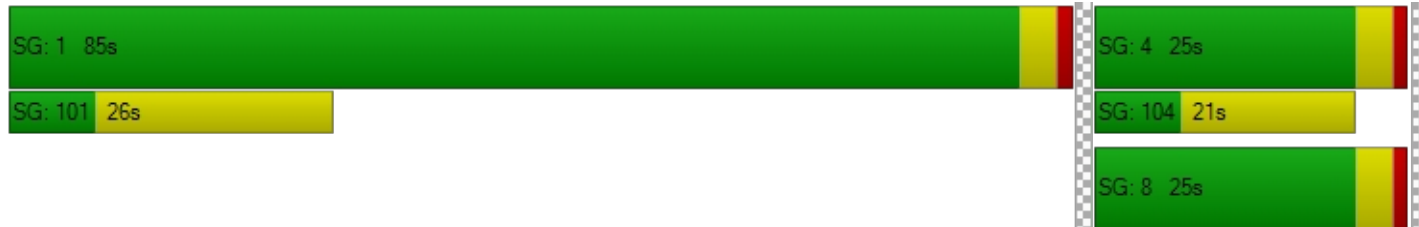
d_M, Delay for Movement [s/veh]	46.06	57.16	1.65	1.87	1.82	1.50
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.87		1.80		1.81	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	13.36					
Intersection LOS	B					
Intersection V/C	0.207					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.171	2.164	2.100
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.667	4.490
Bicycle LOS	D	E	E

**Sequence**





Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.537

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	70	1163	49	61	1160	64	61	220	84	46	234	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	1163	49	61	1160	64	61	220	84	46	234	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	291	12	15	290	16	15	55	21	12	59	17
Total Analysis Volume [veh/h]	70	1163	49	61	1160	64	61	220	84	46	234	67
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	30	0	10	29	0	10	30	0	40	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	81	72	72	81	72	72	21	12	12	21	12	12
g / C, Green / Cycle	0.74	0.65	0.65	0.74	0.65	0.65	0.19	0.11	0.11	0.19	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.33	0.03	0.33	0.33	0.03	0.08	0.08	0.03	0.08	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1085	1242	1176	1092	1238	1173	300	213	202	297	204	193
d1, Uniform Delay [s]	3.97	9.86	9.80	3.95	10.03	9.95	37.34	47.42	47.16	37.02	47.87	47.67
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	1.47	1.51	0.02	1.52	1.55	0.33	5.38	4.57	0.24	6.26	5.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.50	0.50	0.06	0.51	0.50	0.20	0.76	0.71	0.15	0.78	0.74
d, Delay for Lane Group [s/veh]	4.08	11.33	11.31	3.97	11.55	11.50	37.67	52.80	51.73	37.26	54.13	53.17
Lane Group LOS	A	B	B	A	B	B	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.41	7.68	7.15	0.33	7.88	7.30	1.41	4.58	4.03	1.05	4.57	4.08
50th-Percentile Queue Length [ft/ln]	10.22	191.88	178.82	8.27	196.90	182.41	35.23	114.50	100.84	26.32	114.14	102.12
95th-Percentile Queue Length [veh/ln]	0.74	12.22	11.54	0.60	12.48	11.73	2.54	8.09	7.26	1.90	8.07	7.35
95th-Percentile Queue Length [ft/ln]	18.39	305.47	288.48	14.89	311.96	293.15	63.42	202.24	181.51	47.38	201.75	183.81

**Movement, Approach, & Intersection Results**

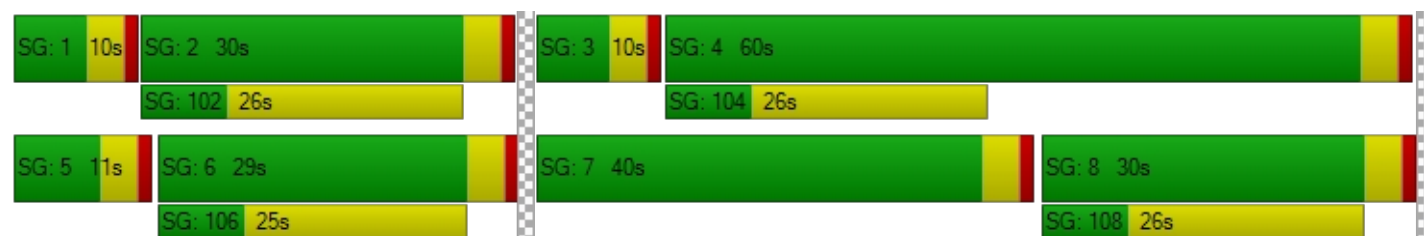
d_M, Delay for Movement [s/veh]	4.08	11.32	11.31	3.97	11.52	11.50	37.67	52.51	51.73	37.26	53.82	53.17
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.92			11.16			49.85			51.50		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	19.64											
Intersection LOS	B											
Intersection V/C	0.537											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.819			2.823			2.519			2.500		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			455			473			1018		
d_b, Bicycle Delay [s]	32.07			32.84			32.07			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.617			2.620			1.861			1.846		
Bicycle LOS	B			B			A			A		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	146	1221	188	186	1307	151	216	616	149	284	714	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	146	1221	188	186	1307	151	216	616	149	284	714	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	305	47	47	327	38	54	154	37	71	179	36
Total Analysis Volume [veh/h]	146	1221	188	186	1307	151	216	616	149	284	714	142
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	48	0	12	50	0	15	39	0	11	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	51	51	63	53	53	39	28	28	39	24	24
g / C, Green / Cycle	0.57	0.47	0.47	0.57	0.48	0.48	0.36	0.26	0.26	0.36	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.08	0.39	0.37	0.10	0.40	0.39	0.12	0.21	0.20	0.16	0.19	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	494	884	838	507	910	862	412	486	461	372	835	396
d1, Uniform Delay [s]	11.05	25.64	25.15	11.32	24.83	24.51	25.88	38.76	38.05	27.04	41.26	36.37
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.22	0.18	0.13	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.52	8.92	8.12	0.44	8.71	8.34	1.03	7.41	4.79	3.94	2.63	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.30	0.83	0.81	0.37	0.83	0.81	0.52	0.84	0.78	0.76	0.85	0.36
d, Delay for Lane Group [s/veh]	12.57	34.56	33.27	11.77	33.54	32.85	26.92	46.17	42.84	30.99	43.89	36.92
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.84	18.28	16.38	2.19	18.55	16.99	4.24	11.26	9.51	6.07	9.52	3.29
50th-Percentile Queue Length [ft/ln]	45.89	456.92	409.53	54.65	463.87	424.82	105.97	281.61	237.66	151.70	238.02	82.30
95th-Percentile Queue Length [veh/ln]	3.30	25.29	23.02	3.93	25.62	23.75	7.62	16.77	14.56	10.11	14.58	5.93
95th-Percentile Queue Length [ft/ln]	82.60	632.20	575.47	98.37	640.48	593.83	190.38	419.22	364.07	252.69	364.53	148.15



**Movement, Approach, & Intersection Results**

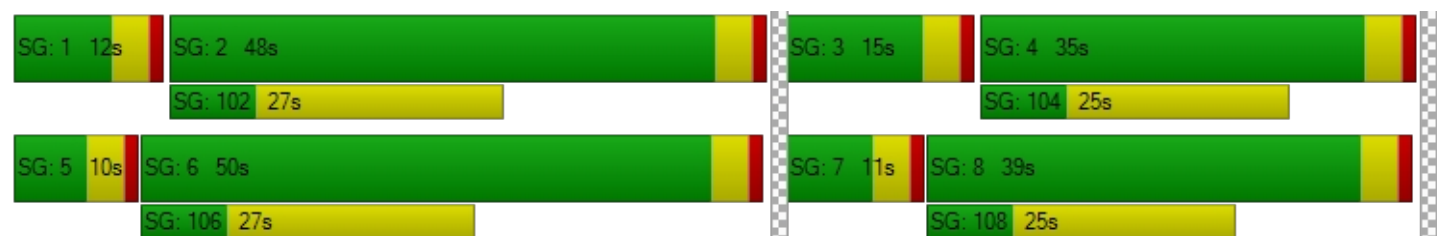
d_M, Delay for Movement [s/veh]	12.57	34.05	33.27	11.77	33.25	32.85	26.92	45.04	42.84	30.99	43.89	36.92
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	31.94			30.78			40.71			39.81		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.88											
Intersection LOS	C											
Intersection V/C	0.883											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.098			3.011			2.801			2.937		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			836			636			564		
d_b, Bicycle Delay [s]	19.80			18.62			25.57			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.842			2.916			2.369			2.500		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	358	155	78	392	138	137	800	138	246	864	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	358	155	78	392	138	137	800	138	246	864	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	90	39	20	98	35	34	200	35	62	216	11
Total Analysis Volume [veh/h]	116	358	155	78	392	138	137	800	138	246	864	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	14	52	0	16	54	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	47	47	56	47	47	10	32	32	10	32	32
g / C, Green / Cycle	0.51	0.43	0.43	0.51	0.42	0.42	0.09	0.29	0.29	0.09	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.06	0.09	0.09	0.04	0.15	0.14	0.08	0.26	0.25	0.07	0.23	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	828	1616	765	904	801	759	165	551	522	312	1093	518
d1, Uniform Delay [s]	14.02	20.08	19.90	13.71	21.62	21.33	49.18	37.52	36.86	49.11	36.17	28.61
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.15	0.12	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	0.32	0.60	0.04	1.22	1.14	10.26	7.25	4.60	4.41	1.33	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.22	0.20	0.09	0.35	0.33	0.83	0.90	0.85	0.79	0.79	0.08
d, Delay for Lane Group [s/veh]	14.37	20.40	20.50	13.75	22.84	22.47	59.44	44.77	41.46	53.52	37.50	28.68
Lane Group LOS	B	C	C	B	C	C	E	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.57	2.97	2.61	0.99	5.18	4.47	4.16	13.68	11.77	3.49	10.77	0.82
50th-Percentile Queue Length [ft/ln]	39.29	74.19	65.32	24.75	129.47	111.71	104.04	342.08	294.14	87.36	269.28	20.56
95th-Percentile Queue Length [veh/ln]	2.83	5.34	4.70	1.78	8.91	7.94	7.49	19.75	17.39	6.29	16.15	1.48
95th-Percentile Queue Length [ft/ln]	70.72	133.55	117.57	44.56	222.77	198.38	187.26	493.74	434.78	157.25	403.84	37.01

**Movement, Approach, & Intersection Results**

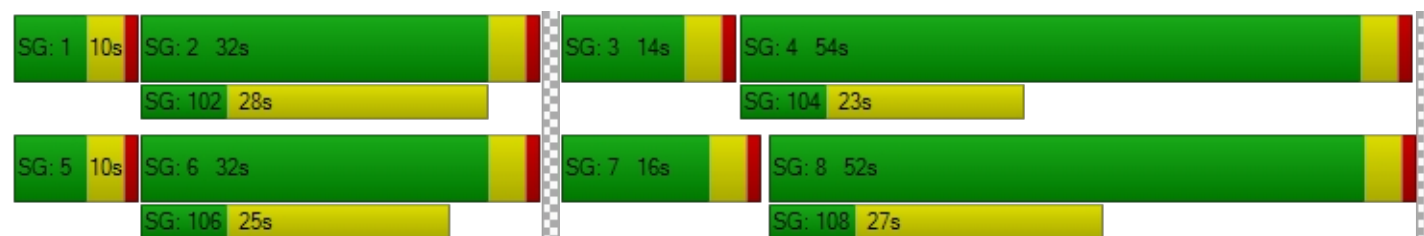
d_M, Delay for Movement [s/veh]	14.37	20.40	20.50	13.75	22.74	22.47	59.44	43.51	41.46	53.52	37.50	28.68
Movement LOS	B	C	C	B	C	C	E	D	D	D	D	C
d_A, Approach Delay [s/veh]	19.31			21.53			45.27			40.60		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	34.84											
Intersection LOS	C											
Intersection V/C	0.603											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.691			2.533			2.810			2.957		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			873			909		
d_b, Bicycle Delay [s]	30.56			30.56			17.47			16.36		
I_b,int, Bicycle LOS Score for Intersection	2.079			2.061			2.446			2.510		
Bicycle LOS	B			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.430

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	21	32	155	16	19	20	973	3	35	1207	152
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	21	32	155	16	19	20	973	3	35	1207	152
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	8	39	4	5	5	243	1	9	302	38
Total Analysis Volume [veh/h]	5	21	32	155	16	19	20	973	3	35	1207	152
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	8	17	85	85	85	79	79	90
g / C, Green / Cycle	0.05	0.05	0.05	0.07	0.15	0.78	0.78	0.78	0.72	0.72	0.82
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.02	0.04	0.02	0.01	0.26	0.26	0.02	0.32	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	88	87	82	241	272	1240	1475	1397	1162	2715	1476
d1, Uniform Delay [s]	50.24	50.66	51.01	49.92	40.45	2.78	3.74	3.74	4.57	6.57	1.95
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	1.42	2.97	2.86	0.21	0.01	0.63	0.66	0.05	0.53	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.24	0.39	0.64	0.13	0.02	0.34	0.34	0.03	0.44	0.10
d, Delay for Lane Group [s/veh]	50.51	52.08	53.98	52.77	40.66	2.79	4.37	4.40	4.62	7.10	1.98
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.59	0.92	2.17	0.84	0.08	2.94	2.80	0.22	5.35	0.45
50th-Percentile Queue Length [ft/ln]	3.46	14.81	23.11	54.25	20.99	2.04	73.52	69.88	5.58	133.70	11.15
95th-Percentile Queue Length [veh/ln]	0.25	1.07	1.66	3.91	1.51	0.15	5.29	5.03	0.40	9.14	0.80
95th-Percentile Queue Length [ft/ln]	6.22	26.66	41.59	97.64	37.79	3.67	132.34	125.79	10.05	228.52	20.06



**Movement, Approach, & Intersection Results**

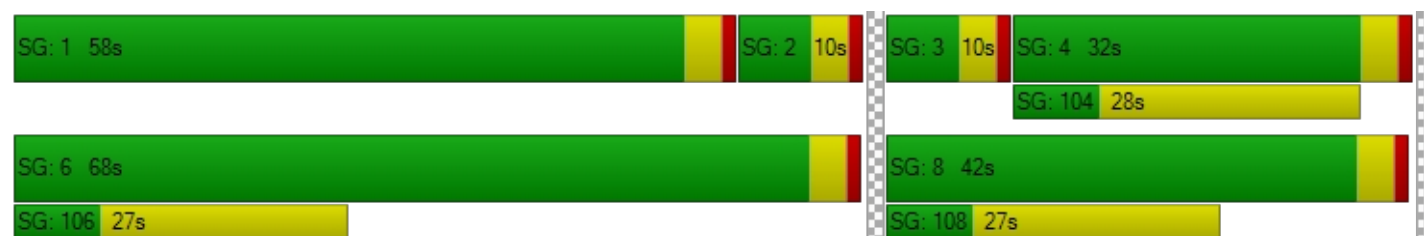
d_M, Delay for Movement [s/veh]	50.51	52.08	53.98	52.77	40.66	40.66	2.79	4.38	4.40	4.62	7.10	1.98
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.99			50.54			4.35			6.48		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.87											
Intersection LOS	A											
Intersection V/C	0.430											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.218			2.255			2.751			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.655			1.873			2.381			2.710		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.587

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	107	114	207	81	131	65	58	993	89	193	1177	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	114	207	81	131	65	58	993	89	193	1177	63
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	29	52	20	33	16	15	248	22	48	294	16
Total Analysis Volume [veh/h]	107	114	207	81	131	65	58	993	89	193	1177	63
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	61	0	10	61	0	11	29	0	10	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	15	15	25	15	15	77	67	67	77	68	68
g / C, Green / Cycle	0.23	0.14	0.14	0.23	0.14	0.14	0.70	0.61	0.61	0.70	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.12	0.05	0.05	0.05	0.03	0.30	0.29	0.11	0.34	0.33
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	419	266	252	410	257	244	996	1150	1089	1044	1175	1113
d1, Uniform Delay [s]	34.97	43.29	45.98	34.45	43.49	43.35	5.10	12.20	12.06	5.53	12.09	12.01
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.32	1.09	6.56	0.23	1.01	0.97	0.02	1.50	1.49	0.39	1.82	1.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.26	0.43	0.82	0.20	0.40	0.38	0.06	0.49	0.48	0.18	0.55	0.54
d, Delay for Lane Group [s/veh]	35.29	44.38	52.54	34.68	44.50	44.32	5.12	13.70	13.55	5.92	13.92	13.87
Lane Group LOS	D	D	D	C	D	D	A	B	B	A	B	B
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.40	2.92	5.93	1.79	2.65	2.36	0.38	7.82	7.12	1.47	9.07	8.44
50th-Percentile Queue Length [ft/ln]	59.96	72.97	148.33	44.68	66.25	59.01	9.55	195.38	178.11	36.66	226.87	210.98
95th-Percentile Queue Length [veh/ln]	4.32	5.25	9.93	3.22	4.77	4.25	0.69	12.40	11.50	2.64	14.02	13.20
95th-Percentile Queue Length [ft/ln]	107.93	131.35	248.20	80.42	119.25	106.23	17.18	310.00	287.54	65.99	350.38	330.09

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	35.29	44.38	52.54	34.68	44.46	44.32	5.12	13.63	13.55	5.92	13.90	13.87
Movement LOS	D	D	D	C	D	D	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	46.06			41.57			13.19			12.82		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	19.72											
Intersection LOS	B											
Intersection V/C	0.587											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.645			2.318			2.818			2.857		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1036			1036			455			436		
d_b, Bicycle Delay [s]	12.77			12.77			32.84			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.266			1.788			2.500			2.742		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	52	35	107	59	50	34	22	1156	37	50	1380	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	35	107	59	50	34	22	1156	37	50	1380	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	9	27	15	13	9	6	289	9	13	345	10
Total Analysis Volume [veh/h]	52	35	107	59	50	34	22	1156	37	50	1380	38
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	9	9	9	9	9	84	84	84	86	86	86
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.77	0.77	0.77	0.78	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.06	0.03	0.05	0.01	0.32	0.32	0.03	0.38	0.38
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	153	145	150	145	1206	1457	1381	1182	1488	1409
d1, Uniform Delay [s]	47.89	47.38	49.44	48.08	48.78	3.02	4.42	4.40	2.67	4.21	4.19
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.01	0.76	7.20	1.67	3.66	0.01	0.90	0.93	0.07	1.16	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	0.23	0.74	0.39	0.58	0.02	0.42	0.42	0.04	0.49	0.49
d, Delay for Lane Group [s/veh]	51.89	48.13	56.65	49.74	52.44	3.03	5.32	5.33	2.73	5.37	5.40
Lane Group LOS	D	D	E	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.46	0.93	3.16	1.61	2.37	0.10	4.21	3.94	0.21	4.91	4.62
50th-Percentile Queue Length [ft/ln]	36.57	23.28	78.96	40.19	59.22	2.40	105.14	98.52	5.35	122.67	115.46
95th-Percentile Queue Length [veh/ln]	2.63	1.68	5.68	2.89	4.26	0.17	7.57	7.09	0.38	8.54	8.14
95th-Percentile Queue Length [ft/ln]	65.83	41.91	142.12	72.35	106.60	4.32	189.23	177.33	9.62	213.49	203.57



**Movement, Approach, & Intersection Results**

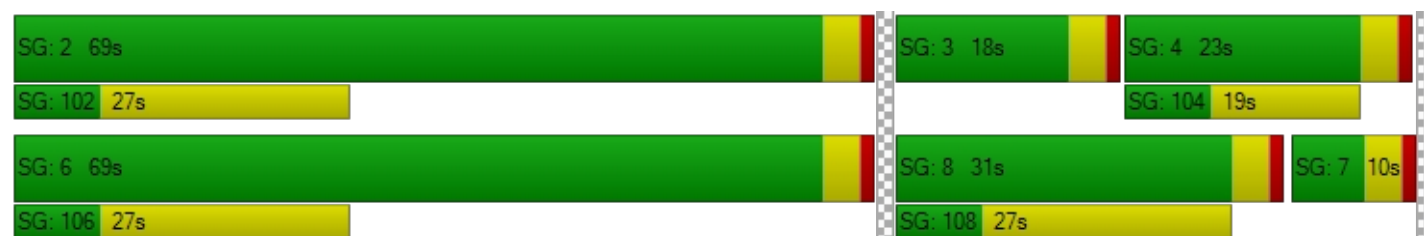
d_M, Delay for Movement [s/veh]	51.89	48.13	56.65	49.74	52.44	52.44	3.03	5.32	5.33	2.73	5.39	5.40
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.84			51.33			5.28			5.30		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.59											
Intersection LOS	B											
Intersection V/C	0.502											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.285			2.050			2.906			2.937		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.880			1.796			2.562			2.771		
Bicycle LOS	A			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	47.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	151	488	229	179	378	301	313	1072	78	387	1070	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	488	229	179	378	301	313	1072	78	387	1070	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	122	57	45	95	75	78	268	20	97	268	36
Total Analysis Volume [veh/h]	151	488	229	179	378	301	313	1072	78	387	1070	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	36	0	14	37	37	16	34	0	26	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	34	34	8	33	49	12	30	30	22	40	40
g / C, Green / Cycle	0.08	0.31	0.31	0.07	0.30	0.45	0.11	0.27	0.27	0.20	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.13	0.05	0.10	0.17	0.09	0.28	0.04	0.22	0.28	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	148	1193	565	243	1144	804	383	1031	488	360	1376	652
d1, Uniform Delay [s]	50.50	29.73	29.69	50.22	29.85	20.22	47.94	40.10	30.54	44.02	31.18	24.33
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.17	0.11	0.11	0.11	0.30	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	39.84	1.04	2.16	4.32	0.77	0.45	4.33	24.95	0.15	58.20	0.98	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.02	0.41	0.41	0.74	0.33	0.37	0.82	1.04	0.16	1.07	0.78	0.22
d, Delay for Lane Group [s/veh]	90.35	30.77	31.84	54.54	30.62	20.67	52.27	65.05	30.69	102.22	32.16	24.50
Lane Group LOS	F	C	C	D	C	C	D	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.69	5.24	5.09	2.56	4.00	5.17	4.41	17.27	1.60	15.53	12.54	2.61
50th-Percentile Queue Length [ft/ln]	142.30	131.00	127.19	63.92	100.10	129.37	110.34	431.87	39.99	388.21	313.57	65.19
95th-Percentile Queue Length [veh/ln]	9.67	8.99	8.79	4.60	7.21	8.91	7.86	24.67	2.88	22.85	18.35	4.69
95th-Percentile Queue Length [ft/ln]	241.86	224.85	219.67	115.06	180.17	222.64	196.47	616.78	71.98	571.19	458.78	117.35

**Movement, Approach, & Intersection Results**

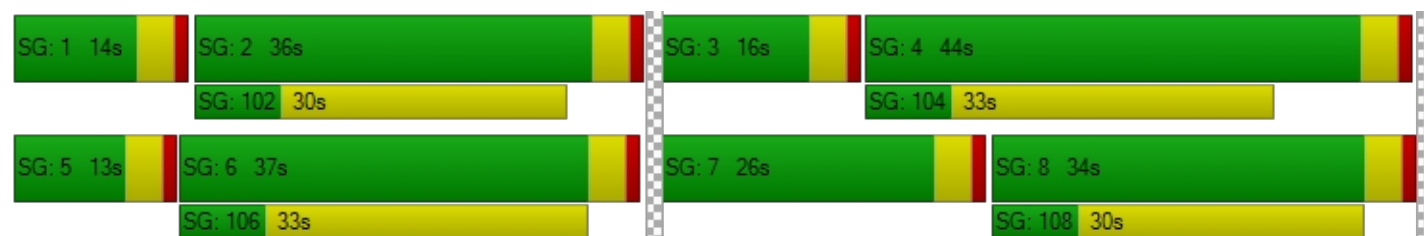
d_M, Delay for Movement [s/veh]	90.35	30.77	31.84	54.54	30.62	20.67	52.27	65.05	30.69	102.22	32.16	24.50
Movement LOS	F	C	C	D	C	C	D	F	C	F	C	C
d_A, Approach Delay [s/veh]	41.41			32.12			60.48			48.42		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	47.91											
Intersection LOS	D											
Intersection V/C	0.851											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.740			2.854			3.019			2.963		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			600			545			727		
d_b, Bicycle Delay [s]	27.65			26.95			29.09			22.27		
I_b,int, Bicycle LOS Score for Intersection	2.276			2.267			2.767			2.880		
Bicycle LOS	B			B			C			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.849

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	28	9	66	0	279	170	105	298	0
Total Analysis Volume [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	34	0	53	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		18	18	52	52	28	84
g / C, Green / Cycle		0.16	0.16	0.47	0.47	0.25	0.76
(v / s)_i Volume / Saturation Flow Rate		0.08	0.15	0.29	0.38	0.23	0.31
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		293	293	1800	853	458	2904
d1, Uniform Delay [s]		41.90	45.12	21.55	24.43	39.89	4.45
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.29	9.67	1.61	7.57	7.83	0.43
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.49	0.90	0.62	0.80	0.92	0.41
d, Delay for Lane Group [s/veh]		43.19	54.78	23.16	32.01	47.72	4.88
Lane Group LOS		D	D	C	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.68	7.78	10.80	16.15	11.90	3.92
50th-Percentile Queue Length [ft/ln]		92.08	194.39	270.04	403.71	297.40	97.93
95th-Percentile Queue Length [veh/ln]		6.63	12.35	16.19	22.74	17.55	7.05
95th-Percentile Queue Length [ft/ln]		165.74	308.72	404.80	568.47	438.81	176.28



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	43.19	43.19	54.78	0.00	23.16	32.01	47.72	4.88	0.00
Movement LOS				D	D	D		C	C	D	A	
d_A, Approach Delay [s/veh]	0.00			50.66			26.50			16.05		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	24.67											
Intersection LOS	C											
Intersection V/C	0.849											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.537	1.923	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	545	1509
d_b, Bicycle Delay [s]	55.00	37.64	29.09	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.233	2.545	2.889
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	0	118	0	0	0	104	215	0	0	254	41
Total Analysis Volume [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	47	0	0	0	0	0	44	63	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26		28	76	44	44
g / C, Green / Cycle	0.24	0.24	0.24		0.25	0.69	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.20	0.20	0.20		0.23	0.23	0.31	0.33
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	429	429	429		455	2619	760	720
d1, Uniform Delay [s]	40.01	40.01	40.01		39.95	6.86	28.69	29.43
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.78	4.78	4.78		7.76	0.33	7.59	10.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.92	0.33	0.78	0.82
d, Delay for Lane Group [s/veh]	44.78	44.78	44.78		47.71	7.20	36.29	39.45
Lane Group LOS	D	D	D		D	A	D	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.87	9.87	9.87		11.80	3.79	14.79	15.53
50th-Percentile Queue Length [ft/ln]	246.80	246.80	246.80		295.07	94.68	369.86	388.33
95th-Percentile Queue Length [veh/ln]	15.02	15.02	15.02		17.44	6.82	21.10	22.00
95th-Percentile Queue Length [ft/ln]	375.62	375.62	375.62		435.93	170.43	527.56	549.92

**Movement, Approach, & Intersection Results**

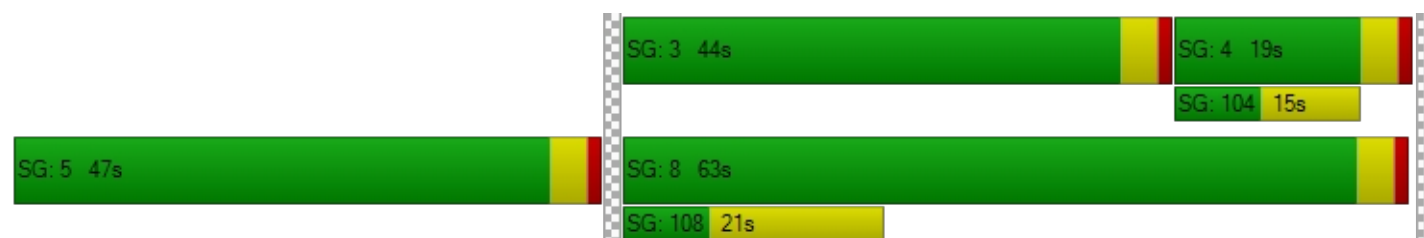
d_M, Delay for Movement [s/veh]	44.78	0.00	44.78	0.00	0.00	0.00	47.71	7.20	0.00	0.00	37.62	39.45
Movement LOS	D		D				D	A			D	D
d_A, Approach Delay [s/veh]	44.78			0.00			20.45			37.87		
Approach LOS	D			A			C			D		
d_I, Intersection Delay [s/veh]	33.73											
Intersection LOS	C											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.305	1.998	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1073	273
d_b, Bicycle Delay [s]	55.00	55.00	11.82	41.02
I_b,int, Bicycle LOS Score for Intersection	5.934	4.132	2.611	2.531
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	4.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.298

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	27	627	18	23	883	13	14	14	33	12	15	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	627	18	23	883	13	14	14	33	12	15	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	157	5	6	221	3	4	4	8	3	4	5
Total Analysis Volume [veh/h]	27	627	18	23	883	13	14	14	33	12	15	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.17	0.01	0.24	0.24	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1539	1673	1585	1563	1673	1585	124	125
d1, Uniform Delay [s]	0.79	0.95	0.95	0.79	1.03	1.03	51.72	51.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.27	0.28	0.02	0.41	0.43	3.00	1.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.20	0.20	0.01	0.28	0.27	0.49	0.37
d, Delay for Lane Group [s/veh]	0.81	1.21	1.22	0.81	1.44	1.46	54.73	53.08
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.43	0.41	0.02	0.65	0.62	1.76	1.30
50th-Percentile Queue Length [ft/ln]	0.74	10.67	10.16	0.62	16.19	15.48	44.02	32.54
95th-Percentile Queue Length [veh/ln]	0.05	0.77	0.73	0.04	1.17	1.11	3.17	2.34
95th-Percentile Queue Length [ft/ln]	1.33	19.21	18.29	1.12	29.15	27.87	79.23	58.57



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.81	1.22	1.22	0.81	1.45	1.46	54.73	54.73	54.73	53.08	53.08	53.08
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.20			1.43			54.73			53.08		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.66											
Intersection LOS	A											
Intersection V/C	0.298											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.638			2.637			1.819			1.806		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.114			2.318			1.660			1.636		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.889

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	148	1295	133	134	1475	203	210	530	143	160	674	214
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	1295	133	134	1475	203	210	530	143	160	674	214
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	324	33	34	369	51	53	133	36	40	169	54
Total Analysis Volume [veh/h]	148	1295	133	134	1475	203	210	530	143	160	674	214
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	52	0	15	57	0	11	33	0	10	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	62	52	52	62	52	52	40	29	29	40	28	28
g / C, Green / Cycle	0.56	0.47	0.47	0.56	0.47	0.47	0.36	0.26	0.26	0.36	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.08	0.34	0.07	0.07	0.46	0.45	0.12	0.14	0.08	0.09	0.18	0.12
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	318	1802	854	621	900	852	458	999	473	535	963	456
d1, Uniform Delay [s]	11.37	23.06	16.41	11.28	28.03	27.77	25.27	34.73	32.47	24.50	37.25	34.78
k, delay calibration	0.11	0.11	0.11	0.11	0.43	0.42	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	0.55	0.08	0.17	20.28	18.96	0.72	2.02	1.64	1.43	4.22	3.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.72	0.16	0.22	0.96	0.95	0.46	0.53	0.30	0.30	0.70	0.47
d, Delay for Lane Group [s/veh]	12.43	23.61	16.50	11.45	48.31	46.73	25.99	36.75	34.11	25.94	41.47	38.21
Lane Group LOS	B	C	B	B	D	D	C	D	C	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.78	13.08	1.91	1.54	26.10	24.00	4.03	6.32	3.26	3.12	8.72	5.27
50th-Percentile Queue Length [ft/ln]	44.38	327.02	47.81	38.48	652.39	600.10	100.84	158.12	81.62	78.12	218.01	131.77
95th-Percentile Queue Length [veh/ln]	3.20	19.01	3.44	2.77	34.47	32.04	7.26	10.45	5.88	5.62	13.56	9.04
95th-Percentile Queue Length [ft/ln]	79.88	475.31	86.06	69.26	861.84	800.97	181.51	261.23	146.91	140.62	339.09	225.89

**Movement, Approach, & Intersection Results**

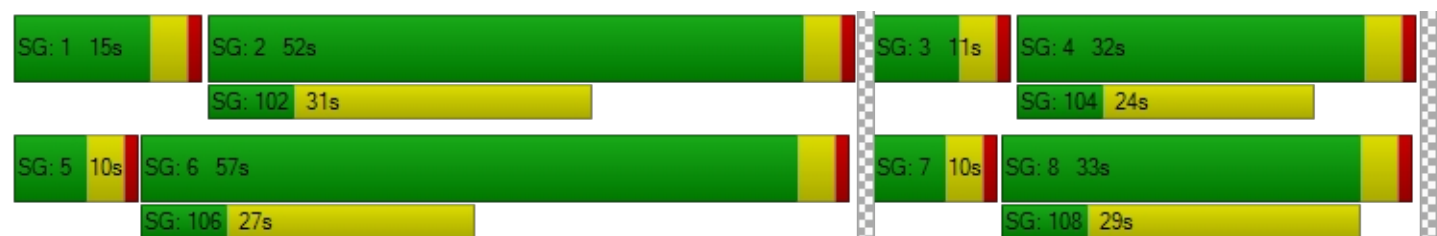
d_M, Delay for Movement [s/veh]	12.43	23.61	16.50	11.45	47.65	46.73	25.99	36.75	34.11	25.94	41.47	38.21
Movement LOS	B	C	B	B	D	D	C	D	C	C	D	D
d_A, Approach Delay [s/veh]	21.96			44.87			33.76			38.43		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	34.97											
Intersection LOS	C											
Intersection V/C	0.889											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.071			3.079			2.876			2.856		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			964			527			509		
d_b, Bicycle Delay [s]	17.47			14.77			29.82			30.56		
I_b,int, Bicycle LOS Score for Intersection	2.860			3.055			2.288			2.424		
Bicycle LOS	C			C			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	126	534	246	32	760	77	98	656	116	343	832	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	126	534	246	32	760	77	98	656	116	343	832	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	134	62	8	190	19	25	164	29	86	208	7
Total Analysis Volume [veh/h]	126	534	246	32	760	77	98	656	116	343	832	29
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	53	0	11	54	0	16	31	0	15	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	31	31	39	28	28	8	46	46	13	52	52
g / C, Green / Cycle	0.35	0.28	0.28	0.35	0.26	0.26	0.07	0.42	0.42	0.12	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.07	0.14	0.14	0.02	0.23	0.22	0.05	0.17	0.06	0.10	0.22	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	333	1062	503	518	492	467	127	1588	752	428	1784	845
d1, Uniform Delay [s]	24.94	33.25	33.10	23.62	39.23	38.85	50.29	22.55	19.95	47.01	19.83	15.74
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.71	0.37	0.74	0.05	5.57	4.69	9.47	0.80	0.44	3.52	0.88	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.50	0.49	0.06	0.89	0.86	0.77	0.41	0.15	0.80	0.47	0.03
d, Delay for Lane Group [s/veh]	25.65	33.62	33.84	23.67	44.80	43.54	59.76	23.35	20.38	50.53	20.71	15.82
Lane Group LOS	C	C	C	C	D	D	E	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.37	6.00	5.56	0.56	11.97	10.78	2.98	6.08	1.94	4.76	7.30	0.41
50th-Percentile Queue Length [ft/ln]	59.15	150.06	138.96	14.01	299.31	269.61	74.53	151.95	48.43	119.09	182.55	10.25
95th-Percentile Queue Length [veh/ln]	4.26	10.02	9.43	1.01	17.65	16.17	5.37	10.12	3.49	8.34	11.73	0.74
95th-Percentile Queue Length [ft/ln]	106.46	250.51	235.63	25.21	441.18	404.25	134.15	253.03	87.17	208.57	293.34	18.44



**Movement, Approach, & Intersection Results**

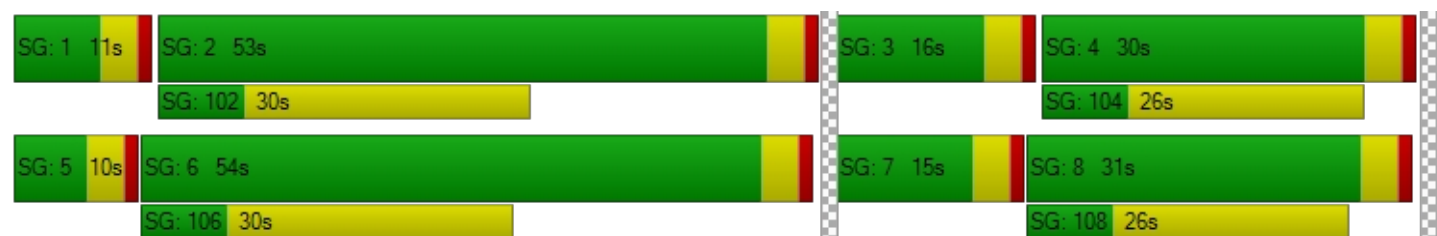
d_M, Delay for Movement [s/veh]	25.65	33.62	33.84	23.67	44.26	43.54	59.76	23.35	20.38	50.53	20.71	15.82
Movement LOS	C	C	C	C	D	D	E	C	C	D	C	B
d_A, Approach Delay [s/veh]	32.57			43.44			27.06			29.09		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	32.69											
Intersection LOS	C											
Intersection V/C	0.648											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.808			2.608			2.822			2.915		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			909			491			473		
d_b, Bicycle Delay [s]	16.91			16.36			31.31			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.307			2.277			2.277			2.553		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	92	1533	46	143	1693	67	83	140	161	143	154	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	1533	46	143	1693	67	83	140	161	143	154	99
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	383	12	36	423	17	21	35	40	36	39	25
Total Analysis Volume [veh/h]	92	1533	46	143	1693	67	83	140	161	143	154	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	52	0	0	52	0	0	58	0	0	58	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	26	26	26
g / C, Green / Cycle	0.69	0.69	0.69	0.69	0.69	0.69	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.43	0.43	0.08	0.48	0.48	0.21	0.08	0.14
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	782	1319	1249	868	1319	1249	459	79	420
d1, Uniform Delay [s]	5.42	8.98	8.95	5.58	9.81	9.80	41.06	33.78	37.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	2.17	2.26	0.41	2.92	3.07	4.08	373.62	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.62	0.61	0.16	0.69	0.68	0.84	1.81	0.60
d, Delay for Lane Group [s/veh]	5.72	11.15	11.21	5.99	12.73	12.87	45.14	407.40	38.98
Lane Group LOS	A	B	B	A	B	B	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.69	9.99	9.41	1.10	12.23	11.62	10.54	9.91	6.20
50th-Percentile Queue Length [ft/ln]	17.35	249.64	235.34	27.59	305.86	290.44	263.39	247.85	155.06
95th-Percentile Queue Length [veh/ln]	1.25	15.17	14.45	1.99	17.97	17.21	15.86	17.85	10.29
95th-Percentile Queue Length [ft/ln]	31.23	379.20	361.13	49.66	449.27	430.19	396.47	446.13	257.16

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.72	11.18	11.21	5.99	12.79	12.87	45.14	45.14	45.14	407.40	38.98	38.98
Movement LOS	A	B	B	A	B	B	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	10.88			12.28			45.14			172.02		
Approach LOS	B			B			D			F		
d_I, Intersection Delay [s/veh]	29.17											
Intersection LOS	C											
Intersection V/C	0.743											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.228			3.133			2.195			2.389		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			873			982			982		
d_b, Bicycle Delay [s]	17.47			17.47			14.25			14.25		
I_b,int, Bicycle LOS Score for Intersection	2.938			3.130			2.193			2.213		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	177	980	78	62	1045	156	79	47	166	110	41	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	177	980	78	62	1045	156	79	47	166	110	41	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	245	20	16	261	39	20	12	42	28	10	12
Total Analysis Volume [veh/h]	177	980	78	62	1045	156	79	47	166	110	41	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	39	0	0	39	0	0	71	0	0	71	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	82	82	82	82	82	82	20	20
g / C, Green / Cycle	0.75	0.75	0.75	0.75	0.75	0.75	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.10	0.29	0.28	0.03	0.33	0.32	0.16	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1139	1416	1342	1179	1416	1342	369	378
d1, Uniform Delay [s]	3.95	5.01	4.96	3.69	5.33	5.22	43.88	41.36
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	0.80	0.82	0.08	1.01	0.99	3.85	1.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.16	0.39	0.38	0.05	0.44	0.43	0.79	0.53
d, Delay for Lane Group [s/veh]	4.24	5.82	5.78	3.77	6.34	6.21	47.73	42.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.05	4.11	3.77	0.34	5.01	4.47	8.09	5.09
50th-Percentile Queue Length [ft/ln]	26.35	102.72	94.36	8.56	125.35	111.81	202.29	127.25
95th-Percentile Queue Length [veh/ln]	1.90	7.40	6.79	0.62	8.69	7.94	12.76	8.79
95th-Percentile Queue Length [ft/ln]	47.43	184.90	169.84	15.41	217.16	198.52	318.92	219.75



**Movement, Approach, & Intersection Results**

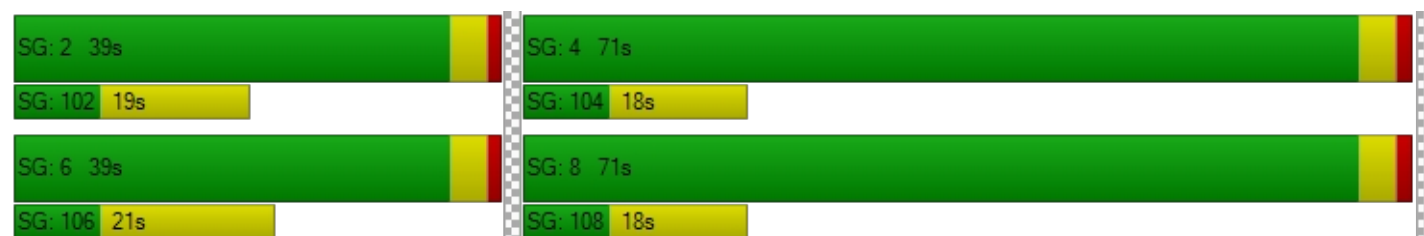
d_M, Delay for Movement [s/veh]	4.24	5.80	5.78	3.77	6.29	6.21	47.73	47.73	47.73	42.51	42.51	42.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.57			6.15			47.73			42.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.41											
Intersection LOS	B											
Intersection V/C	0.532											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.964			2.884			2.301			2.001		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			636			1218			1218		
d_b, Bicycle Delay [s]	25.57			25.57			8.40			8.40		
I_b,int, Bicycle LOS Score for Intersection	2.578			2.602			2.041			1.890		
Bicycle LOS	B			B			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	81.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.983

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	282	1635	234	227	1586	175	277	853	293	280	1087	258
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	282	1635	234	227	1586	175	277	853	293	280	1087	258
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	409	59	57	397	44	69	213	73	70	272	65
Total Analysis Volume [veh/h]	282	1635	234	227	1586	175	277	853	293	280	1087	258
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	43	0	10	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	39	39	6	37	37	16	35	35	14	33	33
g / C, Green / Cycle	0.07	0.35	0.35	0.05	0.34	0.34	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.08	0.43	0.13	0.06	0.38	0.18	0.15	0.15	0.16	0.16	0.19	0.14
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1346	637	191	1277	605	266	1803	570	233	1700	537
d1, Uniform Delay [s]	51.00	35.52	26.37	52.00	36.52	29.68	46.89	30.23	30.70	47.88	33.46	31.61
k, delay calibration	0.11	0.17	0.11	0.11	0.13	0.12	0.13	0.50	0.50	0.14	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	60.89	99.21	0.35	96.15	57.89	0.86	40.20	0.89	3.30	101.92	1.85	3.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.11	1.21	0.37	1.19	1.12	0.54	1.04	0.47	0.51	1.20	0.64	0.48
d, Delay for Lane Group [s/veh]	111.89	134.73	26.72	148.15	94.41	30.54	87.09	31.12	34.00	149.81	35.31	34.67
Lane Group LOS	F	F	C	F	F	C	F	C	C	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.65	36.09	4.59	5.18	26.99	7.16	10.19	6.16	6.81	12.95	8.59	6.04
50th-Percentile Queue Length [ft/ln]	141.18	902.30	114.83	129.44	674.79	178.94	254.67	154.04	170.37	323.76	214.77	150.97
95th-Percentile Queue Length [veh/ln]	9.86	51.99	8.11	9.32	38.26	11.55	15.72	10.23	11.10	20.33	13.40	10.07
95th-Percentile Queue Length [ft/ln]	246.39	1299.87	202.70	232.98	956.39	288.63	393.11	255.81	277.41	508.22	334.94	251.72

**Movement, Approach, & Intersection Results**

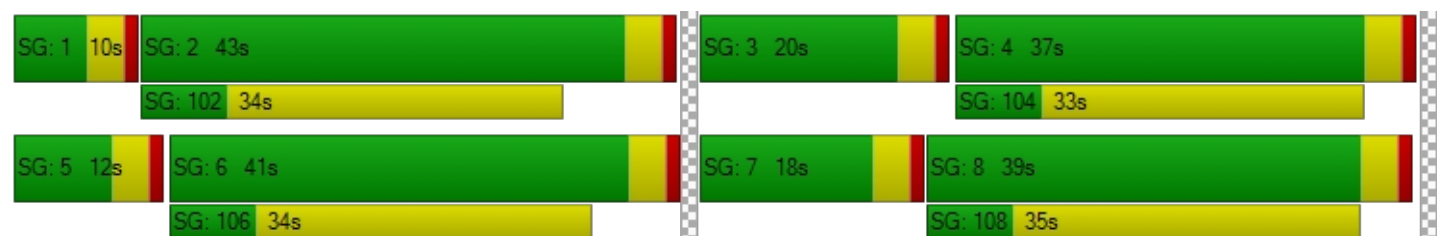
d_M, Delay for Movement [s/veh]	111.89	134.73	26.72	148.15	88.20	30.54	87.09	31.12	34.00	149.81	35.31	34.67
Movement LOS	F	F	C	F	F	C	F	C	C	F	D	C
d_A, Approach Delay [s/veh]	119.98			89.97			42.61			54.94		
Approach LOS	F			F			D			D		
d_I, Intersection Delay [s/veh]	81.65											
Intersection LOS	F											
Intersection V/C	0.983											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.260			3.183			3.097			3.093		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			673			636			600		
d_b, Bicycle Delay [s]	22.91			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.334			2.653			2.342			2.453		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.902

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	361	1017	106	190	1065	179	200	731	305	279	720	158
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	361	1017	106	190	1065	179	200	731	305	279	720	158
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	254	27	48	266	45	50	183	76	70	180	40
Total Analysis Volume [veh/h]	361	1017	106	190	1065	179	200	731	305	279	720	158
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	21	50	0	12	41	0	14	37	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	54	42	42	54	34	34	14	33	33	11	30	30
g / C, Green / Cycle	0.49	0.38	0.38	0.49	0.31	0.31	0.12	0.30	0.30	0.10	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.20	0.27	0.06	0.11	0.28	0.10	0.11	0.19	0.17	0.08	0.24	0.23
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	496	1461	692	572	1180	559	222	1143	542	336	519	492
d1, Uniform Delay [s]	17.61	28.48	22.16	15.74	36.37	29.07	47.59	33.32	32.40	48.90	38.48	37.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.06	0.61	0.10	0.34	2.88	0.33	12.40	2.74	4.20	5.33	20.53	15.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	0.70	0.15	0.33	0.90	0.32	0.90	0.64	0.56	0.83	0.89	0.84
d, Delay for Lane Group [s/veh]	19.67	29.09	22.26	16.08	39.25	29.40	59.99	36.06	36.59	54.23	59.01	53.49
Lane Group LOS	B	C	C	B	D	C	E	D	D	D	E	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.97	11.18	1.81	2.73	13.92	3.66	6.15	8.80	7.42	4.00	14.85	12.52
50th-Percentile Queue Length [ft/ln]	149.13	279.53	45.33	68.15	348.09	91.62	153.64	220.09	185.53	100.00	371.26	313.08
95th-Percentile Queue Length [veh/ln]	9.97	16.67	3.26	4.91	20.04	6.60	10.21	13.67	11.89	7.20	21.17	18.33
95th-Percentile Queue Length [ft/ln]	249.26	416.63	81.60	122.67	501.07	164.92	255.27	341.74	297.22	180.01	529.26	458.17



**Movement, Approach, & Intersection Results**

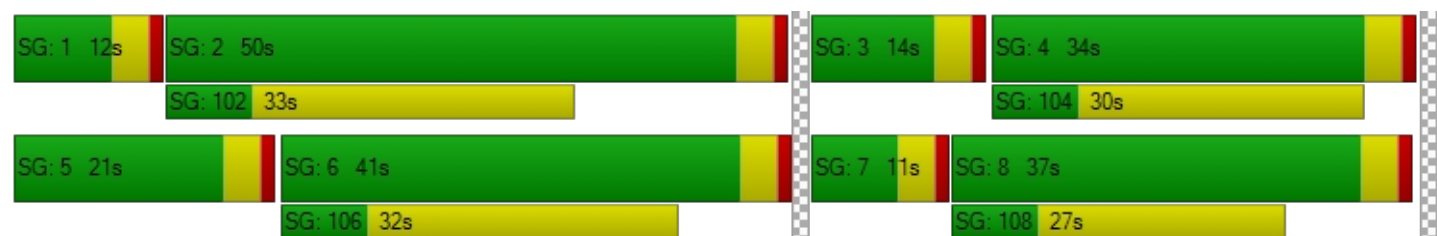
d_M, Delay for Movement [s/veh]	19.67	29.09	22.26	16.08	39.25	29.40	59.99	36.06	36.59	54.23	57.05	53.49
Movement LOS	B	C	C	B	D	C	E	D	D	D	E	D
d_A, Approach Delay [s/veh]	26.31			34.95			40.07			55.88		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.29											
Intersection LOS	D											
Intersection V/C	0.902											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.972			2.919			3.037			3.017		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	836			673			600			545		
d_b, Bicycle Delay [s]	18.62			24.22			26.95			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.784			2.743			2.239			2.514		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.995

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	522	0	0	445	224	0	0	0	60	108	155
Total Analysis Volume [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	62	0	0	52	0	0	0	0	0	38	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	58	48	48		34	34	34
g / C, Green / Cycle	0.06	0.58	0.48	0.48		0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.47	0.50		0.13	0.11	0.34
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3307	1829	866		612	1291	612
d1, Uniform Delay [s]	45.88	13.90	25.31	25.94		25.11	24.58	33.01
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.65	0.92	15.59	39.05		0.40	0.15	38.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.63	0.97	1.03		0.39	0.33	1.01
d, Delay for Lane Group [s/veh]	48.53	14.82	40.89	64.98		25.52	24.73	71.58
Lane Group LOS	D	B	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.53	9.91	23.24	28.63		4.31	3.78	20.87
50th-Percentile Queue Length [ft/ln]	38.36	247.81	580.89	715.73		107.67	94.58	521.77
95th-Percentile Queue Length [veh/ln]	2.76	15.08	31.14	38.34		7.71	6.81	28.63
95th-Percentile Queue Length [ft/ln]	69.04	376.89	778.52	958.57		192.75	170.24	715.71

**Movement, Approach, & Intersection Results**

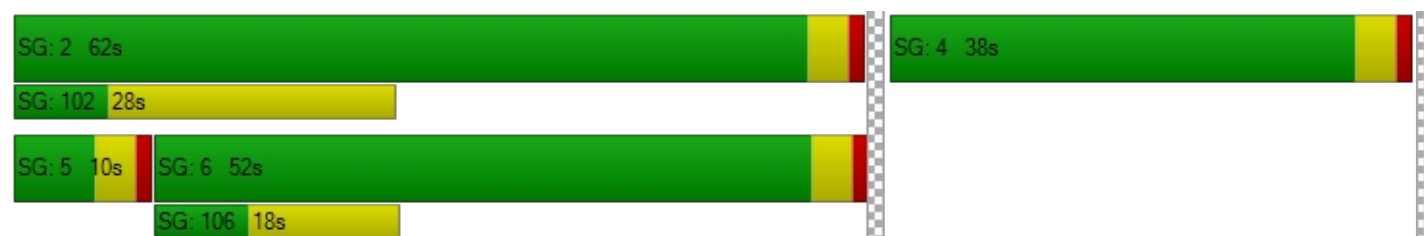
d_M, Delay for Movement [s/veh]	48.53	14.82	0.00	0.00	40.89	64.98	0.00	0.00	0.00	25.52	24.73	71.58
Movement LOS	D	B			D	F				C	C	F
d_A, Approach Delay [s/veh]	16.67			48.95			0.00			47.41		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	37.08											
Intersection LOS	D											
Intersection V/C	0.995											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.425			2.450		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1160			960			0			680		
d_b, Bicycle Delay [s]	8.82			13.52			50.00			21.78		
I_b,int, Bicycle LOS Score for Intersection	2.773			3.030			4.132			2.623		
Bicycle LOS	C			C			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	36.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.947

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	224	0	0	321	87	0	0	0	46	173	216
Total Analysis Volume [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	44	0	0	34	0	0	0	0	0	56	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	42	32	32		50	50	50
g / C, Green / Cycle	0.06	0.42	0.32	0.32		0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.05	0.16	0.29	0.30		0.25	0.23	0.48
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	111	2380	1200	568		904	955	904
d1, Uniform Delay [s]	46.36	20.12	32.81	33.56		16.45	16.02	23.83
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.41
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	13.44	0.45	11.47	28.56		0.42	0.34	18.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.38	0.91	0.96		0.49	0.45	0.96
d, Delay for Lane Group [s/veh]	59.79	20.57	44.28	62.11		16.87	16.35	42.40
Lane Group LOS	E	C	D	E		B	B	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.64	4.80	14.19	17.07		6.58	6.19	22.86
50th-Percentile Queue Length [ft/ln]	65.99	120.07	354.78	426.68		164.41	154.69	571.55
95th-Percentile Queue Length [veh/ln]	4.75	8.40	20.37	23.84		10.78	10.27	30.70
95th-Percentile Queue Length [ft/ln]	118.77	209.93	509.23	596.06		269.56	256.67	767.59



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.79	20.57	0.00	0.00	47.02	62.11	0.00	0.00	0.00	16.87	16.55	42.40
Movement LOS	E	C			D	E				B	B	D
d_A, Approach Delay [s/veh]	24.20			50.23			0.00			29.42		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	36.03											
Intersection LOS	D											
Intersection V/C	0.947											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.271	2.511
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	600	0	1040
d_b, Bicycle Delay [s]	18.00	24.50	50.00	11.52
I_b,int, Bicycle LOS Score for Intersection	2.101	2.457	4.132	2.997
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.759

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	317	71	161	337	0	229	70	40	0	0	0
Total Analysis Volume [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	31	60	0	0	40	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	21	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.21	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.18	0.24	0.26	0.15	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2107	665	737	3536	1049	569	539	
d1, Uniform Delay [s]	25.55	23.59	38.17	9.44	33.23	28.78	26.91	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.28	2.00	3.40	0.31	2.47	0.66	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.43	0.87	0.38	0.87	0.49	0.30	
d, Delay for Lane Group [s/veh]	26.83	25.59	41.57	9.76	35.70	29.44	27.22	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.20	5.30	7.85	4.61	10.65	5.57	2.96	
50th-Percentile Queue Length [ft/ln]	204.98	132.51	196.23	115.31	266.35	139.23	73.88	
95th-Percentile Queue Length [veh/ln]	12.90	9.08	12.44	8.13	16.01	9.44	5.32	
95th-Percentile Queue Length [ft/ln]	322.39	226.91	311.10	203.36	400.17	235.98	132.99	

**Movement, Approach, & Intersection Results**

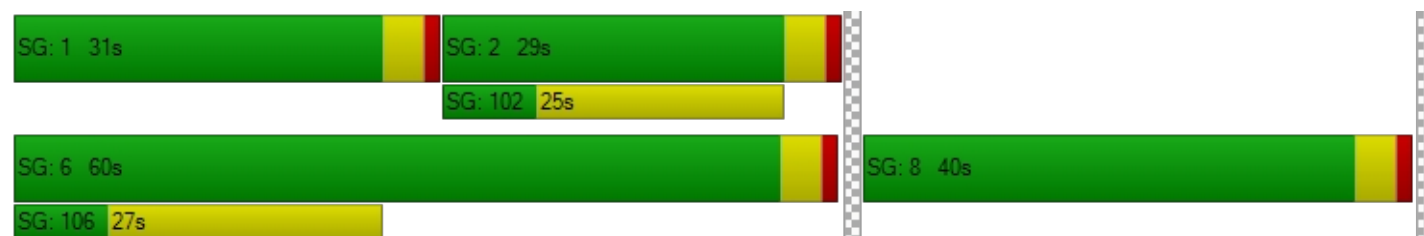
d_M, Delay for Movement [s/veh]	0.00	26.83	25.59	41.57	9.76	0.00	35.70	29.44	27.22	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	26.61			20.03			33.40			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	25.82											
Intersection LOS	C											
Intersection V/C	0.759											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.467			2.309		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1120			720			0		
d_b, Bicycle Delay [s]	28.13			9.68			20.48			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.413			2.655			3.800			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	183	49	180	203	0	62	231	16	0	0	0
Total Analysis Volume [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	29	52	0	0	48	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	29	29	23	56	36	36	36	
g / C, Green / Cycle	0.29	0.29	0.23	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.17	0.21	0.21	0.33	0.30	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1110	526	797	2127	648	684	648	
d1, Uniform Delay [s]	29.92	30.25	37.53	12.33	30.47	29.43	21.21	
k, delay calibration	0.50	0.50	0.11	0.50	0.28	0.24	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.01	4.74	4.10	0.52	12.11	6.23	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.56	0.59	0.90	0.38	0.91	0.85	0.10	
d, Delay for Lane Group [s/veh]	31.93	34.99	41.62	12.85	42.59	35.66	21.27	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.49	6.94	8.85	4.99	15.29	13.58	0.98	
50th-Percentile Queue Length [ft/ln]	162.16	173.40	221.37	124.67	382.14	339.47	24.59	
95th-Percentile Queue Length [veh/ln]	10.66	11.26	13.74	8.65	21.70	19.62	1.77	
95th-Percentile Queue Length [ft/ln]	266.59	281.38	343.38	216.23	542.44	490.55	44.26	



**Movement, Approach, & Intersection Results**

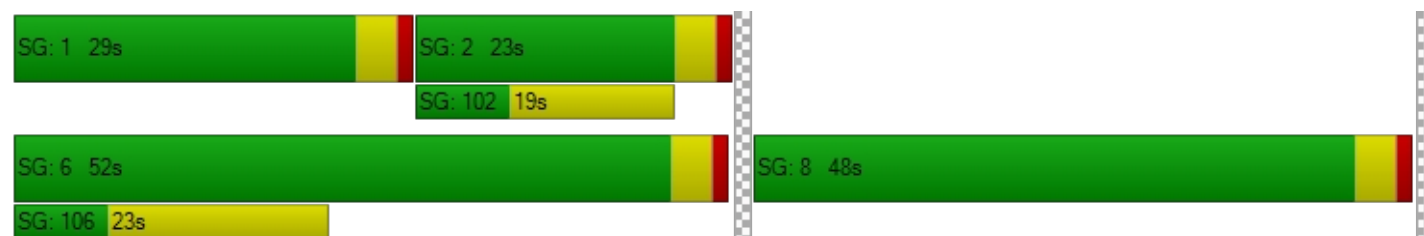
d_M, Delay for Movement [s/veh]	0.00	32.41	34.99	41.62	12.85	0.00	42.59	38.24	21.27	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	32.95			26.35			38.25			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	31.98											
Intersection LOS	C											
Intersection V/C	0.801											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.346			2.614		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			960			880			0		
d_b, Bicycle Delay [s]	32.81			13.52			15.68			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.068			2.824			2.577			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	23	282	21	10	322
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	23	282	21	10	322
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	6	71	5	3	81
Total Analysis Volume [veh/h]	0	23	282	21	10	322
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	9.91	0.00	0.00	7.88	0.00
Movement LOS		A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.09	0.00	0.00	0.02	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.35	0.00	0.00	0.60	0.00
d_A, Approach Delay [s/veh]	9.91		0.00		0.24	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.47					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	5.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.201

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	491	30	5	399	0	2	2	7	61	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	491	30	5	399	0	2	2	7	61	0	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	123	8	1	100	0	1	1	2	15	0	3
Total Analysis Volume [veh/h]	0	491	30	5	399	0	2	2	7	61	0	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	73	0	10	83	0	0	27	0	27	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	92	92	97	97	5	5	5	5
g / C, Green / Cycle	0.83	0.83	0.88	0.88	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.00	0.11	0.00	0.01	0.03	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1584	1500	1618	3337	124	121	116	88
d1, Uniform Delay [s]	1.77	1.78	0.82	0.91	49.78	49.97	51.47	50.06
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	0.25	0.00	0.07	0.05	0.26	3.70	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.16	0.17	0.00	0.12	0.02	0.07	0.53	0.14
d, Delay for Lane Group [s/veh]	1.99	2.03	0.82	0.99	49.83	50.23	55.17	50.75
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.76	0.77	0.00	0.22	0.05	0.25	1.77	0.33
50th-Percentile Queue Length [ft/ln]	18.97	19.28	0.11	5.49	1.35	6.14	44.29	8.33
95th-Percentile Queue Length [veh/ln]	1.37	1.39	0.01	0.39	0.10	0.44	3.19	0.60
95th-Percentile Queue Length [ft/ln]	34.14	34.70	0.20	9.87	2.44	11.04	79.72	14.99

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	2.01	2.03	0.82	0.99	0.00	49.83	50.23	50.23	55.17	0.00	50.75
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	2.01			0.98			50.16			54.44		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.92											
Intersection LOS	A											
Intersection V/C	0.201											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.490			1.730			1.992		
Crosswalk LOS	F			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1255			1436			418			0		
d_b, Bicycle Delay [s]	7.64			4.37			34.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.989			1.893			1.578			4.132		
Bicycle LOS	A			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.083

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	63	203	267	0	50	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	203	267	0	50	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	51	67	0	13	5
Total Analysis Volume [veh/h]	63	203	267	0	50	18
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.08	0.02
d_M, Delay for Movement [s/veh]	7.92	0.00	0.00	0.00	11.66	10.34
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	0.36	0.36
95th-Percentile Queue Length [ft/ln]	3.83	0.00	0.00	0.00	8.90	8.90
d_A, Approach Delay [s/veh]	1.88		0.00		11.31	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.11					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	260	249	0	0	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	260	249	0	0	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	65	62	0	0	22
Total Analysis Volume [veh/h]	0	260	249	0	0	87
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	10.98	10.12
Movement LOS		A	A		B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.37	0.37
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	9.25	9.25
d_A, Approach Delay [s/veh]	0.00		0.00		10.12	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.48					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.020

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	245	13	25	317	12	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	245	13	25	317	12	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	3	6	79	3	6
Total Analysis Volume [veh/h]	245	13	25	317	12	22
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.00	0.02	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.81	0.00	11.25	9.83
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.15	0.15
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.46	0.00	3.77	3.77
d_A, Approach Delay [s/veh]	0.00		0.57		10.33	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.86					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	442	53	0	405	5	0	0	13	0	0	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	442	53	0	405	5	0	0	13	0	0	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	111	13	0	101	1	0	0	3	0	0	6
Total Analysis Volume [veh/h]	6	442	53	0	405	5	0	0	13	0	0	24
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	8.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.57	0.00	0.00	9.94
Movement LOS	A	A	A		A	A			A			A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.10
95th-Percentile Queue Length [ft/ln]	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	2.47
d_A, Approach Delay [s/veh]	0.10			0.00			9.57			9.94		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	0.43											
Intersection LOS	A											

*APPENDIX G-IV*





**YEAR 2030 BUILDOUT PLUS PROJECT  
WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	89.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.059

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	354	1768	267	387	1566	467	362	1491	271	266	1317	366
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	354	1768	267	387	1566	467	362	1491	271	266	1317	366
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	442	67	97	392	117	91	373	68	67	329	92
Total Analysis Volume [veh/h]	354	1768	267	387	1566	467	362	1491	271	266	1317	366
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	10	39	0	16	48	0	10	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	42	42	6	39	39	12	40	40	6	34	34
g / C, Green / Cycle	0.08	0.38	0.38	0.06	0.36	0.36	0.11	0.36	0.36	0.06	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.10	0.31	0.15	0.11	0.36	0.37	0.20	0.31	0.32	0.08	0.23	0.20
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	291	2184	690	197	1353	641	198	1366	647	197	1741	550
d1, Uniform Delay [s]	50.52	30.40	24.62	52.01	35.48	35.48	49.03	32.80	33.41	52.01	34.57	33.37
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.26	0.11	0.33	0.11	0.11	0.16
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	104.34	3.37	1.64	440.19	26.35	47.68	381.61	1.76	12.74	166.37	0.69	2.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.22	0.81	0.39	1.97	1.01	1.04	1.83	0.86	0.90	1.35	0.76	0.67
d, Delay for Lane Group [s/veh]	154.86	33.77	26.26	492.20	61.83	83.16	430.64	34.55	46.16	218.38	35.26	35.41
Lane Group LOS	F	C	C	F	F	F	F	C	D	F	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.21	14.33	5.32	14.72	22.61	25.21	26.45	14.60	16.63	7.25	10.58	8.73
50th-Percentile Queue Length [ft/ln]	205.35	358.18	133.03	368.04	565.18	630.34	661.15	365.08	415.68	181.20	264.45	218.35
95th-Percentile Queue Length [veh/ln]	13.77	20.53	9.10	24.29	30.57	34.48	41.84	20.87	23.31	12.62	15.91	13.58
95th-Percentile Queue Length [ft/ln]	344.24	513.37	227.61	607.26	764.27	861.98	1046.04	521.76	582.86	315.47	397.80	339.52

**Movement, Approach, & Intersection Results**

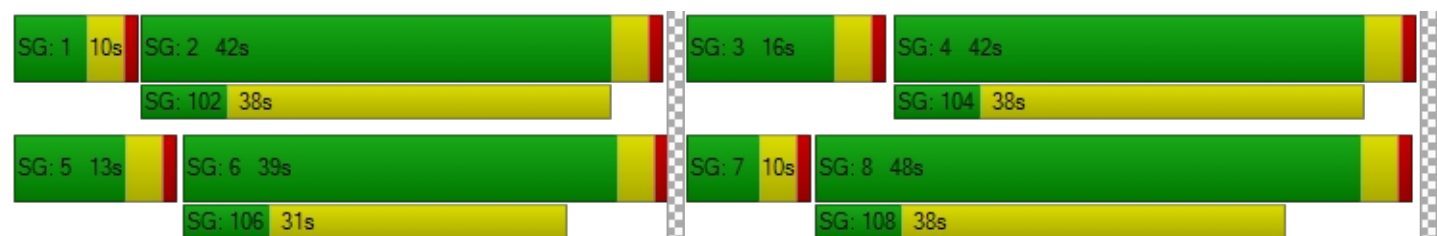
d_M, Delay for Movement [s/veh]	154.86	33.77	26.26	492.20	64.59	83.16	430.64	36.97	46.16	218.38	35.26	35.41
Movement LOS	F	C	C	F	E	F	F	D	D	F	D	D
d_A, Approach Delay [s/veh]	50.88			136.56			105.24			60.28		
Approach LOS	D			F			F			E		
d_I, Intersection Delay [s/veh]	89.28											
Intersection LOS	F											
Intersection V/C	1.059											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.345			3.334			3.197			3.302		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			800			691		
d_b, Bicycle Delay [s]	23.56			25.57			19.80			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.874			2.891			2.728			2.632		
Bicycle LOS	C			C			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	37.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.898

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	12	1930	718	108	2016	59	96	194	15	671	117	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	1930	718	108	2016	59	96	194	15	671	117	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	483	180	27	504	15	24	49	4	168	29	0
Total Analysis Volume [veh/h]	12	1930	718	108	2016	59	96	194	15	671	117	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	51	0	12	53	0	0	13	0	0	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	47	8	53	53	12	12	12	27	27
g / C, Green / Cycle	0.02	0.43	0.07	0.48	0.48	0.11	0.11	0.11	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.34	0.06	0.44	0.23	0.05	0.10	0.01	0.22	0.22
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	31	2443	132	1841	872	200	211	200	435	435
d1, Uniform Delay [s]	53.50	27.16	50.29	26.07	18.90	45.91	48.41	43.83	40.46	40.56
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.30	0.31
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.64	2.70	11.82	7.94	1.79	1.78	14.70	0.16	16.72	17.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.79	0.82	0.91	0.47	0.48	0.92	0.07	0.90	0.91
d, Delay for Lane Group [s/veh]	61.13	29.86	62.12	34.02	20.70	47.69	63.11	43.99	57.18	58.44
Lane Group LOS	E	C	E	C	C	D	E	D	E	E
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.39	14.80	3.36	21.18	7.21	2.56	6.10	0.38	12.20	12.46
50th-Percentile Queue Length [ft/ln]	9.85	370.11	83.90	529.58	180.33	63.96	152.60	9.39	305.00	311.41
95th-Percentile Queue Length [veh/ln]	0.71	21.11	6.04	28.73	11.62	4.61	10.16	0.68	17.93	18.24
95th-Percentile Queue Length [ft/ln]	17.73	527.86	151.02	718.28	290.45	115.13	253.89	16.90	448.21	456.12

**Movement, Approach, & Intersection Results**

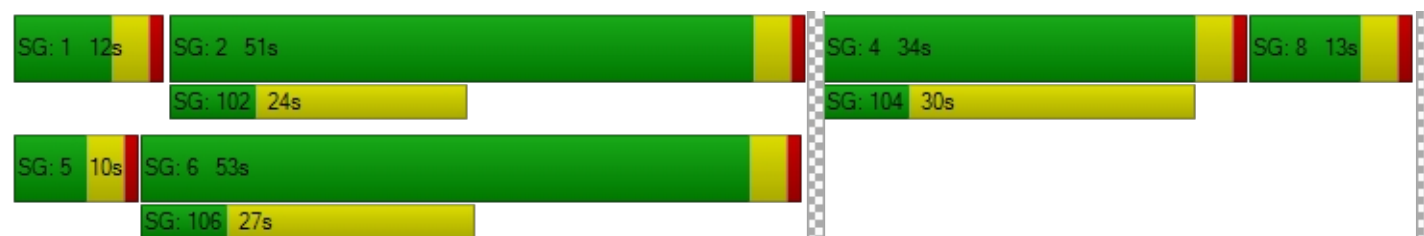
d_M, Delay for Movement [s/veh]	61.13	29.86	0.00	62.12	31.72	20.70	47.69	63.11	43.99	57.70	58.44	0.00
Movement LOS	E	C		E	C	C	D	E	D	E	E	
d_A, Approach Delay [s/veh]	30.05			32.92			57.31			57.81		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	37.04											
Intersection LOS	D											
Intersection V/C	0.898											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.190	2.261	2.304
Crosswalk LOS	F	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	855	891	164	545
d_b, Bicycle Delay [s]	18.04	16.91	46.37	29.09
I_b,int, Bicycle LOS Score for Intersection	2.628	2.760	2.063	2.860
Bicycle LOS	B	C	B	C

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	67.9
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.123

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	32	1908	32	522	2103	23	28	202	77	64	274	696
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	1908	32	522	2103	23	28	202	77	64	274	696
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	477	8	131	526	6	7	51	19	16	69	174
Total Analysis Volume [veh/h]	32	1908	32	522	2103	23	28	202	77	64	274	696
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	54	0	19	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	50	50	15	61	61	33	33	33	33	33	52
g / C, Green / Cycle	0.03	0.45	0.45	0.14	0.56	0.56	0.30	0.30	0.30	0.30	0.30	0.47
(v / s)_i Volume / Saturation Flow Rate	0.02	0.52	0.52	0.15	0.55	0.01	0.02	0.11	0.04	0.04	0.14	0.39
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	63	863	817	479	2113	1001	360	570	540	422	570	852
d1, Uniform Delay [s]	52.14	30.02	30.02	47.46	24.27	10.98	27.37	30.15	28.15	27.94	31.49	24.87
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.23	82.81	83.43	48.34	18.52	0.04	0.09	0.37	0.12	0.16	0.63	8.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	1.15	1.15	1.09	1.00	0.02	0.08	0.35	0.14	0.15	0.48	0.82
d, Delay for Lane Group [s/veh]	58.37	112.83	113.45	95.80	42.79	11.02	27.46	30.53	28.27	28.10	32.12	33.42
Lane Group LOS	E	F	F	F	D	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.98	41.62	39.58	9.74	30.55	0.26	0.54	4.24	1.51	1.25	6.02	17.02
50th-Percentile Queue Length [ft/ln]	24.40	1040.62	989.40	243.52	763.77	6.51	13.38	106.03	37.66	31.18	150.59	425.51
95th-Percentile Queue Length [veh/ln]	1.76	57.98	55.38	15.42	39.62	0.47	0.96	7.62	2.71	2.24	10.05	23.79
95th-Percentile Queue Length [ft/ln]	43.92	1449.52	1384.59	385.41	990.39	11.71	24.09	190.47	67.78	56.12	251.22	594.66

**Movement, Approach, & Intersection Results**

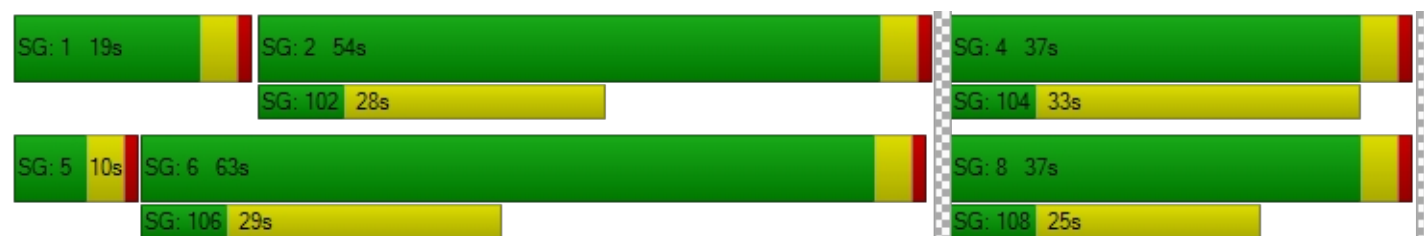
d_M, Delay for Movement [s/veh]	58.37	113.13	113.45	95.80	42.79	11.02	27.46	30.53	28.27	28.10	32.12	33.42
Movement LOS	E	F	F	F	D	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	112.25			52.97			29.68			32.75		
Approach LOS	F			D			C			C		
d_I, Intersection Delay [s/veh]	67.87											
Intersection LOS	E											
Intersection V/C	1.123											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.223			3.379			2.296			2.658		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			1073			600			600		
d_b, Bicycle Delay [s]	16.36			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.187			3.744			2.066			3.266		
Bicycle LOS	C			D			B			C		

**Sequence**




Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	507	478	153	121	344	22	29	409	336	96	549	152
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	507	478	153	121	344	22	29	409	336	96	549	152
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	127	120	38	30	86	6	7	102	84	24	137	38
Total Analysis Volume [veh/h]	507	478	153	121	344	22	29	409	336	96	549	152
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	37	0	0	30	0	0	43	43	0	43	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	36	36	36	36	26	26	66	26	26	26
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.33	0.24	0.24	0.60	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.27	0.27	0.09	0.07	0.20	0.02	0.22	0.19	0.05	0.20	0.18
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	589	589	589	589	589	148	449	1080	105	449	425
d1, Uniform Delay [s]	34.13	34.13	27.09	26.58	31.12	32.46	40.70	10.78	33.74	39.75	39.05
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.29	0.50	0.11	0.13	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.25	13.25	1.07	0.79	4.88	0.64	16.98	0.75	23.63	4.75	2.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.84	0.26	0.21	0.62	0.20	0.91	0.31	0.91	0.83	0.77
d, Delay for Lane Group [s/veh]	47.38	47.38	28.16	27.37	36.00	33.10	57.68	11.53	57.37	44.50	42.04
Lane Group LOS	D	D	C	C	D	C	E	B	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	14.12	14.12	3.12	2.42	8.90	0.63	12.74	4.07	2.76	10.07	8.52
50th-Percentile Queue Length [ft/ln]	353.04	353.04	78.08	60.41	222.47	15.68	318.58	101.77	68.99	251.63	213.05
95th-Percentile Queue Length [veh/ln]	20.28	20.28	5.62	4.35	13.79	1.13	18.60	7.33	4.97	15.27	13.31
95th-Percentile Queue Length [ft/ln]	507.12	507.12	140.55	108.73	344.78	28.22	464.94	183.18	124.19	381.71	332.74

**Movement, Approach, & Intersection Results**

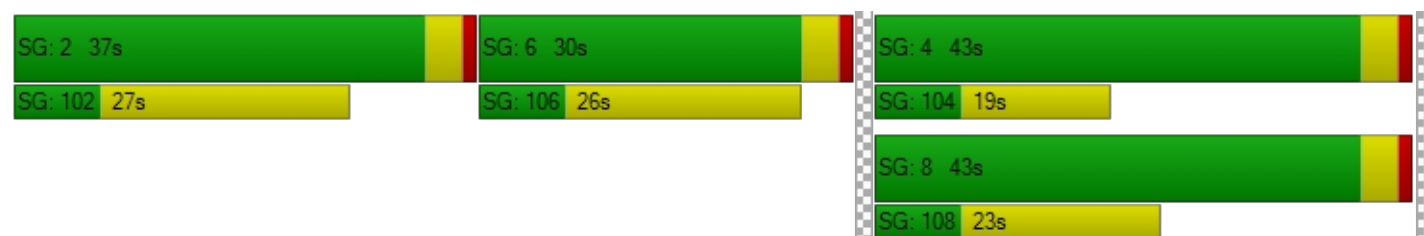
d_M, Delay for Movement [s/veh]	47.38	47.38	28.16	27.37	36.00	36.00	33.10	57.68	11.53	57.37	43.72	42.04
Movement LOS	D	D	C	C	D	D	C	E	B	E	D	D
d_A, Approach Delay [s/veh]	44.80			33.85			36.72			45.04		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	41.23											
Intersection LOS	D											
Intersection V/C	0.777											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.744			2.363			2.671			2.501		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			473			709			709		
d_b, Bicycle Delay [s]	26.95			32.07			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	3.437			2.363			2.837			2.217		
Bicycle LOS	C			B			C			B		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.452

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	29	245	186	458	538	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	245	186	458	538	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	61	47	115	135	6
Total Analysis Volume [veh/h]	29	245	186	458	538	24
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	46	46	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	85	85	85	85
g / C, Green / Cycle	0.16	0.16	0.77	0.77	0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.10	0.24	0.28	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	282	282	1237	1464	1464	1387
d1, Uniform Delay [s]	39.66	45.17	3.22	3.80	4.02	2.92
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.12	0.26	0.56	0.71	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.87	0.15	0.31	0.37	0.02
d, Delay for Lane Group [s/veh]	39.82	53.29	3.48	4.36	4.74	2.95
Lane Group LOS	D	D	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.69	7.11	0.94	2.72	3.39	0.11
50th-Percentile Queue Length [ft/ln]	17.14	177.79	23.62	67.96	84.69	2.73
95th-Percentile Queue Length [veh/ln]	1.23	11.48	1.70	4.89	6.10	0.20
95th-Percentile Queue Length [ft/ln]	30.85	287.12	42.51	122.32	152.45	4.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	39.82	53.29	3.48	4.36	4.74	2.95
Movement LOS	D	D	A	A	A	A
d_A, Approach Delay [s/veh]	51.86		4.10		4.66	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.16					
Intersection LOS	B					
Intersection V/C	0.452					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.372	2.414	2.291
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.195	5.060
Bicycle LOS	D	F	F

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 64s

SG: 101 26s

SG: 4 46s

SG: 104 21s

SG: 8 46s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	74.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.091

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	232	1470	151	213	1329	38	58	886	215	191	1164	301
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	232	1470	151	213	1329	38	58	886	215	191	1164	301
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	368	38	53	332	10	15	222	54	48	291	75
Total Analysis Volume [veh/h]	232	1470	151	213	1329	38	58	886	215	191	1164	301
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	47	0	10	45	0	10	43	0	10	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	53	43	43	53	41	41	49	39	39	49	40	40
g / C, Green / Cycle	0.48	0.39	0.39	0.48	0.37	0.37	0.44	0.35	0.35	0.44	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.13	0.44	0.44	0.12	0.37	0.37	0.03	0.31	0.29	0.11	0.40	0.39
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	317	745	706	257	711	673	252	671	635	370	688	652
d1, Uniform Delay [s]	16.86	33.42	33.42	16.66	34.23	34.11	17.57	33.24	32.29	19.02	35.08	35.08
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.36	0.32	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.93	71.14	69.36	6.75	31.52	31.07	0.46	11.04	7.27	1.11	69.63	56.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	1.12	1.11	0.83	0.99	0.98	0.23	0.87	0.81	0.52	1.11	1.07
d, Delay for Lane Group [s/veh]	30.79	104.57	102.78	23.41	65.75	65.18	18.03	44.28	39.57	20.13	104.71	91.08
Lane Group LOS	C	F	F	C	E	E	B	D	D	C	F	F
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.67	33.99	31.85	3.60	24.41	22.88	0.88	16.28	13.51	3.12	31.21	27.10
50th-Percentile Queue Length [ft/ln]	116.72	849.85	796.36	90.12	610.30	571.92	21.91	406.98	337.74	78.10	780.30	677.50
95th-Percentile Queue Length [veh/ln]	8.21	47.15	44.31	6.49	32.52	30.72	1.58	22.90	19.54	5.62	43.43	37.39
95th-Percentile Queue Length [ft/ln]	205.31	1178.87	1107.78	162.21	812.88	768.02	39.44	572.41	488.44	140.57	1085.65	934.67

**Movement, Approach, & Intersection Results**

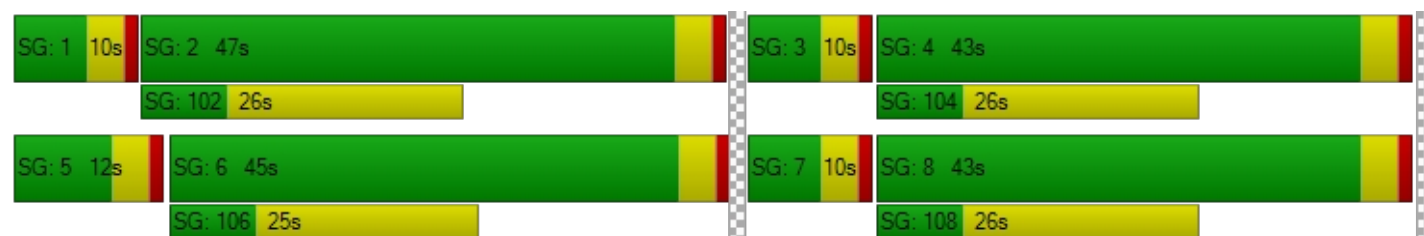
d_M, Delay for Movement [s/veh]	30.79	103.80	102.78	23.41	65.48	65.18	18.03	42.67	39.57	20.13	100.05	91.08
Movement LOS	C	F	F	C	E	E	B	D	D	C	F	F
d_A, Approach Delay [s/veh]	94.57			59.80			40.86			89.20		
Approach LOS	F			E			D			F		
d_I, Intersection Delay [s/veh]	74.39											
Intersection LOS	E											
Intersection V/C	1.091											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.110			3.006			2.944			3.000		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			745			709			709		
d_b, Bicycle Delay [s]	20.40			21.64			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	3.088			2.863			2.516			2.926		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	95.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.161

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	159	1446	235	187	1521	126	271	1027	153	308	1419	211
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	1446	235	187	1521	126	271	1027	153	308	1419	211
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	362	59	47	380	32	68	257	38	77	355	53
Total Analysis Volume [veh/h]	159	1446	235	187	1521	126	271	1027	153	308	1419	211
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	46	0	10	46	0	15	44	0	10	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	52	42	42	52	42	42	50	40	40	50	35	35
g / C, Green / Cycle	0.47	0.38	0.38	0.47	0.38	0.38	0.45	0.36	0.36	0.45	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.09	0.46	0.45	0.10	0.45	0.44	0.15	0.32	0.31	0.17	0.37	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	258	727	689	258	727	689	348	689	652	355	1205	571
d1, Uniform Delay [s]	16.70	33.95	33.95	16.99	33.95	33.95	19.34	33.10	32.55	19.82	37.57	29.06
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.12	0.38	0.36	0.12	0.15	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.52	100.05	95.69	3.83	89.33	87.25	4.25	13.32	10.70	6.80	82.94	0.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.62	1.19	1.18	0.72	1.17	1.16	0.78	0.90	0.86	0.87	1.18	0.37
d, Delay for Lane Group [s/veh]	27.23	134.00	129.64	20.83	123.28	121.20	23.59	46.42	43.25	26.62	120.51	29.46
Lane Group LOS	C	F	F	C	F	F	C	D	D	C	F	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.06	39.06	36.17	3.03	36.89	34.55	4.81	17.68	15.54	5.80	29.73	4.36
50th-Percentile Queue Length [ft/ln]	76.47	976.43	904.20	75.79	922.27	863.82	120.34	441.97	388.55	144.99	743.14	108.96
95th-Percentile Queue Length [veh/ln]	5.51	55.45	51.42	5.46	51.98	48.83	8.41	24.57	22.01	9.75	42.78	7.78
95th-Percentile Queue Length [ft/ln]	137.65	1386.37	1285.53	136.42	1299.61	1220.71	210.30	614.35	550.18	243.72	1069.62	194.55

**Movement, Approach, & Intersection Results**

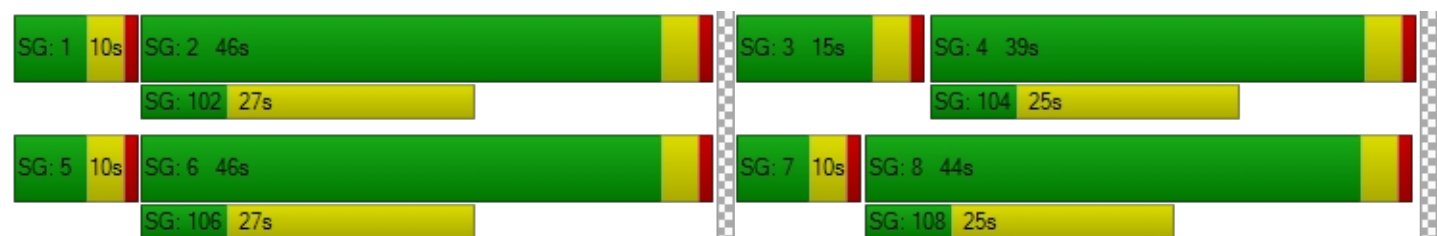
d_M, Delay for Movement [s/veh]	27.23	132.25	129.64	20.83	122.36	121.20	23.59	45.15	43.25	26.62	120.51	29.46
Movement LOS	C	F	F	C	F	F	C	D	D	C	F	C
d_A, Approach Delay [s/veh]	122.85			111.93			40.92			95.67		
Approach LOS	F			F			D			F		
d_I, Intersection Delay [s/veh]	95.73											
Intersection LOS	F											
Intersection V/C	1.161											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.260			3.172			3.015			3.119		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			764			727			636		
d_b, Bicycle Delay [s]	21.02			21.02			22.27			25.57		
I_b,int, Bicycle LOS Score for Intersection	3.078			3.073			2.757			3.158		
Bicycle LOS	C			C			C			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	58.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.038

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	175	1006	224	87	734	169	234	1182	152	462	1648	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	175	1006	224	87	734	169	234	1182	152	462	1648	129
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	252	56	22	184	42	59	296	38	116	412	32
Total Analysis Volume [veh/h]	175	1006	224	87	734	169	234	1182	152	462	1648	129
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	10	31	0	18	49	0	19	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	29	29	38	27	27	14	45	45	15	46	46
g / C, Green / Cycle	0.35	0.26	0.26	0.35	0.25	0.25	0.13	0.41	0.41	0.14	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.10	0.26	0.12	0.05	0.25	0.24	0.13	0.37	0.36	0.13	0.43	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	280	988	468	257	470	445	229	774	733	478	1582	749
d1, Uniform Delay [s]	25.96	40.71	34.40	24.62	41.42	40.79	48.00	30.46	30.02	47.26	32.12	20.20
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.39	0.37	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.07	33.23	3.48	0.77	46.69	32.40	32.91	12.34	10.59	12.85	23.76	0.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.62	1.02	0.48	0.34	1.02	0.95	1.02	0.90	0.87	0.97	1.04	0.17
d, Delay for Lane Group [s/veh]	36.02	73.94	37.88	25.39	88.10	73.19	80.91	42.80	40.60	60.11	55.87	20.30
Lane Group LOS	D	F	D	C	F	E	F	D	D	E	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.10	17.75	5.51	1.62	18.66	15.18	8.35	19.26	17.27	7.11	25.44	2.10
50th-Percentile Queue Length [ft/ln]	102.41	443.74	137.63	40.43	466.43	379.44	208.64	481.60	431.73	177.71	635.98	52.42
95th-Percentile Queue Length [veh/ln]	7.37	24.93	9.35	2.91	26.05	21.57	13.20	26.46	24.08	11.48	34.75	3.77
95th-Percentile Queue Length [ft/ln]	184.33	623.29	233.84	72.77	651.31	539.17	329.95	661.55	602.11	287.02	868.71	94.36

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	36.02	73.94	37.88	25.39	82.92	73.19	80.91	41.89	40.60	60.11	55.87	20.30
Movement LOS	D	F	D	C	F	E	F	D	D	E	F	C
d_A, Approach Delay [s/veh]	63.47			76.20			47.59			54.70		
Approach LOS	E			E			D			D		
d_I, Intersection Delay [s/veh]	58.32											
Intersection LOS	E											
Intersection V/C	1.038											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.910			2.769			3.069			3.158		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			818			836		
d_b, Bicycle Delay [s]	30.56			31.31			19.20			18.62		
I_b,int, Bicycle LOS Score for Intersection	2.719			2.376			2.853			3.407		
Bicycle LOS	B			B			C			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.855

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	12	65	61	530	64	92	72	1383	14	76	2130	581
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	65	61	530	64	92	72	1383	14	76	2130	581
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	16	15	133	16	23	18	346	4	19	533	145
Total Analysis Volume [veh/h]	12	65	61	530	64	92	72	1383	14	76	2130	581
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	22	32	0	10	78	0	0	68	68
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	6	6	18	28	74	74	74	65	65	87
g / C, Green / Cycle	0.05	0.05	0.05	0.16	0.25	0.67	0.67	0.67	0.59	0.59	0.79
(v / s)_i Volume / Saturation Flow Rate	0.01	0.03	0.03	0.15	0.09	0.04	0.38	0.38	0.04	0.56	0.32
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	101	95	573	456	376	1281	1214	741	2240	1421
d1, Uniform Delay [s]	49.68	51.10	51.08	45.34	33.61	6.08	9.39	9.37	9.68	21.10	3.60
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	6.77	6.96	6.91	0.44	0.24	1.78	1.86	0.28	10.53	0.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.65	0.64	0.92	0.34	0.19	0.56	0.56	0.10	0.95	0.41
d, Delay for Lane Group [s/veh]	51.01	57.87	58.04	52.26	34.06	6.33	11.17	11.24	9.96	31.63	4.47
Lane Group LOS	D	E	E	D	C	A	B	B	A	C	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.34	1.94	1.83	7.63	3.46	0.56	8.81	8.34	0.82	26.72	3.40
50th-Percentile Queue Length [ft/ln]	8.47	48.56	45.72	190.79	86.52	13.92	220.32	208.62	20.62	668.01	84.97
95th-Percentile Queue Length [veh/ln]	0.61	3.50	3.29	12.16	6.23	1.00	13.68	13.08	1.48	35.20	6.12
95th-Percentile Queue Length [ft/ln]	15.24	87.40	82.30	304.05	155.74	25.05	342.04	327.06	37.11	879.95	152.95

**Movement, Approach, & Intersection Results**

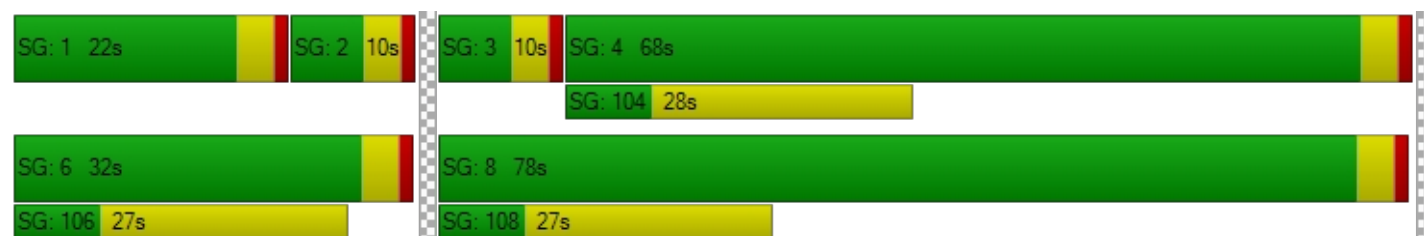
d_M, Delay for Movement [s/veh]	51.01	57.87	58.04	52.26	34.06	34.06	6.33	11.20	11.24	9.96	31.63	4.47
Movement LOS	D	E	E	D	C	C	A	B	B	A	C	A
d_A, Approach Delay [s/veh]	57.35			48.12			10.96			25.37		
Approach LOS	E			D			B			C		
d_I, Intersection Delay [s/veh]	25.15											
Intersection LOS	C											
Intersection V/C	0.855											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.320			2.545			3.049			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			509			1345			1164		
d_b, Bicycle Delay [s]	49.16			30.56			5.89			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.787			2.692			2.772			3.859		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	83.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.048

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	360	283	352	68	172	67	65	1627	175	333	2314	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	283	352	68	172	67	65	1627	175	333	2314	110
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	71	88	17	43	17	16	407	44	83	579	28
Total Analysis Volume [veh/h]	360	283	352	68	172	67	65	1627	175	333	2314	110
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	57	0	13	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	33	24	24	33	23	23	69	53	53	69	59	59
g / C, Green / Cycle	0.30	0.22	0.22	0.30	0.21	0.21	0.62	0.48	0.48	0.62	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.20	0.15	0.20	0.04	0.07	0.06	0.04	0.49	0.49	0.19	0.66	0.66
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	536	415	393	389	402	381	244	921	873	358	1028	974
d1, Uniform Delay [s]	33.43	39.48	41.77	27.79	36.61	36.48	8.05	28.33	28.33	9.52	25.26	25.26
k, delay calibration	0.26	0.12	0.24	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.42	2.15	14.52	0.21	0.44	0.43	0.58	31.35	30.81	33.01	104.19	104.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.67	0.68	0.90	0.17	0.31	0.30	0.27	1.01	1.00	0.93	1.21	1.21
d, Delay for Lane Group [s/veh]	36.85	41.63	56.29	28.00	37.05	36.91	8.62	59.69	59.14	42.53	129.44	129.91
Lane Group LOS	D	D	E	C	D	D	A	F	F	D	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.80	7.23	10.77	1.32	2.91	2.60	0.62	31.05	29.29	6.79	54.71	51.95
50th-Percentile Queue Length [ft/ln]	219.90	180.67	269.23	33.10	72.71	65.05	15.47	776.33	732.15	169.81	1367.67	1298.84
95th-Percentile Queue Length [veh/ln]	13.66	11.64	16.15	2.38	5.24	4.68	1.11	40.42	38.21	11.07	77.23	73.65
95th-Percentile Queue Length [ft/ln]	341.50	290.89	403.78	59.59	130.88	117.09	27.85	1010.49	955.14	276.67	1930.80	1841.16

**Movement, Approach, & Intersection Results**

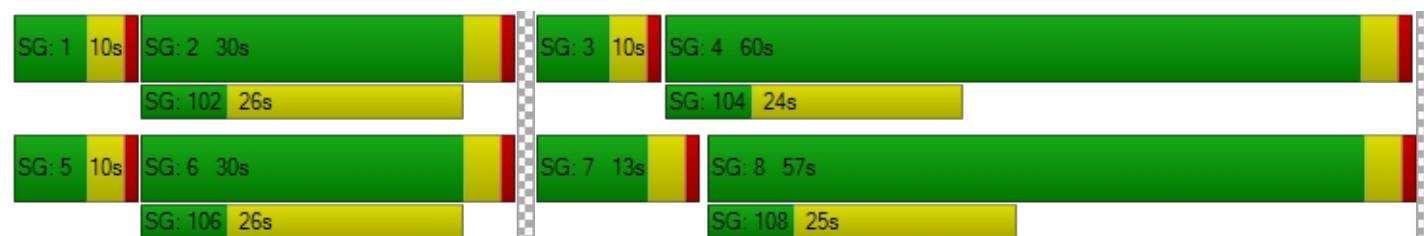
d_M, Delay for Movement [s/veh]	36.85	41.63	56.29	28.00	37.01	36.91	8.62	59.45	59.14	42.53	129.66	129.91
Movement LOS	D	D	E	C	D	D	A	E	E	D	F	F
d_A, Approach Delay [s/veh]	45.09			35.00			57.65			119.15		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	82.98											
Intersection LOS	F											
Intersection V/C	1.048											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.874			2.379			3.487			3.269		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			964			1018		
d_b, Bicycle Delay [s]	32.07			32.07			14.77			13.25		
I_b,int, Bicycle LOS Score for Intersection	3.201			1.813			3.100			3.834		
Bicycle LOS	C			A			C			D		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.907

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	254	259	58	124	76	50	1936	106	123	2371	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	254	259	58	124	76	50	1936	106	123	2371	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	64	65	15	31	19	13	484	27	31	593	14
Total Analysis Volume [veh/h]	116	254	259	58	124	76	50	1936	106	123	2371	56
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	68	0	11	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	19	83	74	74	83	75	75
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.17	0.76	0.67	0.67	0.76	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.14	0.03	0.11	0.03	0.55	0.55	0.07	0.66	0.66
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	151	320	303	107	303	347	1270	1203	709	1290	1222
d1, Uniform Delay [s]	40.64	43.88	44.41	39.28	42.77	3.29	13.50	13.50	3.43	16.48	16.48
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.89	4.45	6.80	4.18	2.44	0.19	6.22	6.55	0.53	18.18	18.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.79	0.85	0.54	0.66	0.14	0.83	0.83	0.17	0.97	0.97
d, Delay for Lane Group [s/veh]	48.53	48.34	51.21	43.46	45.21	3.48	19.72	20.04	3.97	34.66	35.30
Lane Group LOS	D	D	D	D	D	A	B	C	A	C	D
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.12	7.00	7.39	1.47	5.27	0.25	19.13	18.23	0.70	31.56	30.12
50th-Percentile Queue Length [ft/ln]	78.09	174.97	184.64	36.86	131.82	6.22	478.23	455.74	17.43	788.95	752.90
95th-Percentile Queue Length [veh/ln]	5.62	11.34	11.84	2.65	9.04	0.45	26.30	25.23	1.25	40.77	39.12
95th-Percentile Queue Length [ft/ln]	140.56	283.43	296.06	66.34	225.97	11.20	657.55	630.79	31.37	1019.27	977.90

**Movement, Approach, & Intersection Results**

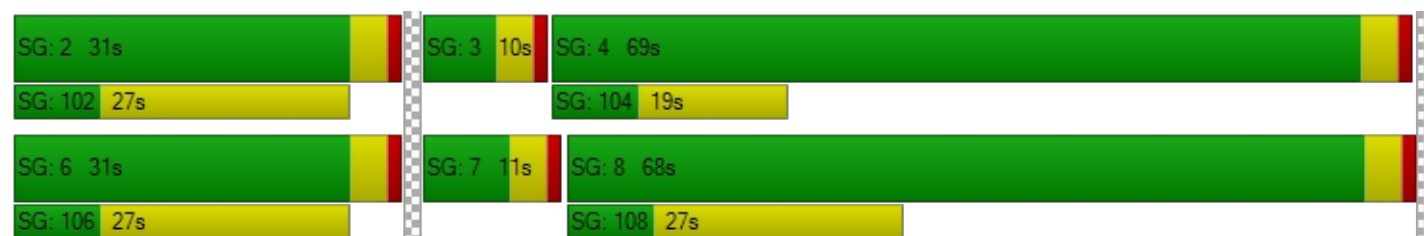
d_M, Delay for Movement [s/veh]	48.53	48.34	51.21	43.46	45.21	45.21	3.48	19.87	20.04	3.97	34.97	35.30
Movement LOS	D	D	D	D	D	D	A	B	C	A	C	D
d_A, Approach Delay [s/veh]	49.55			44.82			19.49			33.48		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	30.54											
Intersection LOS	C											
Intersection V/C	0.907											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.500			2.200			3.382			3.328		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1164			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.62			9.20		
I_b,int, Bicycle LOS Score for Intersection	2.597			1.985			3.286			3.663		
Bicycle LOS	B			A			C			D		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	131.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.221

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	137	613	231	328	491	631	557	1526	78	473	1802	289
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	613	231	328	491	631	557	1526	78	473	1802	289
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	153	58	82	123	158	139	382	20	118	451	72
Total Analysis Volume [veh/h]	137	613	231	328	491	631	557	1526	78	473	1802	289
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	14	37	37	17	37	0	25	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	30	30	10	33	50	13	33	33	21	41	41
g / C, Green / Cycle	0.06	0.27	0.27	0.09	0.30	0.46	0.12	0.30	0.30	0.19	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.16	0.13	0.09	0.13	0.35	0.16	0.40	0.04	0.26	0.47	0.16
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	115	1042	493	319	1145	821	415	1134	537	344	1409	668
d1, Uniform Delay [s]	51.50	34.57	33.27	50.01	30.85	25.07	48.51	38.61	28.32	44.52	34.62	25.94
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.21	0.11	0.42	0.19	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	102.63	2.44	3.17	30.66	1.18	6.84	158.29	158.31	0.12	184.12	127.59	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.19	0.59	0.47	1.03	0.43	0.77	1.34	1.35	0.15	1.38	1.28	0.43
d, Delay for Lane Group [s/veh]	154.13	37.01	36.44	80.67	32.02	31.90	206.80	196.92	28.44	228.64	162.21	26.39
Lane Group LOS	F	D	D	F	C	C	F	F	C	F	F	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.45	7.41	5.55	5.73	5.40	14.93	14.77	39.90	1.53	26.86	43.25	5.70
50th-Percentile Queue Length [ft/ln]	161.30	185.34	138.86	143.32	134.98	373.22	369.24	997.54	38.24	671.58	1081.30	142.50
95th-Percentile Queue Length [veh/ln]	11.17	11.88	9.42	9.75	9.21	21.27	23.53	59.30	2.75	40.92	63.04	9.62
95th-Percentile Queue Length [ft/ln]	279.28	296.97	235.49	243.82	230.24	531.63	588.13	1482.58	68.84	1022.94	1576.09	240.39

**Movement, Approach, & Intersection Results**

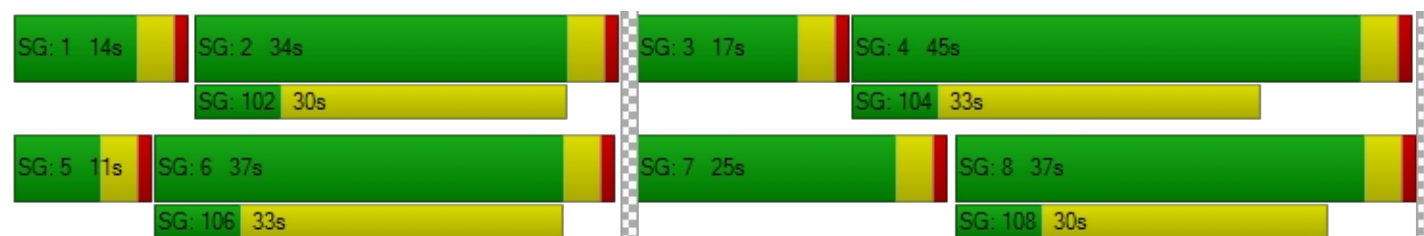
d_M, Delay for Movement [s/veh]	154.13	37.01	36.44	80.67	32.02	31.90	206.80	196.92	28.44	228.64	162.21	26.39
Movement LOS	F	D	D	F	C	C	F	F	C	F	F	C
d_A, Approach Delay [s/veh]	53.23			42.98			193.39			159.15		
Approach LOS	D			D			F			F		
d_I, Intersection Delay [s/veh]	131.43											
Intersection LOS	F											
Intersection V/C	1.221											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.791			3.009			3.262			3.218		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			600			745		
d_b, Bicycle Delay [s]	29.09			26.95			26.95			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.369			2.756			3.342			3.675		
Bicycle LOS	B			C			C			D		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.924

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	33	59	104	0	411	209	58	515	0
Total Analysis Volume [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	33	0	0	59	0	18	77	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		27	27	55	55	16	75
g / C, Green / Cycle		0.25	0.25	0.50	0.50	0.14	0.68
(v / s)_i Volume / Saturation Flow Rate		0.20	0.23	0.43	0.46	0.13	0.54
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		450	450	1896	898	256	2574
d1, Uniform Delay [s]		38.90	40.28	24.30	25.71	46.43	12.49
k, delay calibration		0.27	0.34	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		8.71	21.15	5.60	17.00	11.30	2.72
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.82	0.93	0.87	0.93	0.90	0.80
d, Delay for Lane Group [s/veh]		47.61	61.43	29.90	42.71	57.73	15.21
Lane Group LOS		D	E	C	D	E	B
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		10.36	13.51	19.42	23.53	6.99	16.65
50th-Percentile Queue Length [ft/ln]		258.88	337.87	485.39	588.18	174.69	416.30
95th-Percentile Queue Length [veh/ln]		15.63	19.54	26.64	31.48	11.32	23.34
95th-Percentile Queue Length [ft/ln]		390.81	488.59	666.05	787.05	283.07	583.60

**Movement, Approach, & Intersection Results**

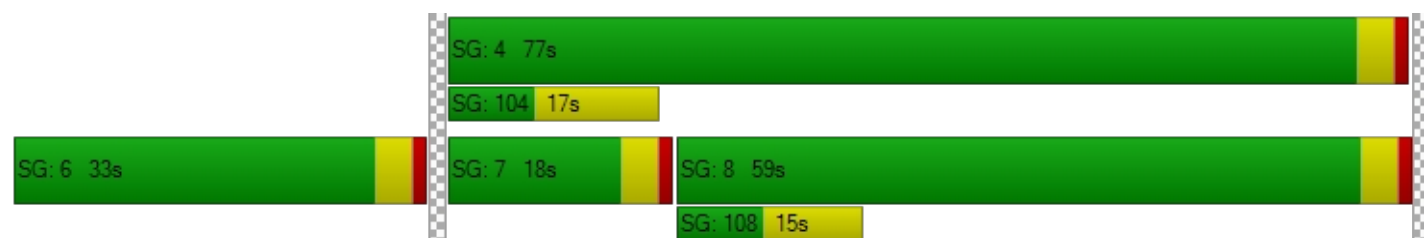
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	47.61	47.61	61.43	0.00	29.90	42.71	57.73	15.21	0.00
Movement LOS				D	D	E		C	D	E	B	
d_A, Approach Delay [s/veh]	0.00			54.95			34.22			19.50		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	31.07											
Intersection LOS	C											
Intersection V/C	0.924											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.701	2.107	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	527	1000	1327
d_b, Bicycle Delay [s]	55.00	29.82	13.75	6.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.855	2.921	3.450
Bicycle LOS	D	C	C	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	87.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.102

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	212	0	136	0	0	0	106	334	0	0	384	57
Total Analysis Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	28	0	0	0	0	0	26	82	0	0	56	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		28	78	46	46
g / C, Green / Cycle	0.22	0.22	0.22		0.26	0.71	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.26		0.24	0.35	0.46	0.49
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	393	393	393		462	2693	790	749
d1, Uniform Delay [s]	42.97	42.97	42.97		39.76	7.19	32.11	32.11
k, delay calibration	0.41	0.41	0.41		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	99.74	99.74	99.74		7.82	0.65	68.11	92.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.18	1.18	1.18		0.92	0.50	1.11	1.18
d, Delay for Lane Group [s/veh]	142.72	142.72	142.72		47.59	7.84	100.22	125.01
Lane Group LOS	F	F	F		D	A	F	F
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	21.46	21.46	21.46		12.00	6.42	35.19	38.49
50th-Percentile Queue Length [ft/ln]	536.48	536.48	536.48		300.03	160.49	879.81	962.37
95th-Percentile Queue Length [veh/ln]	31.68	31.68	31.68		17.68	10.57	48.55	54.45
95th-Percentile Queue Length [ft/ln]	791.95	791.95	791.95		442.07	264.37	1213.85	1361.20

**Movement, Approach, & Intersection Results**

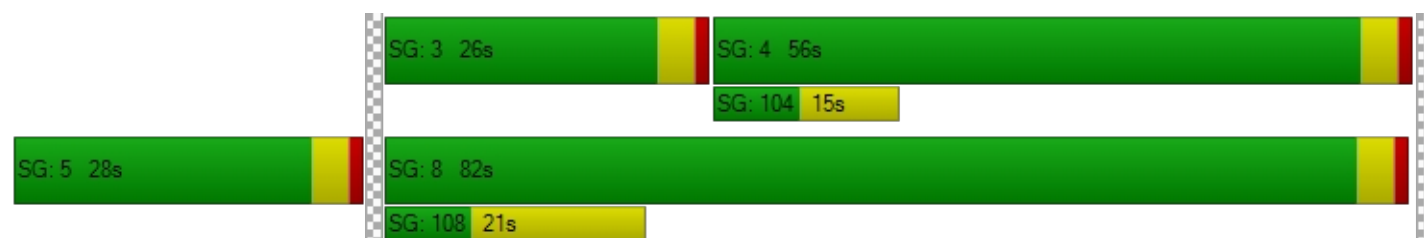
d_M, Delay for Movement [s/veh]	142.72	0.00	142.72	0.00	0.00	0.00	47.59	7.84	0.00	0.00	110.79	125.01
Movement LOS	F		F				D	A			F	F
d_A, Approach Delay [s/veh]	142.72			0.00			17.43			112.62		
Approach LOS	F			A			B			F		
d_I, Intersection Delay [s/veh]	87.04											
Intersection LOS	F											
Intersection V/C	1.102											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.401	2.067	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1418	945
d_b, Bicycle Delay [s]	55.00	55.00	4.65	15.29
I_b,int, Bicycle LOS Score for Intersection	6.424	4.132	3.010	3.012
Bicycle LOS	F	D	C	C

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.581

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	48	1373	85	70	1219	49	21	46	51	105	55	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	1373	85	70	1219	49	21	46	51	105	55	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	343	21	18	305	12	5	12	13	26	14	24
Total Analysis Volume [veh/h]	48	1373	85	70	1219	49	21	46	51	105	55	96
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	49	0	0	49	0	0	61	0	0	61	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18
g / C, Green / Cycle	0.77	0.77	0.77	0.77	0.77	0.77	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.40	0.39	0.04	0.34	0.34	0.07	0.14
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1172	1456	1380	1116	1456	1380	328	335
d1, Uniform Delay [s]	3.07	4.96	4.91	3.11	4.56	4.53	41.35	45.05
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	1.32	1.35	0.11	1.01	1.04	0.67	3.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.52	0.51	0.06	0.45	0.44	0.36	0.76
d, Delay for Lane Group [s/veh]	3.14	6.28	6.26	3.22	5.57	5.57	42.02	48.67
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.23	5.85	5.44	0.34	4.66	4.35	2.93	7.11
50th-Percentile Queue Length [ft/ln]	5.78	146.35	135.90	8.58	116.49	108.85	73.21	177.87
95th-Percentile Queue Length [veh/ln]	0.42	9.82	9.26	0.62	8.20	7.78	5.27	11.49
95th-Percentile Queue Length [ft/ln]	10.40	245.54	231.50	15.45	205.00	194.40	131.77	287.23

**Movement, Approach, & Intersection Results**

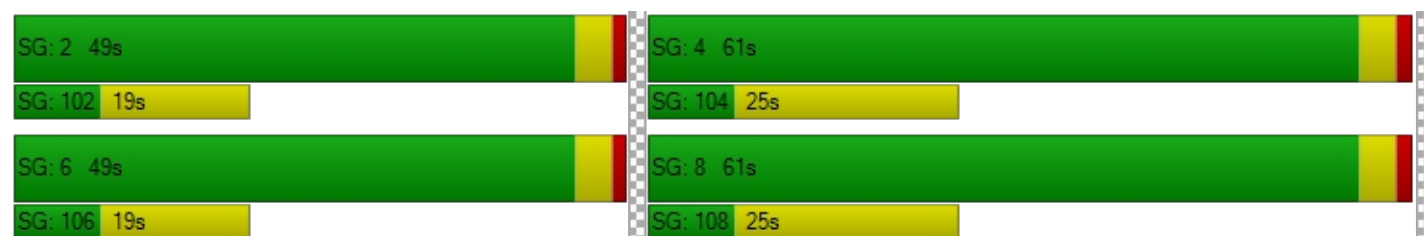
d_M, Delay for Movement [s/veh]	3.14	6.27	6.26	3.22	5.57	5.57	42.02	42.02	42.02	48.67	48.67	48.67
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	6.17			5.45			42.02			48.67		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	10.56											
Intersection LOS	B											
Intersection V/C	0.581											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.021			2.891			1.924			2.047		
Crosswalk LOS	C			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			818			1036			1036		
d_b, Bicycle Delay [s]	19.20			19.20			12.77			12.77		
I_b,int, Bicycle LOS Score for Intersection	2.802			2.663			1.754			1.982		
Bicycle LOS	C			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	61.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.124

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	230	1541	283	115	1760	148	166	807	211	293	1192	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1541	283	115	1760	148	166	807	211	293	1192	139
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	385	71	29	440	37	42	202	53	73	298	35
Total Analysis Volume [veh/h]	230	1541	283	115	1760	148	166	807	211	293	1192	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	55	0	10	55	0	10	35	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	61	51	51	61	51	51	41	31	31	41	31	31
g / C, Green / Cycle	0.55	0.47	0.47	0.55	0.46	0.46	0.37	0.28	0.28	0.37	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.13	0.41	0.16	0.06	0.52	0.52	0.09	0.21	0.12	0.16	0.31	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	263	1767	837	435	880	834	267	1065	504	415	1065	505
d1, Uniform Delay [s]	12.53	26.48	18.68	11.67	29.52	29.52	23.82	36.18	32.28	25.83	39.58	30.86
k, delay calibration	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.79	1.46	0.24	0.32	66.27	66.97	2.36	5.06	2.54	9.69	66.26	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.87	0.87	0.34	0.26	1.11	1.11	0.62	0.76	0.42	0.71	1.12	0.28
d, Delay for Lane Group [s/veh]	21.31	27.95	18.92	11.99	95.79	96.48	26.18	41.24	34.82	35.52	105.84	32.21
Lane Group LOS	C	C	B	B	F	F	C	D	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.47	17.80	4.57	1.36	38.37	36.51	3.15	10.53	4.92	6.81	23.94	3.06
50th-Percentile Queue Length [ft/ln]	86.82	445.12	114.37	33.93	959.22	912.73	78.79	263.18	122.97	170.37	598.40	76.61
95th-Percentile Queue Length [veh/ln]	6.25	24.72	8.08	2.44	52.59	50.29	5.67	15.85	8.56	11.10	34.21	5.52
95th-Percentile Queue Length [ft/ln]	156.28	618.12	202.07	61.07	1314.85	1257.20	141.83	396.21	213.90	277.40	855.20	137.89

**Movement, Approach, & Intersection Results**

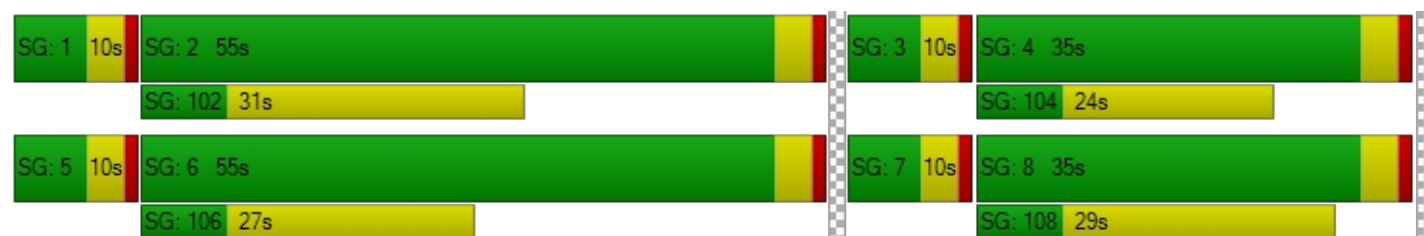
d_M, Delay for Movement [s/veh]	21.31	27.95	18.92	11.99	96.10	96.48	26.18	41.24	34.82	35.52	105.84	32.21
Movement LOS	C	C	B	B	F	F	C	D	C	D	F	C
d_A, Approach Delay [s/veh]	25.96			91.34			37.98			86.85		
Approach LOS	C			F			D			F		
d_I, Intersection Delay [s/veh]	61.60											
Intersection LOS	E											
Intersection V/C	1.124											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.343			3.135			3.068			3.001		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			927			564			564		
d_b, Bicycle Delay [s]	15.82			15.82			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	3.254			3.229			2.536			2.899		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	51.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.009

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	154	1195	271	47	1102	122	197	952	122	523	1374	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	1195	271	47	1102	122	197	952	122	523	1374	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	299	68	12	276	31	49	238	31	131	344	23
Total Analysis Volume [veh/h]	154	1195	271	47	1102	122	197	952	122	523	1374	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	10	41	0	16	37	0	22	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	47	38	38	47	37	37	12	33	33	18	39	39
g / C, Green / Cycle	0.43	0.35	0.35	0.43	0.34	0.34	0.11	0.30	0.30	0.16	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.31	0.15	0.03	0.34	0.33	0.11	0.25	0.07	0.15	0.36	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	264	1326	628	326	638	605	200	1137	539	577	1341	635
d1, Uniform Delay [s]	19.75	34.00	27.44	18.55	36.52	35.94	48.81	36.04	28.97	45.12	35.59	24.24
k, delay calibration	0.11	0.11	0.11	0.11	0.46	0.44	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.05	2.53	0.47	0.20	34.18	27.14	26.41	7.39	0.98	5.79	30.96	0.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.58	0.90	0.43	0.14	1.00	0.97	0.99	0.84	0.23	0.91	1.02	0.14
d, Delay for Lane Group [s/veh]	21.80	36.53	27.91	18.75	70.70	63.08	75.22	43.43	29.95	50.91	66.55	24.71
Lane Group LOS	C	D	C	B	F	E	E	D	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.61	15.29	5.51	0.72	22.79	19.66	6.84	12.93	2.57	7.43	23.25	1.68
50th-Percentile Queue Length [ft/ln]	65.31	382.13	137.66	18.10	569.79	491.40	171.05	323.27	64.25	185.68	581.25	42.01
95th-Percentile Queue Length [veh/ln]	4.70	21.70	9.35	1.30	30.62	26.93	11.13	18.83	4.63	11.90	31.69	3.02
95th-Percentile Queue Length [ft/ln]	117.55	542.42	233.86	32.57	765.62	673.17	278.29	470.70	115.64	297.42	792.23	75.62

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	21.80	36.53	27.91	18.75	67.49	63.08	75.22	43.43	29.95	50.91	66.55	24.71
Movement LOS	C	D	C	B	E	E	E	D	C	D	F	C
d_A, Approach Delay [s/veh]	33.69			65.27			47.06			60.54		
Approach LOS	C			E			D			E		
d_I, Intersection Delay [s/veh]	51.66											
Intersection LOS	D											
Intersection V/C	1.009											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.010			2.846			3.015			3.082		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			673			600			709		
d_b, Bicycle Delay [s]	24.22			24.22			26.95			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.896			2.608			2.608			3.199		
Bicycle LOS	C			B			B			C		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	78.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.182

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	94	1841	65	189	540	1508	113	171	181	156	217	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	1841	65	189	540	1508	113	171	181	156	217	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	460	16	47	135	377	28	43	45	39	54	29
Total Analysis Volume [veh/h]	94	1841	65	189	540	1508	113	171	181	156	217	115
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	40	0	0	40	0	0	70	0	0	70	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	71	71	71	71	71	31	31	31
g / C, Green / Cycle	0.65	0.65	0.65	0.65	0.65	0.65	0.28	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.05	0.52	0.52	0.11	0.28	0.84	0.26	0.09	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	68	1233	1168	539	1233	1168	542	81	501
d1, Uniform Delay [s]	7.04	13.97	13.97	7.57	9.46	19.29	38.56	29.95	35.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	238.96	5.32	5.60	1.79	1.13	137.56	4.09	428.46	1.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.38	0.79	0.79	0.35	0.44	1.29	0.86	1.93	0.66
d, Delay for Lane Group [s/veh]	246.00	19.29	19.57	9.36	10.59	156.85	42.65	458.40	36.58
Lane Group LOS	F	B	B	A	B	F	D	F	D
Critical Lane Group	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.08	17.67	16.83	1.93	6.31	70.74	12.61	11.24	8.00
50th-Percentile Queue Length [ft/ln]	127.05	441.85	420.87	48.16	157.81	1768.56	315.28	280.92	199.98
95th-Percentile Queue Length [veh/ln]	9.15	24.57	23.56	3.47	10.43	102.82	18.44	20.23	12.64
95th-Percentile Queue Length [ft/ln]	228.70	614.22	589.09	86.69	260.82	2570.62	460.88	505.65	315.94

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	246.00	19.42	19.57	9.36	10.59	156.85	42.65	42.65	42.65	458.40	36.58	36.58
Movement LOS	F	B	B	A	B	F	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	30.07			109.08			42.65			171.43		
Approach LOS	C			F			D			F		
d_I, Intersection Delay [s/veh]	78.54											
Intersection LOS	E											
Intersection V/C	1.182											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.092			3.310			2.972			2.515		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			655			1200			1200		
d_b, Bicycle Delay [s]	24.89			24.89			8.80			8.80		
I_b,int, Bicycle LOS Score for Intersection	3.210			3.405			2.327			2.365		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.735

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	223	1602	94	58	1593	203	125	43	182	105	55	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	223	1602	94	58	1593	203	125	43	182	105	55	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	401	24	15	398	51	31	11	46	26	14	12
Total Analysis Volume [veh/h]	223	1602	94	58	1593	203	125	43	182	105	55	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	36	0	0	36	0	0	74	0	0	74	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	78	78	78	78	78	78	24	24
g / C, Green / Cycle	0.71	0.71	0.71	0.71	0.71	0.71	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.12	0.46	0.46	0.03	0.49	0.48	0.19	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	827	1355	1284	878	1355	1284	430	434
d1, Uniform Delay [s]	5.16	8.35	8.34	4.67	8.81	8.75	42.12	38.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.80	2.36	2.48	0.14	2.81	2.90	3.80	0.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.64	0.64	0.07	0.68	0.68	0.81	0.48
d, Delay for Lane Group [s/veh]	5.96	10.71	10.82	4.81	11.62	11.65	45.92	39.21
Lane Group LOS	A	B	B	A	B	B	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.68	10.36	9.84	0.39	11.68	10.95	9.62	5.09
50th-Percentile Queue Length [ft/ln]	42.07	259.08	246.07	9.70	292.03	273.86	240.53	127.22
95th-Percentile Queue Length [veh/ln]	3.03	15.64	14.99	0.70	17.29	16.38	14.71	8.79
95th-Percentile Queue Length [ft/ln]	75.72	391.06	374.70	17.47	432.16	409.55	367.71	219.71

**Movement, Approach, & Intersection Results**

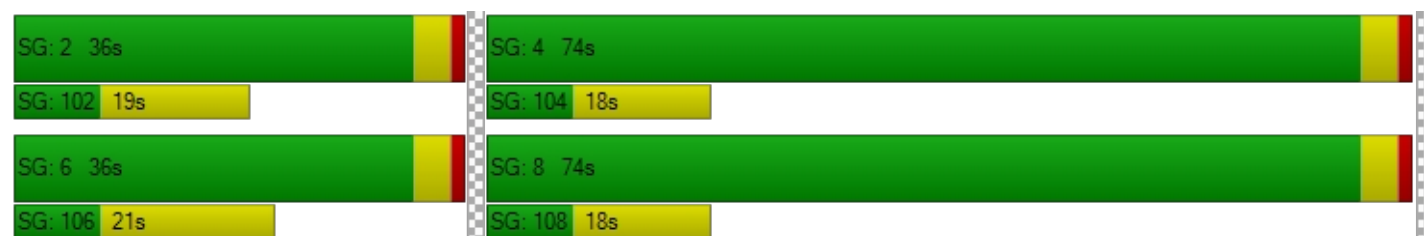
d_M, Delay for Movement [s/veh]	5.96	10.76	10.82	4.81	11.63	11.65	45.92	45.92	45.92	39.21	39.21	39.21
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.20			11.42			45.92			39.21		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	15.01											
Intersection LOS	B											
Intersection V/C	0.735											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.200			3.195			2.447			2.004		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			582			1273			1273		
d_b, Bicycle Delay [s]	27.65			27.65			7.27			7.27		
I_b,int, Bicycle LOS Score for Intersection	3.143			3.089			2.137			1.904		
Bicycle LOS	C			C			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	117.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.126

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	346	1953	277	228	1736	212	244	943	237	286	1409	261
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	346	1953	277	228	1736	212	244	943	237	286	1409	261
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	488	69	57	434	53	61	236	59	72	352	65
Total Analysis Volume [veh/h]	346	1953	277	228	1736	212	244	943	237	286	1409	261
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	44	0	10	42	0	19	39	0	17	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	40	40	6	38	38	15	35	35	13	33	33
g / C, Green / Cycle	0.07	0.36	0.36	0.05	0.35	0.35	0.14	0.32	0.32	0.12	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.10	0.51	0.15	0.07	0.42	0.20	0.14	0.17	0.13	0.16	0.25	0.15
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1380	654	191	1311	621	248	1805	570	216	1702	538
d1, Uniform Delay [s]	51.00	35.02	26.35	52.00	36.02	29.60	47.28	30.77	29.58	48.40	35.94	31.64
k, delay calibration	0.11	0.24	0.11	0.11	0.17	0.15	0.11	0.50	0.50	0.14	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	167.08	188.78	0.44	98.31	95.66	1.26	22.59	1.09	2.23	154.94	4.78	3.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.36	1.41	0.42	1.19	1.21	0.59	0.98	0.52	0.42	1.32	0.83	0.49
d, Delay for Lane Group [s/veh]	218.08	223.80	26.79	150.31	131.68	30.86	69.87	31.86	31.81	203.34	40.72	34.76
Lane Group LOS	F	F	C	F	F	C	E	C	C	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.40	54.15	5.50	5.23	34.57	8.07	8.19	6.95	5.26	15.20	12.31	6.12
50th-Percentile Queue Length [ft/ln]	235.07	1353.83	137.57	130.87	864.14	201.66	204.63	173.81	131.49	379.94	307.85	153.05
95th-Percentile Queue Length [veh/ln]	15.80	80.99	9.35	9.42	49.78	12.72	12.88	11.28	9.02	24.02	18.07	10.18
95th-Percentile Queue Length [ft/ln]	395.05	2024.76	233.75	235.55	1244.45	318.10	321.93	281.91	225.51	600.44	451.73	254.49

**Movement, Approach, & Intersection Results**

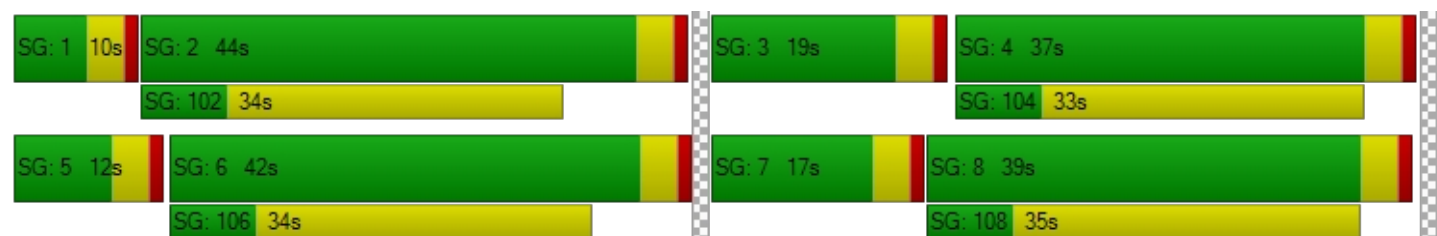
d_M, Delay for Movement [s/veh]	218.08	223.80	26.79	150.31	122.77	30.86	69.87	31.86	31.81	203.34	40.72	34.76
Movement LOS	F	F	C	F	F	C	E	C	C	F	D	C
d_A, Approach Delay [s/veh]	201.85			116.70			38.36			63.70		
Approach LOS	F			F			D			E		
d_I, Intersection Delay [s/veh]	117.21											
Intersection LOS	F											
Intersection V/C	1.126											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.324			3.249			3.148			3.150		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	727			691			636			600		
d_b, Bicycle Delay [s]	22.27			23.56			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.685			2.756			2.343			2.635		
Bicycle LOS	D			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	91.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.161

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	320	1529	121	216	1414	230	252	907	240	471	1138	191
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	320	1529	121	216	1414	230	252	907	240	471	1138	191
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	382	30	54	354	58	63	227	60	118	285	48
Total Analysis Volume [veh/h]	320	1529	121	216	1414	230	252	907	240	471	1138	191
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	42	0	13	39	0	17	35	0	20	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	38	38	51	35	35	13	31	31	16	34	34
g / C, Green / Cycle	0.46	0.35	0.35	0.46	0.32	0.32	0.12	0.28	0.28	0.15	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.18	0.40	0.07	0.12	0.37	0.13	0.14	0.24	0.13	0.13	0.36	0.36
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	362	1312	621	312	1208	572	216	1067	505	514	585	554
d1, Uniform Delay [s]	19.27	36.02	25.29	18.00	37.52	29.34	48.41	37.37	32.83	46.27	38.08	38.08
k, delay calibration	0.11	0.15	0.11	0.11	0.15	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.27	77.41	0.15	2.73	79.73	0.46	86.52	8.49	3.18	7.03	95.96	90.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.89	1.17	0.19	0.69	1.17	0.40	1.17	0.85	0.47	0.92	1.18	1.16
d, Delay for Lane Group [s/veh]	26.54	113.43	25.44	20.73	117.25	29.80	134.93	45.86	36.00	53.30	134.04	128.26
Lane Group LOS	C	F	C	C	F	C	F	D	D	D	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.99	31.24	2.25	3.55	29.27	4.81	11.08	12.62	5.73	6.82	31.00	28.48
50th-Percentile Queue Length [ft/ln]	149.70	781.12	56.18	88.83	731.81	120.17	276.92	315.60	143.24	170.39	774.96	711.93
95th-Percentile Queue Length [veh/ln]	10.00	44.61	4.04	6.40	42.06	8.40	17.59	18.45	9.66	11.10	44.33	40.78
95th-Percentile Queue Length [ft/ln]	250.02	1115.18	101.12	159.90	1051.59	210.07	439.83	461.27	241.39	277.43	1108.36	1019.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	26.54	113.43	25.44	20.73	117.25	29.80	134.93	45.86	36.00	53.30	131.75	128.26
Movement LOS	C	F	C	C	F	C	F	D	D	D	F	F
d_A, Approach Delay [s/veh]	93.91			95.23			60.21			110.85		
Approach LOS	F			F			E			F		
d_I, Intersection Delay [s/veh]	91.89											
Intersection LOS	F											
Intersection V/C	1.161											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.128			3.085			3.117			3.139		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			564			618		
d_b, Bicycle Delay [s]	23.56			25.57			28.37			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.185			3.094			2.329			3.045		
Bicycle LOS	C			C			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	644	0	0	459	209	0	0	0	85	117	139
Total Analysis Volume [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	51	51		32	32	32
g / C, Green / Cycle	0.05	0.60	0.51	0.51		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.45	0.47	0.49		0.19	0.12	0.31
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	194	3421	1918	909		576	1216	576
d1, Uniform Delay [s]	45.74	14.59	23.07	24.26		28.48	26.39	33.41
k, delay calibration	0.11	0.50	0.50	0.50		0.15	0.11	0.43
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.58	9.40	25.36		1.32	0.20	26.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.75	0.93	0.98		0.59	0.39	0.96
d, Delay for Lane Group [s/veh]	47.30	16.18	32.48	49.63		29.79	26.59	59.89
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.06	13.40	20.70	25.53		6.87	4.32	17.05
50th-Percentile Queue Length [ft/ln]	26.50	334.96	517.51	638.35		171.79	107.90	426.14
95th-Percentile Queue Length [veh/ln]	1.91	19.40	28.16	33.82		11.17	7.72	23.82
95th-Percentile Queue Length [ft/ln]	47.70	485.04	704.05	845.53		279.26	193.08	595.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.30	16.18	0.00	0.00	32.99	49.63	0.00	0.00	0.00	29.79	26.59	59.89
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	17.17			38.19			0.00			40.94		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	30.39											
Intersection LOS	C											
Intersection V/C	0.939											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.397	2.468
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	1000	0	640
d_b, Bicycle Delay [s]	8.00	12.50	50.00	23.12
I_b,int, Bicycle LOS Score for Intersection	3.024	3.029	4.132	2.682
Bicycle LOS	C	C	D	B

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	41.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.017

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	382	0	0	383	105	0	0	0	46	195	213
Total Analysis Volume [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	50	0	0	40	0	0	0	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	46	36	36		46	46	46
g / C, Green / Cycle	0.06	0.46	0.36	0.36		0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.34	0.36		0.27	0.25	0.47
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2629	1369	649		826	872	826
d1, Uniform Delay [s]	46.96	19.84	31.12	31.99		20.13	19.51	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.16	0.12	0.49
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.95	15.06	36.14		1.02	0.60	38.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.58	0.95	1.00		0.59	0.54	1.03
d, Delay for Lane Group [s/veh]	89.94	20.78	46.18	68.13		21.16	20.11	65.72
Lane Group LOS	F	C	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	8.66	17.60	21.61		8.42	7.80	27.38
50th-Percentile Queue Length [ft/ln]	100.53	216.44	439.94	540.18		210.41	194.92	684.48
95th-Percentile Queue Length [veh/ln]	7.24	13.48	24.48	29.30		13.17	12.38	36.78
95th-Percentile Queue Length [ft/ln]	180.95	337.08	611.93	732.46		329.36	309.40	919.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	20.78	0.00	0.00	49.47	68.13	0.00	0.00	0.00	21.16	20.52	65.72
Movement LOS	F	C			D	E				C	C	F
d_A, Approach Delay [s/veh]	25.46			53.49			0.00			41.76		
Approach LOS	C			D			A			D		
d_I, Intersection Delay [s/veh]	41.05											
Intersection LOS	D											
Intersection V/C	1.017											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.359			2.535		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	920			720			0			920		
d_b, Bicycle Delay [s]	14.58			20.48			50.00			14.58		
I_b,int, Bicycle LOS Score for Intersection	2.462			2.633			4.132			3.056		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	429	59	114	443	0	254	93	40	0	0	0
Total Analysis Volume [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	21	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	15	58	34	34	34	
g / C, Green / Cycle	0.39	0.39	0.15	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.30	0.13	0.13	0.31	0.29	0.19	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2237	706	527	3323	1179	640	606	
d1, Uniform Delay [s]	26.41	21.23	41.46	12.61	30.96	27.30	24.14	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.59	1.26	4.29	0.62	1.98	0.83	0.23	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.77	0.33	0.86	0.53	0.86	0.58	0.27	
d, Delay for Lane Group [s/veh]	29.00	22.49	45.75	13.23	32.94	28.13	24.38	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	11.99	4.03	5.72	7.64	11.43	7.29	2.79	
50th-Percentile Queue Length [ft/ln]	299.83	100.72	142.94	190.96	285.70	182.14	69.65	
95th-Percentile Queue Length [veh/ln]	17.67	7.25	9.64	12.17	16.97	11.71	5.01	
95th-Percentile Queue Length [ft/ln]	441.82	181.30	240.98	304.27	424.30	292.80	125.36	

**Movement, Approach, & Intersection Results**

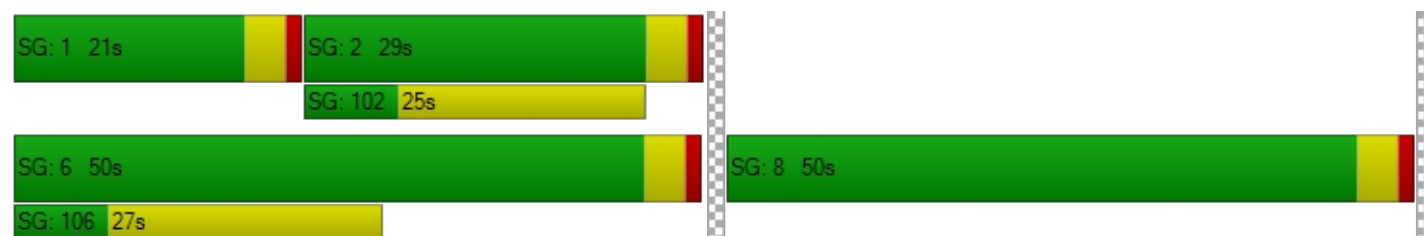
d_M, Delay for Movement [s/veh]	0.00	29.00	22.49	45.75	13.23	0.00	32.94	28.13	24.38	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	28.22			19.86			30.90			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.69											
Intersection LOS	C											
Intersection V/C	0.819											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.513			2.236		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			920			920			0		
d_b, Bicycle Delay [s]	28.13			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.633			2.783			4.111			4.132		
Bicycle LOS	B			C			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	308	58	148	272	0	101	153	16	0	0	0
Total Analysis Volume [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	19	60	32	32	32	
g / C, Green / Cycle	0.37	0.37	0.19	0.60	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.27	0.17	0.29	0.28	0.27	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1424	674	665	2298	568	599	568	
d1, Uniform Delay [s]	26.30	26.82	39.46	10.95	32.62	31.94	24.29	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.70	6.62	4.25	0.70	7.19	4.09	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.68	0.72	0.89	0.47	0.89	0.84	0.11	
d, Delay for Lane Group [s/veh]	29.00	33.43	43.71	11.66	39.81	36.03	24.38	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	10.04	10.93	7.35	6.40	12.50	11.80	1.07	
50th-Percentile Queue Length [ft/ln]	250.88	273.18	183.85	160.12	312.61	294.88	26.67	
95th-Percentile Queue Length [veh/ln]	15.23	16.35	11.80	10.56	18.30	17.43	1.92	
95th-Percentile Queue Length [ft/ln]	380.77	408.71	295.03	263.88	457.59	435.69	48.01	

**Movement, Approach, & Intersection Results**

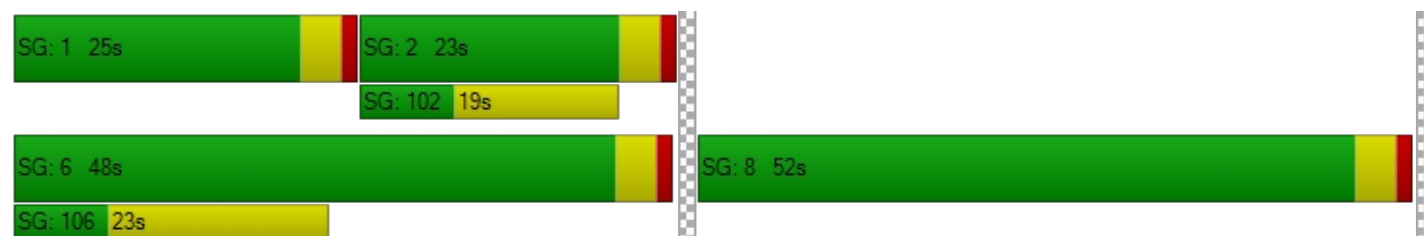
d_M, Delay for Movement [s/veh]	0.00	29.93	33.43	43.71	11.66	0.00	39.81	36.67	24.38	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	30.48			22.92			37.12			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.16											
Intersection LOS	C											
Intersection V/C	0.819											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.294			2.417		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.364			2.945			2.446			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.172

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	89	574	115	29	765
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	89	574	115	29	765
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	22	144	29	7	191
Total Analysis Volume [veh/h]	0	89	574	115	29	765
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.17	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	0.00	13.38	0.00	0.00	9.11	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.61	0.00	0.00	0.10	0.00
95th-Percentile Queue Length [ft/ln]	0.00	15.37	0.00	0.00	2.48	0.00
d_A, Approach Delay [s/veh]	13.38		0.00		0.33	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.93					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	1133	234	84	709	0	48	0	57	340	0	77
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1133	234	84	709	0	48	0	57	340	0	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	283	59	21	177	0	12	0	14	85	0	19
Total Analysis Volume [veh/h]	0	1133	234	84	709	0	48	0	57	340	0	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	51	0	10	61	0	0	49	0	49	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	69	69	79	79	23	23	23	23
g / C, Green / Cycle	0.63	0.63	0.72	0.72	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.36	0.38	0.05	0.19	0.03	0.03	0.19	0.04
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1199	1136	971	2731	408	408	362	375
d1, Uniform Delay [s]	11.69	12.07	4.56	5.35	35.38	35.57	42.46	35.98
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.97	2.36	0.04	0.23	0.13	0.15	11.67	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.57	0.60	0.09	0.26	0.12	0.14	0.94	0.21
d, Delay for Lane Group [s/veh]	13.66	14.43	4.60	5.58	35.51	35.72	54.13	36.24
Lane Group LOS	B	B	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.60	9.97	0.51	2.58	1.06	1.27	10.10	1.74
50th-Percentile Queue Length [ft/ln]	239.94	249.37	12.84	64.43	26.61	31.77	252.46	43.52
95th-Percentile Queue Length [veh/ln]	14.68	15.15	0.92	4.64	1.92	2.29	15.31	3.13
95th-Percentile Queue Length [ft/ln]	366.95	378.86	23.11	115.98	47.90	57.19	382.75	78.33

**Movement, Approach, & Intersection Results**

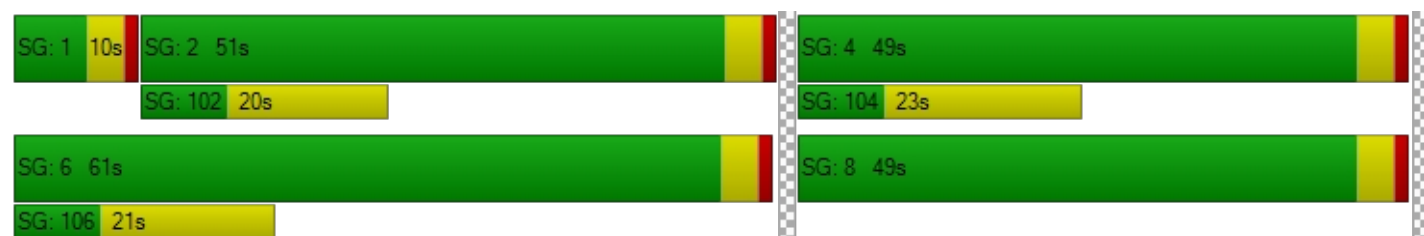
d_M, Delay for Movement [s/veh]	0.00	13.96	14.43	4.60	5.58	0.00	35.51	35.72	35.72	54.13	0.00	36.24
Movement LOS		B	B	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	14.04			5.48			35.62			50.83		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	18.07											
Intersection LOS	B											
Intersection V/C	0.657											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.778			1.776			2.266		
Crosswalk LOS	F			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			1036			818			0		
d_b, Bicycle Delay [s]	18.04			12.77			19.20			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.687			2.214			1.733			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.216

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	171	514	397	8	69	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	171	514	397	8	69	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	129	99	2	17	22
Total Analysis Volume [veh/h]	171	514	397	8	69	88
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.15	0.01	0.00	0.00	0.22	0.14
d_M, Delay for Movement [s/veh]	8.66	0.00	0.00	0.00	20.58	14.85
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.52	0.00	0.00	0.00	1.56	1.56
95th-Percentile Queue Length [ft/ln]	13.00	0.00	0.00	0.00	38.99	38.99
d_A, Approach Delay [s/veh]	2.16		0.00		17.37	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.37					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	678	495	0	7	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	678	495	0	7	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	170	124	0	2	34
Total Analysis Volume [veh/h]	0	678	495	0	7	137
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.02	0.24
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	15.88	13.44
Movement LOS		A	A		C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	25.24	25.24
d_A, Approach Delay [s/veh]	0.00		0.00		13.56	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.48					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	18.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.096

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	668	29	44	652	33	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	668	29	44	652	33	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	167	7	11	163	8	16
Total Analysis Volume [veh/h]	668	29	44	652	33	64
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.05	0.01	0.10	0.14
d_M, Delay for Movement [s/veh]	0.00	0.00	9.21	0.00	18.21	15.75
Movement LOS	A	A	A	A	C	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.15	0.00	0.92	0.92
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.85	0.00	22.92	22.92
d_A, Approach Delay [s/veh]	0.00		0.58		16.59	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.35					
Intersection LOS	C					



**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	22.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	35	985	151	0	802	12	0	0	29	0	0	271
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	985	151	0	802	12	0	0	29	0	0	271
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	246	38	0	201	3	0	0	7	0	0	68
Total Analysis Volume [veh/h]	35	985	151	0	802	12	0	0	29	0	0	271
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.00	0.58
d_M, Delay for Movement [s/veh]	9.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.38	0.00	0.00	22.91
Movement LOS	A	A	A		A	A			B			C
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	3.63
95th-Percentile Queue Length [ft/ln]	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	0.00	0.00	90.71
d_A, Approach Delay [s/veh]	0.29			0.00			11.38			22.91		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	3.01											
Intersection LOS	C											





*APPENDIX G-V*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	42.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	129	855	142	267	1026	217	219	745	166	171	956	254
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	855	142	267	1026	217	219	745	166	171	956	254
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	214	36	67	257	54	55	186	42	43	239	64
Total Analysis Volume [veh/h]	129	855	142	267	1026	217	219	745	166	171	956	254
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	11	43	0	15	45	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	53	53	7	54	54	11	27	27	7	23	23
g / C, Green / Cycle	0.05	0.48	0.48	0.06	0.49	0.49	0.10	0.25	0.25	0.07	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.15	0.08	0.08	0.22	0.22	0.12	0.16	0.16	0.05	0.17	0.14
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	188	2737	864	223	1863	883	177	928	440	232	1211	382
d1, Uniform Delay [s]	51.15	17.49	16.14	51.50	18.34	18.41	49.61	37.49	37.59	50.42	41.00	39.73
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.39	0.30	0.41	97.46	0.79	1.70	118.12	0.82	1.79	4.53	1.19	1.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.31	0.16	1.20	0.45	0.46	1.24	0.66	0.67	0.74	0.79	0.66
d, Delay for Lane Group [s/veh]	55.54	17.78	16.55	148.96	19.14	20.11	167.74	38.31	39.38	54.95	42.20	41.72
Lane Group LOS	E	B	B	F	B	C	F	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.86	4.44	2.11	6.09	7.06	7.01	10.63	7.52	7.36	2.45	8.25	6.48
50th-Percentile Queue Length [ft/ln]	46.46	111.01	52.63	152.33	176.42	175.37	265.69	187.99	183.88	61.29	206.17	161.94
95th-Percentile Queue Length [veh/ln]	3.34	7.90	3.79	10.68	11.41	11.36	17.25	12.02	11.80	4.41	12.96	10.65
95th-Percentile Queue Length [ft/ln]	83.62	197.41	94.73	266.95	285.34	283.96	431.19	300.42	295.07	110.33	323.91	266.29

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	55.54	17.78	16.55	148.96	19.31	20.11	167.74	38.50	39.38	54.95	42.20	41.72
Movement LOS	E	B	B	F	B	C	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	21.95			42.35			63.68			43.69		
Approach LOS	C			D			E			D		
d_I, Intersection Delay [s/veh]	42.93											
Intersection LOS	D											
Intersection V/C	0.644											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.128			3.081			2.942			3.133		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			745			691		
d_b, Bicycle Delay [s]	23.56			22.91			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.179			2.390			2.181			2.319		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.683

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	8	1188	641	86	1489	24	58	122	11	615	85	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1188	641	86	1489	24	58	122	11	615	85	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	297	160	22	372	6	15	31	3	154	21	0
Total Analysis Volume [veh/h]	8	1188	641	86	1489	24	58	122	11	615	85	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	53	7	59	59	9	9	9	25	25
g / C, Green / Cycle	0.01	0.49	0.06	0.53	0.53	0.08	0.08	0.08	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.00	0.21	0.05	0.32	0.17	0.03	0.06	0.01	0.19	0.20
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	23	2764	111	2027	960	153	162	153	402	402
d1, Uniform Delay [s]	53.88	18.46	50.92	17.62	14.36	47.62	49.24	46.36	41.18	41.28
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.55	0.49	11.05	1.32	0.84	1.54	6.96	0.20	5.74	6.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.43	0.78	0.60	0.31	0.38	0.75	0.07	0.87	0.87
d, Delay for Lane Group [s/veh]	62.43	18.95	61.98	18.94	15.21	49.15	56.20	46.56	46.92	47.38
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.27	6.55	2.67	10.50	4.28	1.57	3.58	0.29	9.65	9.80
50th-Percentile Queue Length [ft/ln]	6.86	163.65	66.79	262.58	106.94	39.24	89.61	7.15	241.37	245.04
95th-Percentile Queue Length [veh/ln]	0.49	10.74	4.81	15.82	7.67	2.83	6.45	0.51	14.75	14.94
95th-Percentile Queue Length [ft/ln]	12.36	268.54	120.22	395.46	191.74	70.63	161.29	12.87	368.77	373.40

**Movement, Approach, & Intersection Results**

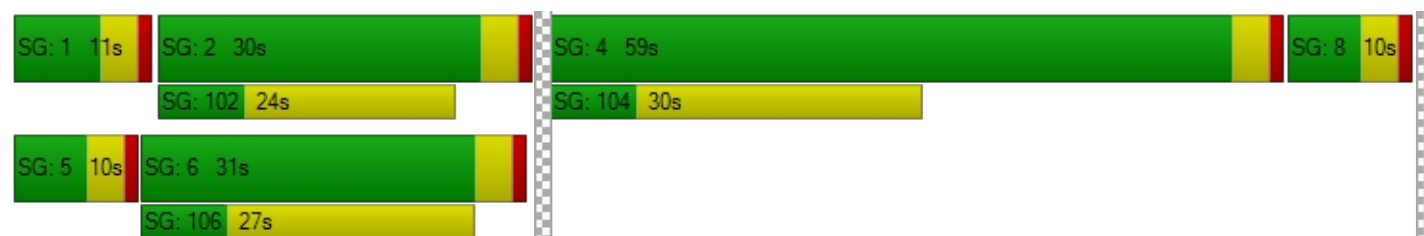
d_M, Delay for Movement [s/veh]	62.43	18.95	0.00	61.98	18.25	15.21	49.15	56.20	46.56	47.12	47.38	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	19.24			20.56			53.51			47.15		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	26.89											
Intersection LOS	C											
Intersection V/C	0.683											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			3.000			2.216			2.245		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			491			109			1000		
d_b, Bicycle Delay [s]	32.07			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.217			2.439			1.875			2.715		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	46	1495	45	307	1795	16	21	96	70	87	118	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	1495	45	307	1795	16	21	96	70	87	118	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	374	11	77	449	4	5	24	18	22	30	91
Total Analysis Volume [veh/h]	46	1495	45	307	1795	16	21	96	70	87	118	362
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	55	0	18	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	63	63	14	72	72	21	21	21	21	21	39
g / C, Green / Cycle	0.04	0.57	0.57	0.13	0.66	0.66	0.19	0.19	0.19	0.19	0.19	0.36
(v / s)_i Volume / Saturation Flow Rate	0.03	0.42	0.41	0.09	0.47	0.01	0.01	0.05	0.04	0.05	0.06	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	77	1086	1029	450	2498	1183	280	362	343	298	362	640
d1, Uniform Delay [s]	51.67	17.31	17.23	45.77	12.24	6.51	36.43	37.92	37.47	37.84	38.39	28.58
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.26
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.12	4.33	4.46	1.84	1.82	0.02	0.11	0.39	0.29	0.54	0.52	1.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.73	0.73	0.68	0.72	0.01	0.08	0.27	0.20	0.29	0.33	0.57
d, Delay for Lane Group [s/veh]	58.79	21.64	21.69	47.60	14.05	6.54	36.55	38.31	37.76	38.37	38.91	30.45
Lane Group LOS	E	C	C	D	B	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.40	15.19	14.29	4.11	13.51	0.13	0.47	2.25	1.62	2.04	2.80	7.95
50th-Percentile Queue Length [ft/ln]	34.95	379.80	357.17	102.80	337.81	3.23	11.81	56.13	40.43	50.98	69.94	198.69
95th-Percentile Queue Length [veh/ln]	2.52	21.58	20.49	7.40	19.54	0.23	0.85	4.04	2.91	3.67	5.04	12.57
95th-Percentile Queue Length [ft/ln]	62.91	539.60	512.15	185.04	488.53	5.81	21.26	101.04	72.77	91.77	125.90	314.27

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.79	21.67	21.69	47.60	14.05	6.54	36.55	38.31	37.76	38.37	38.91	30.45
Movement LOS	E	C	C	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	22.74			18.86			37.91			33.43		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	22.89											
Intersection LOS	C											
Intersection V/C	0.760											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.123			3.190			2.230			2.507		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			1073			600			600		
d_b, Bicycle Delay [s]	15.82			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.868			3.307			1.868			2.495		
Bicycle LOS	C			C			A			B		

**Sequence**



Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	261	296	156	92	214	24	21	337	158	108	323	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	261	296	156	92	214	24	21	337	158	108	323	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	74	39	23	54	6	5	84	40	27	81	36
Total Analysis Volume [veh/h]	261	296	156	92	214	24	21	337	158	108	323	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	30	0	0	49	49	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	38	38	38	38	22	22	64	22	22	22
g / C, Green / Cycle	0.35	0.35	0.35	0.35	0.35	0.20	0.20	0.58	0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.09	0.05	0.13	0.01	0.18	0.09	0.06	0.13	0.12
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	623	623	623	623	623	192	378	1046	100	378	358
d1, Uniform Delay [s]	27.46	28.09	25.70	24.74	27.05	35.65	42.83	10.55	37.31	40.57	40.03
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.19	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.07	2.59	0.96	0.50	1.78	0.25	12.19	0.31	63.26	1.99	1.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.42	0.48	0.25	0.15	0.38	0.11	0.89	0.15	1.07	0.66	0.60
d, Delay for Lane Group [s/veh]	29.52	30.68	26.66	25.24	28.83	35.90	55.02	10.86	100.57	42.56	41.67
Lane Group LOS	C	C	C	C	C	D	E	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	5.57	6.50	3.08	1.74	4.99	0.47	10.11	1.80	4.06	6.42	5.45
50th-Percentile Queue Length [ft/ln]	139.28	162.45	77.09	43.56	124.78	11.79	252.84	45.08	101.52	160.49	136.36
95th-Percentile Queue Length [veh/ln]	9.44	10.68	5.55	3.14	8.66	0.85	15.33	3.25	7.31	10.58	9.28
95th-Percentile Queue Length [ft/ln]	236.06	266.97	138.76	78.41	216.38	21.22	383.23	81.14	182.74	264.38	232.11

**Movement, Approach, & Intersection Results**

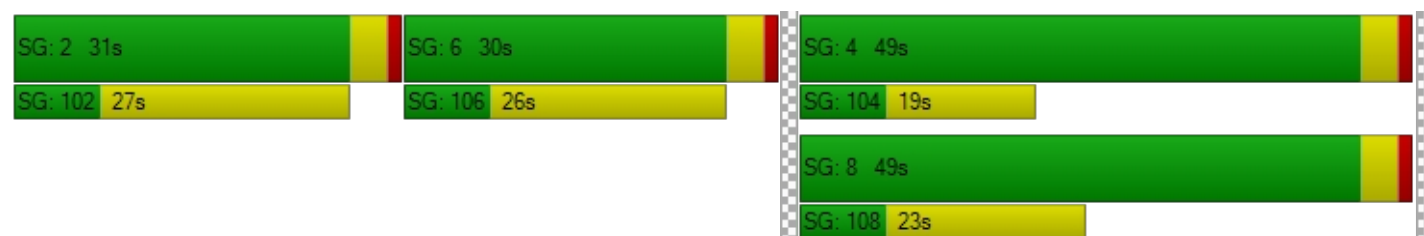
d_M, Delay for Movement [s/veh]	29.52	30.68	26.66	25.24	28.83	28.83	35.90	55.02	10.86	100.57	42.36	41.67
Movement LOS	C	C	C	C	C	C	D	E	B	F	D	D
d_A, Approach Delay [s/veh]	29.38			27.83			40.72			53.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	38.28											
Intersection LOS	D											
Intersection V/C	0.532											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.585			2.236			2.529			2.423		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			818			818		
d_b, Bicycle Delay [s]	31.31			32.07			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.736			2.104			2.411			2.033		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	16	148	82	335	705	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	148	82	335	705	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	37	21	84	176	7
Total Analysis Volume [veh/h]	16	148	82	335	705	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	73	0	0	37	37	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	91	91	91	91
g / C, Green / Cycle	0.10	0.10	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.08	0.05	0.18	0.37	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	183	183	1318	1569	1569	1486
d1, Uniform Delay [s]	44.72	48.29	1.75	2.03	2.66	1.70
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	8.22	0.09	0.31	0.93	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.81	0.06	0.21	0.45	0.02
d, Delay for Lane Group [s/veh]	44.92	56.51	1.84	2.34	3.59	1.72
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.41	4.38	0.24	1.13	3.15	0.08
50th-Percentile Queue Length [ft/ln]	10.16	109.38	6.08	28.25	78.68	2.05
95th-Percentile Queue Length [veh/ln]	0.73	7.81	0.44	2.03	5.66	0.15
95th-Percentile Queue Length [ft/ln]	18.29	195.14	10.94	50.85	141.62	3.69

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	44.92	56.51	1.84	2.34	3.59	1.72
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.38		2.24		3.52	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	9.58					
Intersection LOS	A					
Intersection V/C	0.489					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.156	2.363	2.302
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.820	5.344
Bicycle LOS	D	E	F

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 73s

SG: 101 26s

SG: 4 37s

SG: 104 21s

SG: 8 37s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	21.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	86	1206	108	120	1132	54	71	289	98	63	263	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	1206	108	120	1132	54	71	289	98	63	263	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	302	27	30	283	14	18	72	25	16	66	19
Total Analysis Volume [veh/h]	86	1206	108	120	1132	54	71	289	98	63	263	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	30	0	10	29	0	11	60	0	10	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	78	68	68	78	69	69	24	15	15	24	14	14
g / C, Green / Cycle	0.71	0.62	0.62	0.71	0.62	0.62	0.22	0.13	0.13	0.22	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.05	0.36	0.35	0.07	0.32	0.32	0.04	0.11	0.10	0.04	0.09	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1029	1177	1116	968	1182	1120	332	254	240	304	250	237
d1, Uniform Delay [s]	4.86	12.42	12.26	4.96	11.60	11.52	35.11	46.34	45.99	34.95	45.78	45.54
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	2.09	2.08	0.06	1.63	1.67	0.32	6.07	4.84	0.33	3.68	3.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.58	0.57	0.12	0.52	0.51	0.21	0.81	0.76	0.21	0.71	0.67
d, Delay for Lane Group [s/veh]	5.02	14.51	14.34	5.02	13.23	13.19	35.43	52.42	50.82	35.28	49.46	48.84
Lane Group LOS	A	B	B	A	B	B	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.58	9.96	9.11	0.78	8.35	7.77	1.59	5.86	5.10	1.40	4.89	4.36
50th-Percentile Queue Length [ft/ln]	14.59	248.99	227.81	19.53	208.79	194.18	39.66	146.45	127.51	35.08	122.20	109.03
95th-Percentile Queue Length [veh/ln]	1.05	15.14	14.06	1.41	13.09	12.34	2.86	9.83	8.80	2.53	8.51	7.79
95th-Percentile Queue Length [ft/ln]	26.27	378.39	351.57	35.16	327.28	308.44	71.39	245.68	220.11	63.15	212.84	194.65

**Movement, Approach, & Intersection Results**

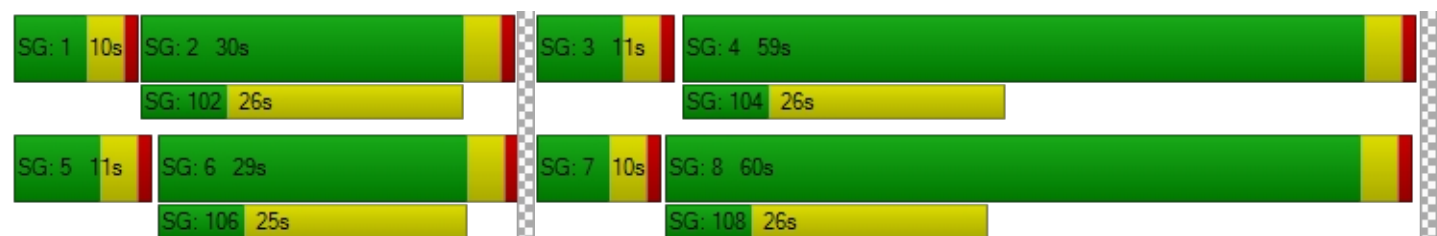
d_M, Delay for Movement [s/veh]	5.02	14.44	14.34	5.02	13.21	13.19	35.43	51.95	50.82	35.28	49.26	48.84
Movement LOS	A	B	B	A	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	13.85			12.46			49.15			46.98		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.60											
Intersection LOS	C											
Intersection V/C	0.610											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.848			2.843			2.556			2.597		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			455			1018			1000		
d_b, Bicycle Delay [s]	32.07			32.84			13.25			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.715			2.637			1.937			1.890		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	46.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.012

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	154	1226	324	173	1250	176	183	840	159	286	795	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	1226	324	173	1250	176	183	840	159	286	795	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	307	81	43	313	44	46	210	40	72	199	41
Total Analysis Volume [veh/h]	154	1226	324	173	1250	176	183	840	159	286	795	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	51	0	12	53	0	13	35	0	12	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	59	48	48	59	49	49	43	31	31	43	30	30
g / C, Green / Cycle	0.54	0.43	0.43	0.54	0.45	0.45	0.39	0.28	0.28	0.39	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.43	0.41	0.10	0.39	0.38	0.10	0.28	0.26	0.16	0.21	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	435	825	781	321	848	803	447	534	505	303	1033	489
d1, Uniform Delay [s]	12.88	30.67	29.95	13.03	27.65	27.20	22.79	39.36	38.57	24.34	36.89	32.12
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.44	0.40	0.14	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.25	26.96	21.87	1.40	12.16	11.05	0.60	33.59	22.92	17.27	1.25	0.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.35	0.98	0.95	0.54	0.87	0.85	0.41	0.99	0.93	0.94	0.77	0.34
d, Delay for Lane Group [s/veh]	15.12	57.63	51.82	14.43	39.82	38.25	23.39	72.95	61.49	41.61	38.14	32.52
Lane Group LOS	B	E	D	B	D	D	C	E	E	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.17	26.49	22.93	2.28	19.95	17.98	3.28	18.88	15.43	6.81	9.91	3.57
50th-Percentile Queue Length [ft/ln]	54.23	662.31	573.24	57.04	498.78	449.38	82.04	472.03	385.81	170.14	247.69	89.27
95th-Percentile Queue Length [veh/ln]	3.90	34.93	30.78	4.11	27.28	24.93	5.91	26.01	21.88	11.08	15.07	6.43
95th-Percentile Queue Length [ft/ln]	97.61	873.34	769.57	102.68	681.91	623.21	147.68	650.19	546.88	277.10	376.74	160.68

**Movement, Approach, & Intersection Results**

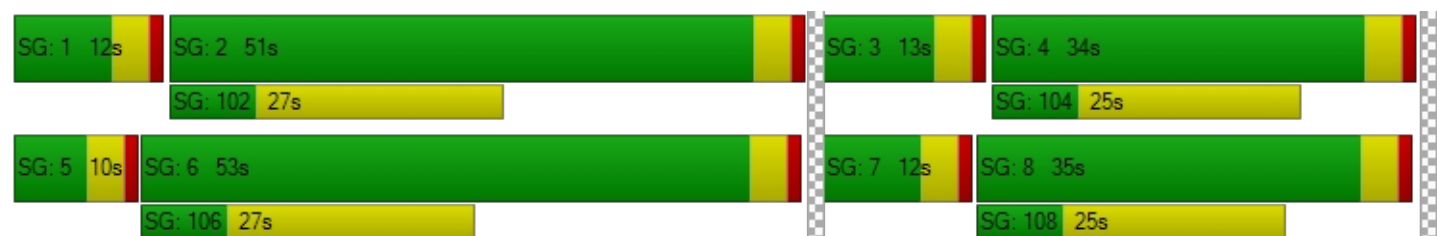
d_M, Delay for Movement [s/veh]	15.12	55.65	51.82	14.43	39.18	38.25	23.39	68.68	61.49	41.61	38.14	32.52
Movement LOS	B	E	D	B	D	D	C	E	E	D	D	C
d_A, Approach Delay [s/veh]	51.26			36.40			60.70			38.19		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	46.22											
Intersection LOS	D											
Intersection V/C	1.012											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.100			3.004			2.861			2.993		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			891			564			545		
d_b, Bicycle Delay [s]	18.04			16.91			28.37			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.965			2.879			2.535			2.588		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	136	474	286	47	486	137	330	933	140	279	965	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	136	474	286	47	486	137	330	933	140	279	965	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	119	72	12	122	34	83	233	35	70	241	29
Total Analysis Volume [veh/h]	136	474	286	47	486	137	330	933	140	279	965	117
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	32	0	10	29	0	35	54	0	14	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	36	36	44	33	33	22	44	44	10	31	31
g / C, Green / Cycle	0.40	0.33	0.33	0.40	0.30	0.30	0.20	0.40	0.40	0.09	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.16	0.03	0.17	0.16	0.18	0.30	0.28	0.08	0.25	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	550	1234	584	644	570	540	365	752	713	320	1081	512
d1, Uniform Delay [s]	21.19	28.69	29.85	20.11	32.69	32.22	42.82	28.51	28.07	49.37	37.78	30.15
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.20	0.21	0.19	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.07	0.91	2.92	0.05	4.29	3.86	13.66	2.85	2.39	7.28	2.83	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.25	0.38	0.49	0.07	0.58	0.54	0.90	0.75	0.72	0.87	0.89	0.23
d, Delay for Lane Group [s/veh]	22.26	29.59	32.77	20.16	36.98	36.07	56.48	31.36	30.46	56.64	40.61	30.37
Lane Group LOS	C	C	C	C	D	D	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.42	4.96	6.50	0.75	8.10	7.02	10.07	13.01	11.62	4.10	12.71	2.41
50th-Percentile Queue Length [ft/ln]	60.50	123.95	162.60	18.72	202.38	175.51	251.74	325.20	290.46	102.44	317.72	60.22
95th-Percentile Queue Length [veh/ln]	4.36	8.61	10.69	1.35	12.76	11.37	15.27	18.92	17.21	7.38	18.56	4.34
95th-Percentile Queue Length [ft/ln]	108.91	215.24	267.16	33.69	319.03	284.15	381.85	473.08	430.22	184.40	463.88	108.39

**Movement, Approach, & Intersection Results**

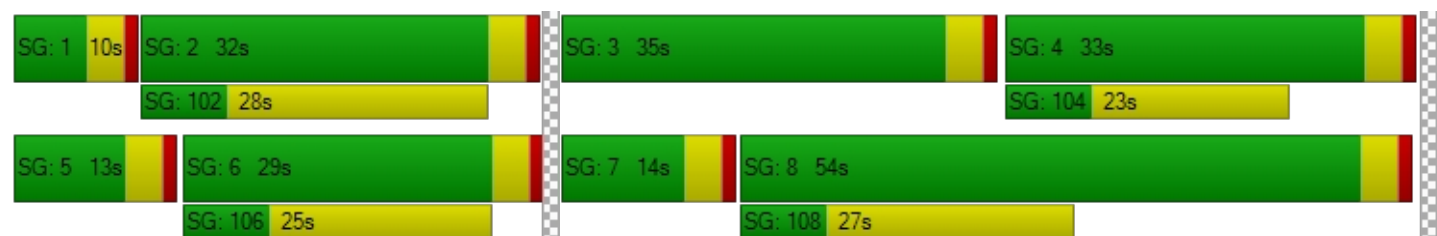
d_M, Delay for Movement [s/veh]	22.26	29.59	32.77	20.16	36.69	36.07	56.48	31.00	30.46	56.64	40.61	30.37
Movement LOS	C	C	C	C	D	D	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	29.49			35.40			36.94			43.02		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	37.07											
Intersection LOS	D											
Intersection V/C	0.776											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.755			2.620			2.886			2.992		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			455			909			527		
d_b, Bicycle Delay [s]	30.56			32.84			16.36			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.299			2.112			2.717			2.682		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	14.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	13	23	26	291	20	94	271	1018	7	23	1287	652
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	23	26	291	20	94	271	1018	7	23	1287	652
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	6	7	73	5	24	68	255	2	6	322	163
Total Analysis Volume [veh/h]	13	23	26	291	20	94	271	1018	7	23	1287	652
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	11	0	20	31	0	10	79	0	0	69	69
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	16	25	77	77	77	65	65	85
g / C, Green / Cycle	0.05	0.05	0.05	0.15	0.23	0.70	0.70	0.70	0.59	0.59	0.77
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.08	0.06	0.15	0.28	0.28	0.01	0.34	0.36
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	88	83	508	410	986	1329	1259	894	2250	1392
d1, Uniform Delay [s]	50.39	50.64	50.76	43.85	35.01	5.85	6.88	6.87	9.27	13.84	4.42
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.12	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.46	1.55	2.09	1.02	0.36	0.17	0.89	0.93	0.05	1.06	1.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.20	0.26	0.31	0.57	0.28	0.27	0.40	0.40	0.03	0.57	0.47
d, Delay for Lane Group [s/veh]	51.85	52.19	52.85	44.87	35.38	6.02	7.77	7.81	9.33	14.91	5.56
Lane Group LOS	D	D	D	D	D	A	A	A	A	B	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.37	0.65	0.74	3.76	2.56	2.06	4.93	4.67	0.24	9.67	4.57
50th-Percentile Queue Length [ft/ln]	9.26	16.23	18.53	93.98	64.04	51.45	123.14	116.73	5.92	241.72	114.29
95th-Percentile Queue Length [veh/ln]	0.67	1.17	1.33	6.77	4.61	3.70	8.57	8.21	0.43	14.77	8.08
95th-Percentile Queue Length [ft/ln]	16.67	29.22	33.36	169.16	115.27	92.62	214.14	205.32	10.65	369.20	201.95

**Movement, Approach, & Intersection Results**

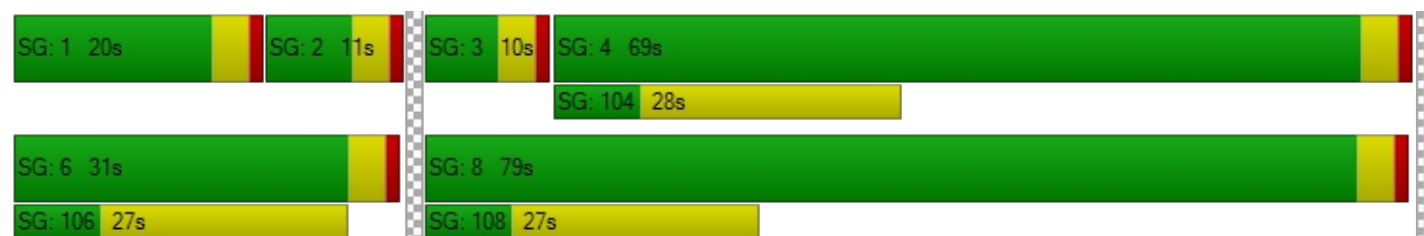
d_M, Delay for Movement [s/veh]	51.85	52.19	52.85	44.87	35.38	35.38	6.02	7.79	7.81	9.33	14.91	5.56
Movement LOS	D	D	D	D	D	D	A	A	A	A	B	A
d_A, Approach Delay [s/veh]	52.40			42.19			7.42			11.73		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	14.22											
Intersection LOS	B											
Intersection V/C	0.556											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.201			2.705			2.852			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	127			491			1364			1182		
d_b, Bicycle Delay [s]	48.22			31.31			5.57			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.662			2.228			2.629			3.178		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	237	114	180	124	183	77	57	1155	117	201	1707	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	237	114	180	124	183	77	57	1155	117	201	1707	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	29	45	31	46	19	14	289	29	50	427	14
Total Analysis Volume [veh/h]	237	114	180	124	183	77	57	1155	117	201	1707	54
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	34	0	10	30	0	10	52	0	14	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	15	15	25	11	11	77	67	67	77	68	68
g / C, Green / Cycle	0.22	0.13	0.13	0.22	0.10	0.10	0.70	0.61	0.61	0.70	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.13	0.06	0.10	0.07	0.07	0.07	0.03	0.35	0.34	0.11	0.48	0.48
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	376	252	239	403	183	174	730	1153	1093	972	1181	1119
d1, Uniform Delay [s]	38.16	44.03	45.98	35.58	48.44	48.19	5.00	13.05	12.85	5.45	15.04	15.04
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.74	1.27	4.77	0.43	6.12	5.10	0.05	2.08	2.06	0.48	4.77	5.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.63	0.45	0.75	0.31	0.75	0.70	0.08	0.57	0.56	0.21	0.77	0.77
d, Delay for Lane Group [s/veh]	39.89	45.29	50.75	36.01	54.55	53.29	5.05	15.13	14.91	5.94	19.80	20.06
Lane Group LOS	D	D	D	D	D	D	A	B	B	A	B	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.87	2.95	5.04	2.82	3.99	3.49	0.37	9.93	9.02	1.53	16.52	15.73
50th-Percentile Queue Length [ft/ln]	146.75	73.84	126.03	70.58	99.75	87.13	9.32	248.18	225.47	38.19	413.03	393.26
95th-Percentile Queue Length [veh/ln]	9.84	5.32	8.72	5.08	7.18	6.27	0.67	15.09	13.94	2.75	23.19	22.23
95th-Percentile Queue Length [ft/ln]	246.08	132.92	218.08	127.04	179.56	156.83	16.77	377.36	348.60	68.75	579.68	555.87

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	39.89	45.29	50.75	36.01	54.24	53.29	5.05	15.03	14.91	5.94	19.92	20.06
Movement LOS	D	D	D	D	D	D	A	B	B	A	B	C
d_A, Approach Delay [s/veh]	44.73			48.16			14.59			18.49		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.28											
Intersection LOS	C											
Intersection V/C	0.792											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.690			2.341			3.001			3.003		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			473			873			945		
d_b, Bicycle Delay [s]	29.09			32.07			17.47			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.436			1.876			2.656			3.178		
Bicycle LOS	B			A			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	58	42	86	30	23	35	27	1350	50	54	1841	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	58	42	86	30	23	35	27	1350	50	54	1841	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	11	22	8	6	9	7	338	13	14	460	12
Total Analysis Volume [veh/h]	58	42	86	30	23	35	27	1350	50	54	1841	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	8	8	8	8	8	94	86	86	94	87	87
g / C, Green / Cycle	0.07	0.07	0.07	0.07	0.07	0.86	0.78	0.78	0.86	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.05	0.02	0.03	0.02	0.38	0.38	0.03	0.51	0.51
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	106	131	124	123	124	1218	1477	1399	1372	1502	1423
d1, Uniform Delay [s]	49.27	48.76	50.08	48.49	49.27	1.12	4.40	4.38	1.13	4.93	4.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.39	1.41	6.83	1.01	2.74	0.01	1.16	1.20	0.05	2.16	2.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.32	0.70	0.24	0.47	0.02	0.49	0.48	0.04	0.65	0.65
d, Delay for Lane Group [s/veh]	53.66	50.17	56.90	49.51	52.02	1.12	5.57	5.58	1.19	7.09	7.21
Lane Group LOS	D	D	E	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.66	1.15	2.54	0.81	1.63	0.04	5.02	4.71	0.10	7.83	7.46
50th-Percentile Queue Length [ft/ln]	41.54	28.73	63.61	20.37	40.67	1.04	125.61	117.65	2.50	195.71	186.56
95th-Percentile Queue Length [veh/ln]	2.99	2.07	4.58	1.47	2.93	0.07	8.70	8.26	0.18	12.42	11.94
95th-Percentile Queue Length [ft/ln]	74.76	51.72	114.50	36.67	73.21	1.87	217.51	206.59	4.51	310.42	298.57

**Movement, Approach, & Intersection Results**

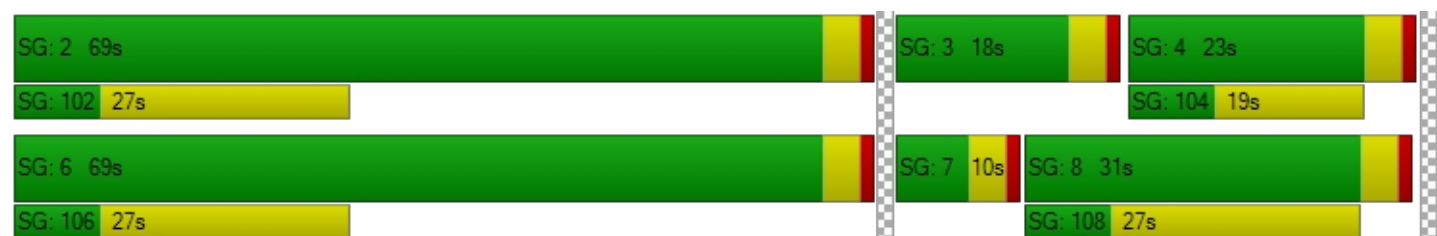
d_M, Delay for Movement [s/veh]	53.66	50.17	56.90	49.51	52.02	52.02	1.12	5.57	5.58	1.19	7.14	7.21
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	54.37			51.16			5.49			6.98		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	9.88											
Intersection LOS	A											
Intersection V/C	0.630											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.278			2.048			3.047			3.017		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.867			1.705			2.737			3.163		
Bicycle LOS	A			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	66.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.932

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	102	52	38	94	82	79	301	24	100	367	34
Total Analysis Volume [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	35	0	15	37	37	13	35	0	25	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	35	35	7	33	46	9	31	31	21	43	43
g / C, Green / Cycle	0.08	0.32	0.32	0.06	0.30	0.42	0.08	0.28	0.28	0.19	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.09	0.11	0.12	0.04	0.10	0.18	0.09	0.32	0.05	0.22	0.39	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	148	1221	578	217	1145	756	288	1065	504	344	1478	700
d1, Uniform Delay [s]	50.50	28.38	28.67	50.61	29.80	22.62	50.50	39.61	30.08	44.52	33.46	22.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.20	0.11	0.13	0.11	0.32	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	80.98	0.74	1.75	4.12	0.76	0.74	57.73	62.87	0.18	92.33	9.26	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.14	0.33	0.36	0.70	0.33	0.43	1.10	1.13	0.19	1.16	0.99	0.19
d, Delay for Lane Group [s/veh]	131.49	29.12	30.42	54.74	30.56	23.36	108.24	102.48	30.26	136.85	42.72	22.32
Lane Group LOS	F	C	C	D	C	C	F	F	C	F	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.38	4.20	4.51	2.19	3.96	6.07	6.25	23.42	1.92	18.10	20.73	2.31
50th-Percentile Queue Length [ft/ln]	184.55	104.96	112.69	54.68	98.89	151.87	156.22	585.46	47.96	452.45	518.32	57.69
95th-Percentile Queue Length [veh/ln]	12.38	7.56	7.99	3.94	7.12	10.12	10.69	33.77	3.45	27.05	28.20	4.15
95th-Percentile Queue Length [ft/ln]	309.53	188.93	199.74	98.43	178.00	252.92	267.27	844.13	86.32	676.26	705.01	103.84

**Movement, Approach, & Intersection Results**

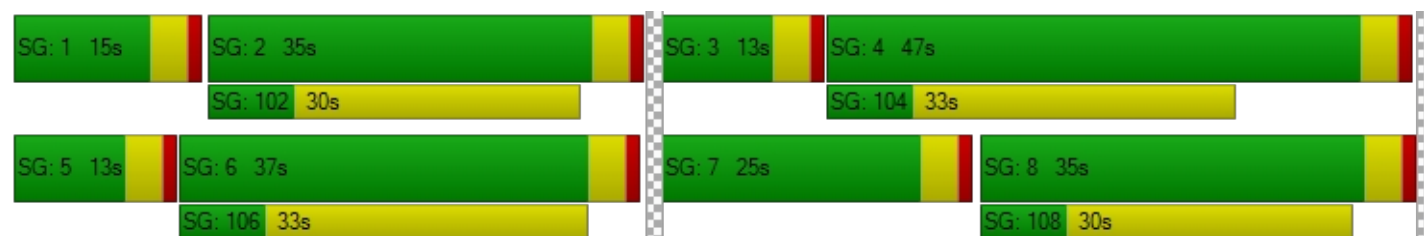
d_M, Delay for Movement [s/veh]	131.49	29.12	30.42	54.74	30.56	23.36	108.24	102.48	30.26	136.85	42.72	22.32
Movement LOS	F	C	C	D	C	C	F	F	C	F	D	C
d_A, Approach Delay [s/veh]	51.51			32.14			99.41			60.17		
Approach LOS	D			C			F			E		
d_I, Intersection Delay [s/veh]	66.39											
Intersection LOS	E											
Intersection V/C	0.932											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.731			2.842			3.102			3.042		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			600			564			782		
d_b, Bicycle Delay [s]	28.37			26.95			28.37			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.207			2.263			2.893			3.210		
Bicycle LOS	B			B			C			C		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.955

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	9	96	0	289	179	108	403	0
Total Analysis Volume [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	29	0	0	49	0	32	81	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		25	25	45	45	28	77
g / C, Green / Cycle		0.23	0.23	0.41	0.41	0.25	0.70
(v / s)_i Volume / Saturation Flow Rate		0.08	0.21	0.30	0.40	0.24	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		409	409	1557	737	458	2661
d1, Uniform Delay [s]		35.52	41.74	27.55	31.79	40.27	8.58
k, delay calibration		0.11	0.29	0.50	0.50	0.36	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.47	21.60	3.26	26.51	24.86	1.03
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.33	0.94	0.74	0.97	0.95	0.61
d, Delay for Lane Group [s/veh]		35.99	63.34	30.81	58.30	65.12	9.61
Lane Group LOS		D	E	C	E	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.08	12.54	13.31	23.41	14.50	9.16
50th-Percentile Queue Length [ft/ln]		76.97	313.44	332.74	585.20	362.60	228.88
95th-Percentile Queue Length [veh/ln]		5.54	18.34	19.29	31.34	20.75	14.12
95th-Percentile Queue Length [ft/ln]		138.54	458.61	482.32	783.57	518.75	352.93

**Movement, Approach, & Intersection Results**

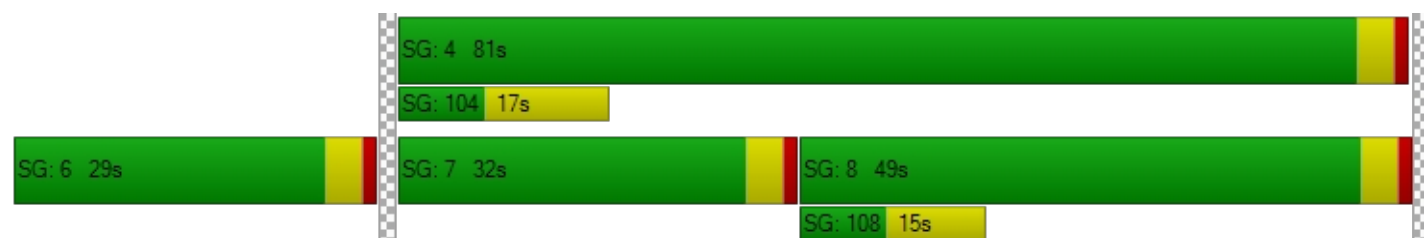
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	35.99	35.99	63.34	0.00	30.81	58.30	65.12	9.61	0.00
Movement LOS				D	D	E		C	E	E	A	
d_A, Approach Delay [s/veh]	0.00			56.21			41.31			21.37		
Approach LOS	A			E			D			C		
d_I, Intersection Delay [s/veh]	33.86											
Intersection LOS	C											
Intersection V/C	0.955											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.585	1.977	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	455	818	1400
d_b, Bicycle Delay [s]	55.00	32.84	19.20	4.95
I_b,int, Bicycle LOS Score for Intersection	4.132	2.414	2.589	3.246
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	44.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.937

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	193	0	109	0	0	0	106	224	0	0	299	39
Total Analysis Volume [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	30	0	0	0	0	0	31	80	0	0	49	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26		28	76	44	44
g / C, Green / Cycle	0.24	0.24	0.24		0.26	0.69	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.22	0.22	0.22		0.24	0.24	0.36	0.38
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	426	426	426		462	2625	756	716
d1, Uniform Delay [s]	41.30	41.30	41.30		39.74	6.88	30.96	31.94
k, delay calibration	0.32	0.32	0.32		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.00	24.00	24.00		7.77	0.35	15.28	22.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.95	0.95	0.95		0.92	0.34	0.89	0.94
d, Delay for Lane Group [s/veh]	65.30	65.30	65.30		47.51	7.23	46.23	54.39
Lane Group LOS	E	E	E		D	A	D	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	13.45	13.45	13.45		11.99	3.97	19.49	21.26
50th-Percentile Queue Length [ft/ln]	336.34	336.34	336.34		299.79	99.24	487.21	531.56
95th-Percentile Queue Length [veh/ln]	19.47	19.47	19.47		17.67	7.15	26.73	28.82
95th-Percentile Queue Length [ft/ln]	486.72	486.72	486.72		441.77	178.63	668.20	720.61

**Movement, Approach, & Intersection Results**

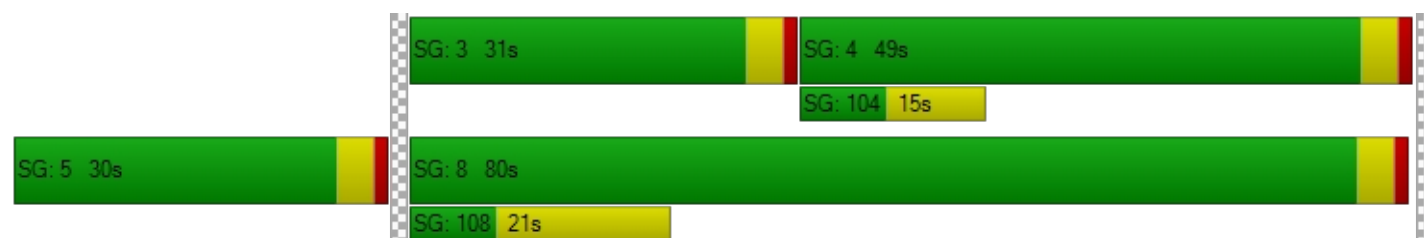
d_M, Delay for Movement [s/veh]	65.30	0.00	65.30	0.00	0.00	0.00	47.51	7.23	0.00	0.00	49.78	54.39
Movement LOS	E		E				D	A			D	D
d_A, Approach Delay [s/veh]	65.30			0.00			20.18			50.31		
Approach LOS	E			A			C			D		
d_I, Intersection Delay [s/veh]	44.74											
Intersection LOS	D											
Intersection V/C	0.937											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.343	1.998	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1382	818
d_b, Bicycle Delay [s]	55.00	55.00	5.25	19.20
I_b,int, Bicycle LOS Score for Intersection	6.127	4.132	2.648	2.675
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.343

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	33	966	29	20	928	20	15	20	34	34	18	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	966	29	20	928	20	15	20	34	34	18	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	242	7	5	232	5	4	5	9	9	5	9
Total Analysis Volume [veh/h]	33	966	29	20	928	20	15	20	34	34	18	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.02	0.27	0.27	0.01	0.26	0.26	0.04	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1486	1644	1557	1481	1644	1557	152	158
d1, Uniform Delay [s]	1.02	1.37	1.37	1.01	1.35	1.34	50.23	50.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.50	0.52	0.02	0.46	0.48	2.12	2.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.31	0.31	0.01	0.30	0.30	0.45	0.55
d, Delay for Lane Group [s/veh]	1.05	1.87	1.88	1.03	1.81	1.83	52.35	53.66
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.05	1.09	1.03	0.03	1.02	0.97	1.94	2.45
50th-Percentile Queue Length [ft/ln]	1.32	27.34	25.82	0.79	25.53	24.21	48.43	61.35
95th-Percentile Queue Length [veh/ln]	0.09	1.97	1.86	0.06	1.84	1.74	3.49	4.42
95th-Percentile Queue Length [ft/ln]	2.37	49.21	46.47	1.43	45.96	43.58	87.18	110.43

**Movement, Approach, & Intersection Results**

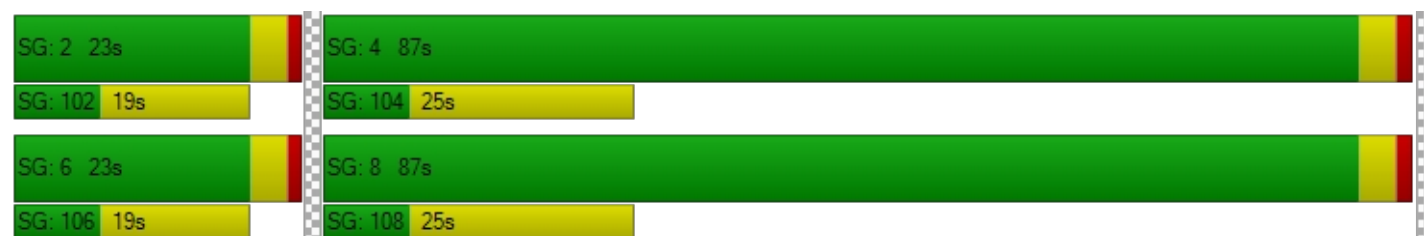
d_M, Delay for Movement [s/veh]	1.05	1.87	1.88	1.03	1.82	1.83	52.35	52.35	52.35	53.66	53.66	53.66
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.85			1.80			52.35			53.66		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.52											
Intersection LOS	A											
Intersection V/C	0.343											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.752			2.717			1.840			1.828		
Crosswalk LOS	C			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.408			2.358			1.673			1.702		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.922

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	164	1542	170	160	1455	222	212	578	156	180	756	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	164	1542	170	160	1455	222	212	578	156	180	756	255
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	386	43	40	364	56	53	145	39	45	189	64
Total Analysis Volume [veh/h]	164	1542	170	160	1455	222	212	578	156	180	756	255
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	26	57	0	12	33	0	10	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	62	51	51	62	52	52	40	29	29	40	27	27
g / C, Green / Cycle	0.56	0.46	0.46	0.56	0.47	0.47	0.36	0.26	0.26	0.36	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.09	0.41	0.09	0.09	0.46	0.45	0.12	0.15	0.09	0.10	0.20	0.14
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	319	1766	837	451	899	852	411	998	473	511	930	440
d1, Uniform Delay [s]	11.49	26.51	17.40	11.47	28.03	27.79	25.29	35.26	32.73	24.79	39.18	36.56
k, delay calibration	0.11	0.11	0.11	0.11	0.43	0.42	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.29	1.47	0.12	0.47	20.15	19.03	1.00	2.45	1.86	1.90	7.73	5.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	0.87	0.20	0.35	0.96	0.95	0.52	0.58	0.33	0.35	0.81	0.58
d, Delay for Lane Group [s/veh]	12.78	27.98	17.51	11.94	48.17	46.82	26.29	37.71	34.60	26.69	46.91	42.03
Lane Group LOS	B	C	B	B	D	D	C	D	C	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.00	17.83	2.56	1.89	26.03	24.03	4.10	7.03	3.60	3.59	10.52	6.67
50th-Percentile Queue Length [ft/ln]	49.91	445.83	63.88	47.28	650.69	600.67	102.45	175.76	89.94	89.64	263.06	166.63
95th-Percentile Queue Length [veh/ln]	3.59	24.76	4.60	3.40	34.39	32.07	7.38	11.38	6.48	6.45	15.84	10.90
95th-Percentile Queue Length [ft/ln]	89.84	618.97	114.99	85.11	859.86	801.64	184.41	284.46	161.89	161.36	396.05	272.49

**Movement, Approach, & Intersection Results**

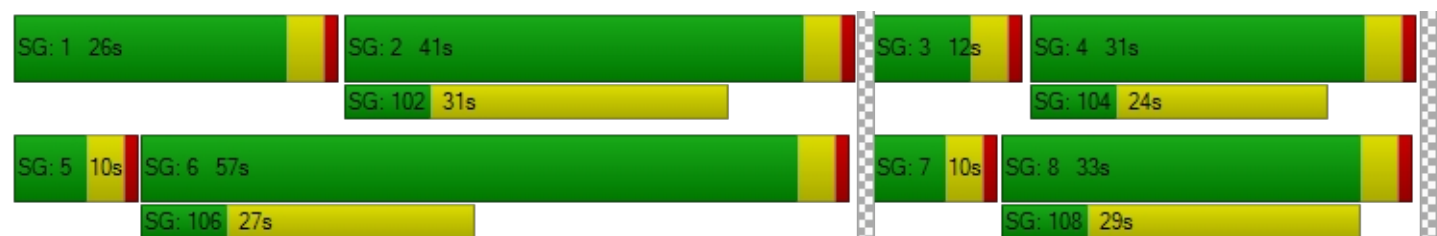
d_M, Delay for Movement [s/veh]	12.78	27.98	17.51	11.94	47.62	46.82	26.29	37.71	34.60	26.69	46.91	42.03
Movement LOS	B	C	B	B	D	D	C	D	C	C	D	D
d_A, Approach Delay [s/veh]	25.71			44.42			34.64			42.81		
Approach LOS	C			D			C			D		
d_I, Intersection Delay [s/veh]	36.51											
Intersection LOS	D											
Intersection V/C	0.922											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.130			3.139			2.916			2.913		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			964			527			491		
d_b, Bicycle Delay [s]	24.22			14.77			29.82			31.31		
I_b,int, Bicycle LOS Score for Intersection	3.107			3.075			2.340			2.542		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.749

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	137	843	239	46	898	95	142	726	143	364	898	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	843	239	46	898	95	142	726	143	364	898	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	211	60	12	225	24	36	182	36	91	225	11
Total Analysis Volume [veh/h]	137	843	239	46	898	95	142	726	143	364	898	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	31	56	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	36	36	45	33	33	11	39	39	14	43	43
g / C, Green / Cycle	0.41	0.33	0.33	0.41	0.30	0.30	0.10	0.36	0.36	0.13	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.13	0.03	0.27	0.26	0.08	0.19	0.08	0.10	0.24	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	362	1251	593	484	578	547	175	1350	640	448	1467	695
d1, Uniform Delay [s]	20.90	31.82	28.56	19.81	36.66	36.20	48.71	28.28	24.86	46.73	27.18	21.25
k, delay calibration	0.11	0.11	0.11	0.11	0.13	0.12	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	0.64	0.44	0.08	6.36	4.71	8.68	1.54	0.81	3.62	1.92	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.67	0.40	0.10	0.90	0.87	0.81	0.54	0.22	0.81	0.61	0.06
d, Delay for Lane Group [s/veh]	21.55	32.46	29.00	19.90	43.02	40.92	57.39	29.82	25.66	50.35	29.09	21.42
Lane Group LOS	C	C	C	B	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.33	9.66	4.93	0.73	14.14	12.57	4.23	7.83	2.75	5.06	9.71	0.71
50th-Percentile Queue Length [ft/ln]	58.13	241.41	123.24	18.27	353.46	314.26	105.83	195.69	68.84	126.40	242.87	17.85
95th-Percentile Queue Length [veh/ln]	4.19	14.75	8.57	1.32	20.31	18.39	7.61	12.42	4.96	8.74	14.83	1.29
95th-Percentile Queue Length [ft/ln]	104.63	368.82	214.27	32.88	507.63	459.63	190.19	310.40	123.91	218.58	370.66	32.14

**Movement, Approach, & Intersection Results**

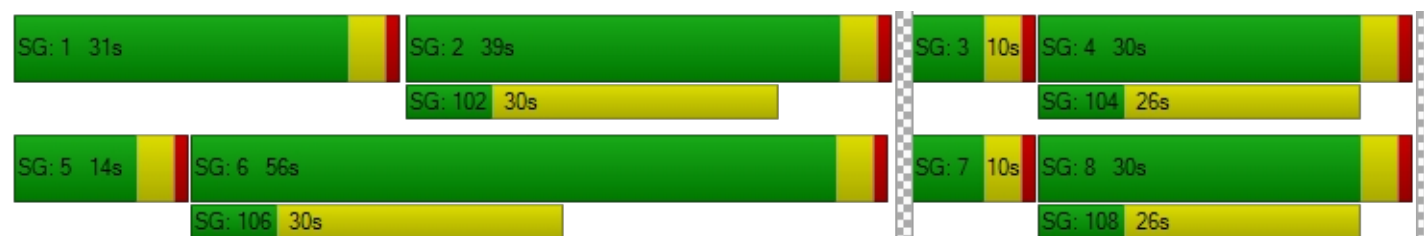
d_M, Delay for Movement [s/veh]	21.55	32.46	29.00	19.90	42.13	40.92	57.39	29.82	25.66	50.35	29.09	21.42
Movement LOS	C	C	C	B	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	30.56			41.04			33.11			34.78		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	34.71											
Intersection LOS	C											
Intersection V/C	0.749											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.889			2.712			2.873			2.949		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			945			473			473		
d_b, Bicycle Delay [s]	25.57			15.29			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.565			2.417			2.394			2.635		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.799

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	82	1637	44	165	1873	80	103	121	159	139	173	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	1637	44	165	1873	80	103	121	159	139	173	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	409	11	41	468	20	26	30	40	35	43	27
Total Analysis Volume [veh/h]	82	1637	44	165	1873	80	103	121	159	139	173	109
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	52	0	0	52	0	0	58	0	0	58	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	26	26	26
g / C, Green / Cycle	0.69	0.69	0.69	0.69	0.69	0.69	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.46	0.45	0.09	0.53	0.53	0.21	0.08	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	671	1320	1251	823	1320	1251	460	79	418
d1, Uniform Delay [s]	5.36	9.39	9.37	5.63	10.84	10.84	41.10	33.84	38.37
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.37	2.55	2.66	0.55	4.15	4.38	4.00	354.43	1.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.65	0.65	0.20	0.76	0.76	0.83	1.76	0.67
d, Delay for Lane Group [s/veh]	5.73	11.94	12.03	6.18	14.99	15.21	45.10	388.26	40.26
Lane Group LOS	A	B	B	A	B	B	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.62	11.17	10.56	1.30	15.22	14.50	10.50	9.46	7.09
50th-Percentile Queue Length [ft/ln]	15.59	279.14	264.01	32.42	380.54	362.44	262.56	236.38	177.20
95th-Percentile Queue Length [veh/ln]	1.12	16.65	15.89	2.33	21.62	20.74	15.82	17.02	11.45
95th-Percentile Queue Length [ft/ln]	28.06	416.14	397.25	58.35	540.49	518.54	395.43	425.48	286.35

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.73	11.98	12.03	6.18	15.10	15.21	45.10	45.10	45.10	388.26	40.26	40.26
Movement LOS	A	B	B	A	B	B	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	11.69			14.41			45.10			155.16		
Approach LOS	B			B			D			F		
d_I, Intersection Delay [s/veh]	28.54											
Intersection LOS	C											
Intersection V/C	0.799											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.274			3.229			2.191			2.429		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			873			982			982		
d_b, Bicycle Delay [s]	17.47			17.47			14.25			14.25		
I_b,int, Bicycle LOS Score for Intersection	3.014			3.307			2.192			2.254		
Bicycle LOS	C			C			B			B		

**Sequence**


Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.579

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	168	1228	75	51	1248	146	90	42	147	127	38	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	168	1228	75	51	1248	146	90	42	147	127	38	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	307	19	13	312	37	23	11	37	32	10	11
Total Analysis Volume [veh/h]	168	1228	75	51	1248	146	90	42	147	127	38	44
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	40	0	0	40	0	0	70	0	0	70	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	83	83	83	83	83	83	19	19
g / C, Green / Cycle	0.75	0.75	0.75	0.75	0.75	0.75	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.09	0.35	0.35	0.03	0.38	0.37	0.16	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1105	1430	1355	1135	1430	1355	357	367
d1, Uniform Delay [s]	3.70	5.20	5.16	3.45	5.43	5.34	44.30	42.35
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	1.12	1.14	0.07	1.29	1.28	3.74	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.47	0.46	0.04	0.51	0.49	0.78	0.57
d, Delay for Lane Group [s/veh]	3.99	6.32	6.30	3.53	6.72	6.62	48.04	43.75
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.96	5.33	4.95	0.27	6.00	5.45	7.74	5.42
50th-Percentile Queue Length [ft/ln]	23.89	133.18	123.72	6.72	150.08	136.21	193.46	135.46
95th-Percentile Queue Length [veh/ln]	1.72	9.11	8.60	0.48	10.02	9.28	12.30	9.24
95th-Percentile Queue Length [ft/ln]	43.00	227.81	214.92	12.10	250.54	231.92	307.52	230.89

**Movement, Approach, & Intersection Results**

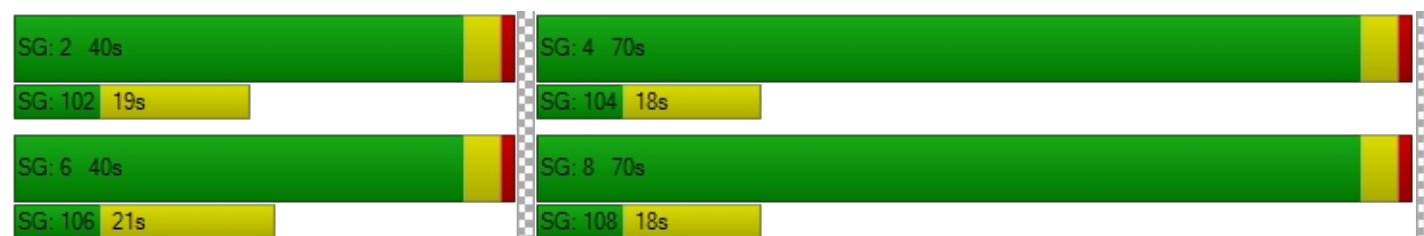
d_M, Delay for Movement [s/veh]	3.99	6.31	6.30	3.53	6.68	6.62	48.04	48.04	48.04	43.75	43.75	43.75
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	6.05			6.56			48.04			43.75		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.02											
Intersection LOS	B											
Intersection V/C	0.579											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.074			2.985			2.271			1.981		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			655			1200			1200		
d_b, Bicycle Delay [s]	24.89			24.89			8.80			8.80		
I_b,int, Bicycle LOS Score for Intersection	2.773			2.752			2.020			1.904		
Bicycle LOS	C			C			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	104.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.059

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	250	1760	297	289	1660	219	292	902	344	302	1082	293
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	1760	297	289	1660	219	292	902	344	302	1082	293
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	440	74	72	415	55	73	226	86	76	271	73
Total Analysis Volume [veh/h]	250	1760	297	289	1660	219	292	902	344	302	1082	293
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	11	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	38	38	7	37	37	16	35	35	14	33	33
g / C, Green / Cycle	0.07	0.35	0.35	0.06	0.34	0.34	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.46	0.17	0.08	0.40	0.19	0.16	0.16	0.19	0.17	0.19	0.16
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1311	621	223	1277	605	265	1805	570	233	1701	537
d1, Uniform Delay [s]	50.93	36.02	28.25	51.50	36.52	30.12	46.90	30.52	31.76	47.90	33.41	32.33
k, delay calibration	0.11	0.22	0.11	0.11	0.16	0.15	0.15	0.50	0.50	0.17	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.21	156.25	0.57	140.91	91.32	1.20	62.09	0.99	4.69	144.90	1.83	3.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	1.34	0.48	1.30	1.20	0.58	1.10	0.50	0.60	1.30	0.64	0.55
d, Delay for Lane Group [s/veh]	73.14	192.27	28.82	192.41	127.84	31.32	108.99	31.51	36.44	192.80	35.24	36.27
Lane Group LOS	E	F	C	F	F	C	F	C	D	F	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.21	45.60	6.19	7.42	32.92	7.78	11.79	6.59	8.39	15.70	8.54	7.07
50th-Percentile Queue Length [ft/ln]	105.28	1139.99	154.72	185.54	823.08	194.49	294.69	164.69	209.69	392.55	213.46	176.86
95th-Percentile Queue Length [veh/ln]	7.58	67.42	10.27	12.79	47.39	12.35	18.19	10.80	13.14	24.62	13.33	11.44
95th-Percentile Queue Length [ft/ln]	189.42	1685.57	256.72	319.86	1184.71	308.85	454.79	269.92	328.43	615.60	333.26	285.91

**Movement, Approach, & Intersection Results**

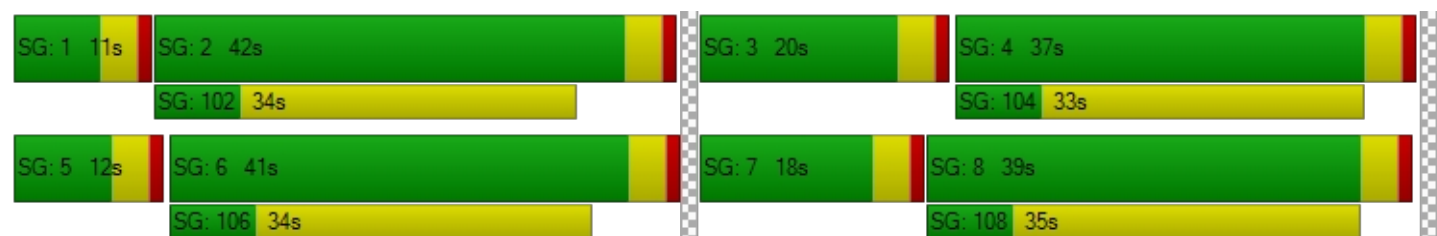
d_M, Delay for Movement [s/veh]	73.14	192.27	28.82	192.41	120.19	31.32	108.99	31.51	36.44	192.80	35.24	36.27
Movement LOS	E	F	C	F	F	C	F	C	D	F	D	D
d_A, Approach Delay [s/veh]	158.32			120.84			47.32			63.79		
Approach LOS	F			F			D			E		
d_I, Intersection Delay [s/veh]	104.94											
Intersection LOS	F											
Intersection V/C	1.059											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.297			3.232			3.111			3.121		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			673			636			600		
d_b, Bicycle Delay [s]	23.56			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.463			2.752			2.406			2.482		
Bicycle LOS	C			C			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	49.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.028

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	356	1259	135	195	1195	198	226	864	347	360	893	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	356	1259	135	195	1195	198	226	864	347	360	893	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	315	34	49	299	50	57	216	87	90	223	53
Total Analysis Volume [veh/h]	356	1259	135	195	1195	198	226	864	347	360	893	210
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	38	0	16	38	0	18	39	0	17	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	37	37	50	34	34	14	35	35	13	34	34
g / C, Green / Cycle	0.45	0.33	0.33	0.45	0.31	0.31	0.13	0.32	0.32	0.12	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.20	0.33	0.08	0.11	0.31	0.11	0.13	0.23	0.19	0.10	0.31	0.29
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	362	1263	598	321	1173	556	232	1207	572	417	585	554
d1, Uniform Delay [s]	20.42	36.67	26.51	18.37	38.02	29.53	47.73	33.15	31.73	47.58	37.96	37.13
k, delay calibration	0.16	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	23.15	11.09	0.19	1.86	17.18	0.39	21.85	3.65	4.74	5.44	35.53	26.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	1.00	0.23	0.61	1.02	0.36	0.97	0.72	0.61	0.86	0.99	0.94
d, Delay for Lane Group [s/veh]	43.57	47.75	26.70	20.24	55.20	29.92	69.57	36.80	36.46	53.02	73.49	63.60
Lane Group LOS	D	D	C	C	F	C	E	D	D	D	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.44	18.43	2.59	3.18	18.27	4.12	7.55	10.66	8.47	5.14	21.03	17.51
50th-Percentile Queue Length [ft/ln]	211.09	460.69	64.67	79.53	456.82	102.90	188.68	266.39	211.84	128.46	525.80	437.63
95th-Percentile Queue Length [veh/ln]	13.21	25.47	4.66	5.73	25.59	7.41	12.05	16.01	13.25	8.86	28.55	24.37
95th-Percentile Queue Length [ft/ln]	330.23	636.69	116.41	143.16	639.69	185.22	301.31	400.23	331.18	221.41	713.83	609.17

**Movement, Approach, & Intersection Results**

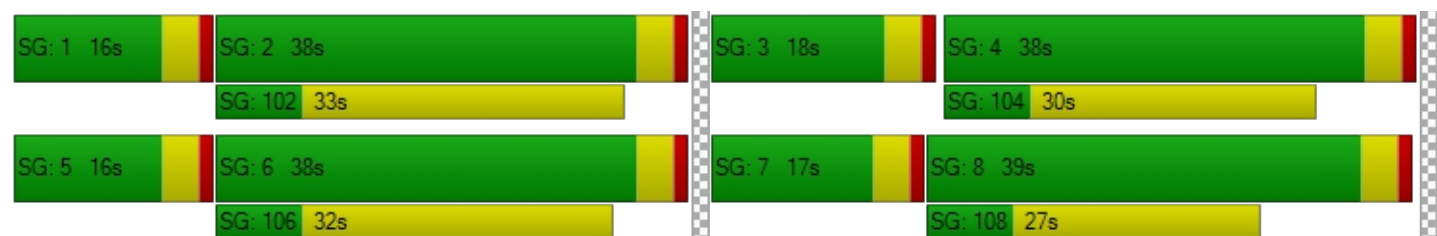
d_M, Delay for Movement [s/veh]	43.57	47.75	26.70	20.24	55.20	29.92	69.57	36.80	36.46	53.02	70.03	63.60
Movement LOS	D	D	C	C	F	C	E	D	D	D	E	E
d_A, Approach Delay [s/veh]	45.28			47.75			41.87			64.92		
Approach LOS	D			D			D			E		
d_I, Intersection Delay [s/veh]	49.73											
Intersection LOS	D											
Intersection V/C	1.028											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.056			2.996			3.097			3.071		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	618			618			636			618		
d_b, Bicycle Delay [s]	26.25			26.25			25.57			26.25		
I_b,int, Bicycle LOS Score for Intersection	3.003			2.870			2.350			2.767		
Bicycle LOS	C			C			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.962

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	554	0	0	436	239	0	0	0	59	112	126
Total Analysis Volume [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	67	0	0	57	0	0	0	0	0	33	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.04	0.39	0.46	0.53		0.13	0.12	0.28
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3591	2018	956		522	1102	522
d1, Uniform Delay [s]	45.89	11.20	20.32	23.45		29.03	28.58	35.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.74	0.80	5.21	29.15		0.62	0.24	28.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.62	0.86	1.00		0.45	0.41	0.97
d, Delay for Lane Group [s/veh]	48.63	12.00	25.53	52.60		29.65	28.83	63.26
Lane Group LOS	D	B	C	F		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.56	9.20	17.77	28.39		4.69	4.32	15.91
50th-Percentile Queue Length [ft/ln]	39.04	230.08	444.27	709.68		117.14	108.10	397.81
95th-Percentile Queue Length [veh/ln]	2.81	14.18	24.68	37.13		8.24	7.73	22.45
95th-Percentile Queue Length [ft/ln]	70.28	354.46	617.10	928.26		205.88	193.35	561.37

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.63	12.00	0.00	0.00	25.53	52.60	0.00	0.00	0.00	29.65	28.83	63.26
Movement LOS	D	B			C	F				C	C	E
d_A, Approach Delay [s/veh]	13.93			35.12			0.00			43.59		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	28.78											
Intersection LOS	C											
Intersection V/C	0.962											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.465			2.426		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1260			1060			0			580		
d_b, Bicycle Delay [s]	6.85			11.05			50.00			25.21		
I_b,int, Bicycle LOS Score for Intersection	2.846			3.044			4.132			2.542		
Bicycle LOS	C			C			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	54.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.082

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	306	0	0	349	105	0	0	0	36	176	250
Total Analysis Volume [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	45	0	0	35	0	0	0	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	41	31	31		51	51	51
g / C, Green / Cycle	0.06	0.41	0.31	0.31		0.51	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.32	0.34		0.24	0.22	0.55
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2348	1182	560		914	965	914
d1, Uniform Delay [s]	46.96	22.02	34.45	34.45		15.91	15.49	24.60
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.83	32.49	61.80		0.38	0.30	57.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.52	1.02	1.08		0.47	0.43	1.09
d, Delay for Lane Group [s/veh]	89.94	22.85	66.94	96.25		16.29	15.79	82.45
Lane Group LOS	F	C	F	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	7.18	19.29	22.83		6.19	5.80	34.68
50th-Percentile Queue Length [ft/ln]	100.53	179.58	482.27	570.86		154.68	144.89	867.06
95th-Percentile Queue Length [veh/ln]	7.24	11.58	26.91	32.24		10.27	9.74	47.47
95th-Percentile Queue Length [ft/ln]	180.95	289.47	672.82	806.04		256.67	243.59	1186.84

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	22.85	0.00	0.00	70.85	96.25	0.00	0.00	0.00	16.29	16.00	82.45
Movement LOS	F	C			E	F				B	B	F
d_A, Approach Delay [s/veh]	28.43			76.71			0.00			51.98		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	54.68											
Intersection LOS	D											
Intersection V/C	1.082											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.320			2.544		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	820			620			0			1020		
d_b, Bicycle Delay [s]	17.41			23.81			50.00			12.01		
I_b,int, Bicycle LOS Score for Intersection	2.294			2.558			4.132			3.081		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.844

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	327	75	163	341	0	286	91	49	0	0	0
Total Analysis Volume [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	31	31	21	56	36	36	36	
g / C, Green / Cycle	0.31	0.31	0.21	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.23	0.17	0.19	0.24	0.33	0.19	0.11	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	1760	556	729	3175	1270	690	653	
d1, Uniform Delay [s]	31.01	28.65	38.52	12.89	30.13	25.10	22.78	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.89	3.71	4.16	0.43	2.60	0.63	0.26	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.74	0.54	0.89	0.43	0.90	0.53	0.30	
d, Delay for Lane Group [s/veh]	33.90	32.36	42.68	13.32	32.73	25.73	23.04	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	9.70	6.42	8.08	5.75	13.03	6.79	3.32	
50th-Percentile Queue Length [ft/ln]	242.57	160.55	201.94	143.63	325.69	169.74	83.08	
95th-Percentile Queue Length [veh/ln]	14.81	10.58	12.74	9.68	18.95	11.06	5.98	
95th-Percentile Queue Length [ft/ln]	370.28	264.46	318.47	241.90	473.68	276.57	149.54	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	33.90	32.36	42.68	13.32	0.00	32.73	25.73	23.04	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	33.61			22.82			30.11			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	28.41											
Intersection LOS	C											
Intersection V/C	0.844											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.551			2.361		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.443			2.667			4.371			4.132		
Bicycle LOS	B			B			E			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	211	47	191	218	0	87	234	17	0	0	0
Total Analysis Volume [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	25	0	28	53	0	0	47	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	26	26	24	53	39	39	39	
g / C, Green / Cycle	0.26	0.26	0.24	0.53	0.39	0.39	0.39	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.19	0.22	0.23	0.36	0.33	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	977	463	824	2024	697	736	697	
d1, Uniform Delay [s]	33.68	34.10	37.37	14.16	29.28	28.19	19.51	
k, delay calibration	0.50	0.50	0.11	0.50	0.34	0.30	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	4.23	10.29	5.09	0.67	15.27	8.11	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.70	0.74	0.93	0.43	0.93	0.86	0.10	
d, Delay for Lane Group [s/veh]	37.91	44.39	42.46	14.83	44.55	36.30	19.57	
Lane Group LOS	D	D	D	B	D	D	B	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.02	8.86	9.54	5.88	17.21	15.13	1.01	
50th-Percentile Queue Length [ft/ln]	200.52	221.56	238.42	147.10	430.16	378.36	25.27	
95th-Percentile Queue Length [veh/ln]	12.67	13.74	14.60	9.86	24.01	21.51	1.82	
95th-Percentile Queue Length [ft/ln]	316.64	343.61	365.04	246.55	600.23	537.87	45.48	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	39.12	44.39	42.46	14.83	0.00	44.55	38.94	19.57	0.00	0.00	0.00
Movement LOS		D	D	D	B		D	D	B			
d_A, Approach Delay [s/veh]	40.07			27.74			39.41			0.00		
Approach LOS	D			C			D			A		
d_I, Intersection Delay [s/veh]	34.83											
Intersection LOS	C											
Intersection V/C	0.873											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.383			2.638		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	420			980			860			0		
d_b, Bicycle Delay [s]	31.21			13.01			16.25			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.127			2.907			2.673			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.137

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	95	348	201	255	603
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	95	348	201	255	603
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	24	87	50	64	151
Total Analysis Volume [veh/h]	0	95	348	201	255	603
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.14	0.00	0.00	0.25	0.01
d_M, Delay for Movement [s/veh]	0.00	11.00	0.00	0.00	9.70	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.47	0.00	0.00	0.99	0.00
95th-Percentile Queue Length [ft/ln]	0.00	11.80	0.00	0.00	24.72	0.00
d_A, Approach Delay [s/veh]	11.00		0.00		2.88	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.34					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	959	47	18	509	0	32	0	65	221	0	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	959	47	18	509	0	32	0	65	221	0	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	240	12	5	127	0	8	0	16	55	0	12
Total Analysis Volume [veh/h]	0	959	47	18	509	0	32	0	65	221	0	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	55	0	10	65	0	0	45	0	45	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	80	80	86	86	16	16	16	16
g / C, Green / Cycle	0.73	0.73	0.79	0.79	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.26	0.28	0.01	0.13	0.02	0.04	0.12	0.03
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1377	1305	1303	2984	290	288	233	256
d1, Uniform Delay [s]	5.67	5.78	2.56	2.93	41.20	41.99	46.13	41.55
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.75	0.86	0.00	0.12	0.17	0.39	17.54	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.39	0.01	0.17	0.11	0.23	0.95	0.18
d, Delay for Lane Group [s/veh]	6.42	6.64	2.57	3.05	41.37	42.38	63.67	41.90
Lane Group LOS	A	A	A	A	D	D	E	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.06	4.16	0.07	1.13	0.77	1.60	7.01	1.15
50th-Percentile Queue Length [ft/ln]	101.40	103.97	1.71	28.31	19.33	40.11	175.29	28.75
95th-Percentile Queue Length [veh/ln]	7.30	7.49	0.12	2.04	1.39	2.89	11.35	2.07
95th-Percentile Queue Length [ft/ln]	182.51	187.14	3.08	50.96	34.80	72.20	283.86	51.75

**Movement, Approach, & Intersection Results**

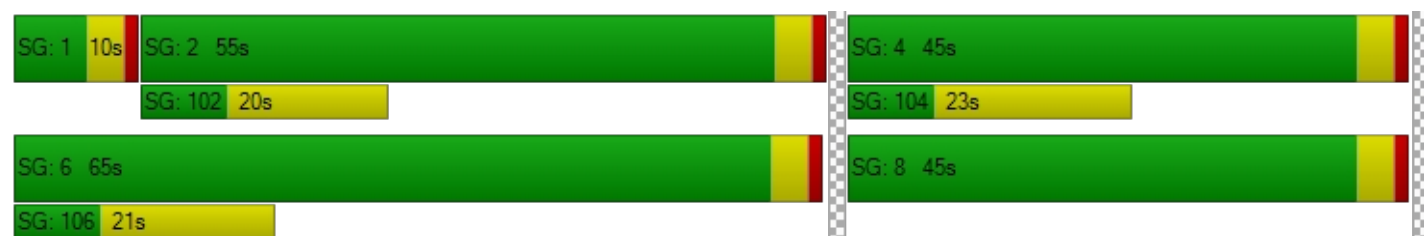
d_M, Delay for Movement [s/veh]	0.00	6.52	6.64	2.57	3.05	0.00	41.37	42.38	42.38	63.67	0.00	41.90
Movement LOS		A	A	A	A		D	D	D	E		D
d_A, Approach Delay [s/veh]	6.53			3.04			42.04			59.85		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	14.90											
Intersection LOS	B											
Intersection V/C	0.454											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.660			1.772			2.077		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			1109			745			0		
d_b, Bicycle Delay [s]	15.82			10.91			21.64			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.390			1.994			1.720			4.132		
Bicycle LOS	B			A			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	149.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	553	678	354	2	64	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	553	678	354	2	64	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	138	170	89	1	16	23
Total Analysis Volume [veh/h]	553	678	354	2	64	90
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.46	0.01	0.00	0.00	0.85	0.13
d_M, Delay for Movement [s/veh]	10.51	0.00	0.00	0.00	149.04	106.47
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	2.48	0.00	0.00	0.00	7.41	7.41
95th-Percentile Queue Length [ft/ln]	61.95	0.00	0.00	0.00	185.23	185.23
d_A, Approach Delay [s/veh]	4.72		0.00		124.16	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	14.32					
Intersection LOS	F					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	1226	450	0	8	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1226	450	0	8	182
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	307	113	0	2	46
Total Analysis Volume [veh/h]	0	1226	450	0	8	182
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.03	0.30
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	22.39	13.97
Movement LOS		A	A		C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	1.44	1.44
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	35.97	35.97
d_A, Approach Delay [s/veh]	0.00		0.00		14.33	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.46					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	25.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.087

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	1205	35	23	536	32	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1205	35	23	536	32	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	301	9	6	134	8	5
Total Analysis Volume [veh/h]	1205	35	23	536	32	19
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.04	0.01	0.13	0.09
d_M, Delay for Movement [s/veh]	0.00	0.00	11.68	0.00	24.08	25.72
Movement LOS	A	A	B	A	C	D
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.13	0.00	0.81	0.81
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.20	0.00	20.26	20.26
d_A, Approach Delay [s/veh]	0.00		0.48		24.69	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.83					
Intersection LOS	D					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.123

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	654	355	0	509	6	0	0	29	0	0	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	654	355	0	509	6	0	0	29	0	0	63
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	164	89	0	127	2	0	0	7	0	0	16
Total Analysis Volume [veh/h]	6	654	355	0	509	6	0	0	29	0	0	63
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.12
d_M, Delay for Movement [s/veh]	8.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	0.00	0.00	13.00
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.42
95th-Percentile Queue Length [ft/ln]	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05	0.00	0.00	10.43
d_A, Approach Delay [s/veh]	0.05			0.00			10.05			13.00		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	0.72											
Intersection LOS	B											

*APPENDIX G-VI*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	37.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	133	928	103	200	900	206	217	805	157	203	814	187
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	928	103	200	900	206	217	805	157	203	814	187
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	232	26	50	225	52	54	201	39	51	204	47
Total Analysis Volume [veh/h]	133	928	103	200	900	206	217	805	157	203	814	187
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	10	42	0	16	46	0	12	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	56	56	6	56	56	12	24	24	8	20	20
g / C, Green / Cycle	0.05	0.51	0.51	0.05	0.51	0.51	0.11	0.22	0.22	0.07	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.06	0.06	0.20	0.20	0.12	0.17	0.17	0.06	0.14	0.10
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	191	2904	917	191	1936	917	194	827	392	255	1040	328
d1, Uniform Delay [s]	51.10	15.80	14.03	52.00	16.48	16.51	49.07	40.60	40.79	50.20	42.89	41.03
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.49	0.29	0.25	42.88	0.58	1.25	67.61	1.68	3.84	5.63	1.33	1.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.70	0.32	0.11	1.05	0.39	0.39	1.12	0.78	0.80	0.80	0.78	0.57
d, Delay for Lane Group [s/veh]	55.60	16.09	14.28	94.88	17.06	17.75	116.68	42.28	44.63	55.83	44.22	42.58
Lane Group LOS	E	B	B	F	B	B	F	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.92	4.55	1.39	3.77	5.80	5.72	8.95	8.40	8.40	2.94	7.12	4.75
50th-Percentile Queue Length [ft/ln]	47.93	113.84	34.66	94.24	145.11	142.93	223.80	210.10	210.07	73.53	178.11	118.85
95th-Percentile Queue Length [veh/ln]	3.45	8.05	2.50	6.79	9.76	9.64	14.47	13.16	13.16	5.29	11.50	8.33
95th-Percentile Queue Length [ft/ln]	86.27	201.34	62.40	169.63	243.89	240.96	361.64	328.96	328.92	132.36	287.54	208.25

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	55.60	16.09	14.28	94.88	17.18	17.75	116.68	42.74	44.63	55.83	44.22	42.58
Movement LOS	E	B	B	F	B	B	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	20.45			29.17			56.60			45.92		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	37.90											
Intersection LOS	D											
Intersection V/C	0.585											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.121			3.057			2.928			3.109		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			764			691		
d_b, Bicycle Delay [s]	23.56			23.56			21.02			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.200			2.278			2.208			2.222		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	7	1047	646	58	1261	12	30	97	15	616	68	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1047	646	58	1261	12	30	97	15	616	68	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	262	162	15	315	3	8	24	4	154	17	0
Total Analysis Volume [veh/h]	7	1047	646	58	1261	12	30	97	15	616	68	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	20	31	0	20	31	0	0	29	0	0	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	58	5	62	62	8	8	8	23	23
g / C, Green / Cycle	0.01	0.53	0.05	0.56	0.56	0.07	0.07	0.07	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.00	0.18	0.03	0.27	0.14	0.02	0.05	0.01	0.19	0.19
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	21	3001	83	2132	1010	127	134	127	381	381
d1, Uniform Delay [s]	53.99	15.12	51.75	14.50	12.33	48.37	50.13	47.97	42.22	42.30
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.23	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.16	0.32	10.02	0.77	0.59	0.95	7.23	0.41	14.05	14.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.35	0.70	0.48	0.25	0.24	0.72	0.12	0.89	0.90
d, Delay for Lane Group [s/veh]	63.15	15.44	61.77	15.27	12.92	49.32	57.36	48.38	56.27	57.28
Lane Group LOS	E	B	E	B	B	D	E	D	E	E
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.25	5.03	1.81	7.56	3.24	0.81	2.88	0.40	10.41	10.59
50th-Percentile Queue Length [ft/ln]	6.13	125.76	45.17	188.92	81.01	20.32	72.00	10.02	260.13	264.79
95th-Percentile Queue Length [veh/ln]	0.44	8.71	3.25	12.06	5.83	1.46	5.18	0.72	15.70	15.93
95th-Percentile Queue Length [ft/ln]	11.03	217.72	81.31	301.62	145.82	36.57	129.59	18.04	392.38	398.22

**Movement, Approach, & Intersection Results**

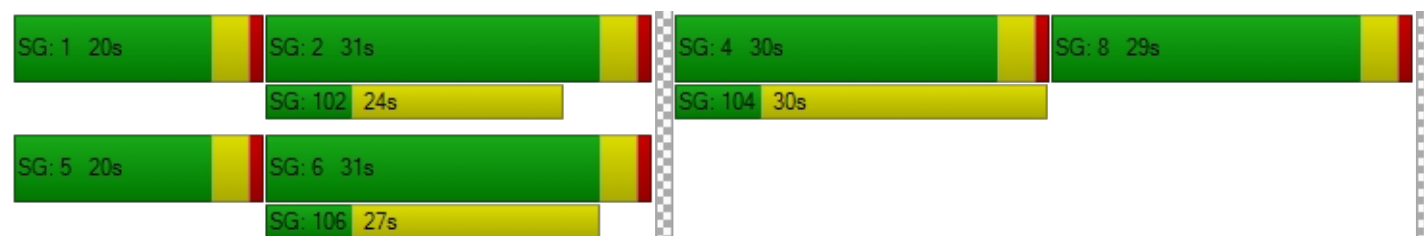
d_M, Delay for Movement [s/veh]	63.15	15.44	0.00	61.77	14.82	12.92	49.32	57.36	48.38	56.72	57.28	0.00
Movement LOS	E	B		E	B	B	D	E	D	E	E	
d_A, Approach Delay [s/veh]	15.76			16.85			54.71			56.78		
Approach LOS	B			B			D			E		
d_I, Intersection Delay [s/veh]	26.67											
Intersection LOS	C											
Intersection V/C	0.602											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.939			2.196			2.222		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			455			473		
d_b, Bicycle Delay [s]	31.31			31.31			32.84			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.139			2.292			1.794			2.688		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	28	1365	36	175	1701	3	22	67	26	47	97	363
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1365	36	175	1701	3	22	67	26	47	97	363
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	341	9	44	425	1	6	17	7	12	24	91
Total Analysis Volume [veh/h]	28	1365	36	175	1701	3	22	67	26	47	97	363
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	56	0	17	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	3	64	64	13	73	73	21	21	21	21	21	38
g / C, Green / Cycle	0.03	0.58	0.58	0.12	0.67	0.67	0.19	0.19	0.19	0.19	0.19	0.35
(v / s)_i Volume / Saturation Flow Rate	0.02	0.38	0.38	0.05	0.45	0.00	0.01	0.04	0.01	0.03	0.05	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	58	1101	1043	416	2531	1199	301	366	347	326	366	626
d1, Uniform Delay [s]	52.31	15.69	15.62	44.94	11.11	6.15	36.28	37.15	36.36	36.80	37.77	29.29
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.26
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.07	3.06	3.16	0.68	1.44	0.00	0.10	0.24	0.09	0.20	0.38	2.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.66	0.65	0.42	0.67	0.00	0.07	0.18	0.07	0.14	0.27	0.58
d, Delay for Lane Group [s/veh]	58.38	18.74	18.78	45.62	12.55	6.15	36.39	37.39	36.46	37.00	38.15	31.33
Lane Group LOS	E	B	B	D	B	A	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	12.54	11.78	2.25	11.77	0.02	0.49	1.54	0.58	1.07	2.26	8.10
50th-Percentile Queue Length [ft/ln]	21.43	313.45	294.49	56.35	294.33	0.58	12.34	38.41	14.58	26.72	56.61	202.55
95th-Percentile Queue Length [veh/ln]	1.54	18.35	17.41	4.06	17.40	0.04	0.89	2.77	1.05	1.92	4.08	12.77
95th-Percentile Queue Length [ft/ln]	38.58	458.63	435.21	101.43	435.01	1.05	22.20	69.13	26.24	48.10	101.90	319.26

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.38	18.76	18.78	45.62	12.55	6.15	36.39	37.39	36.46	37.00	38.15	31.33
Movement LOS	E	B	B	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	19.53			15.62			36.99			33.16		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	19.93											
Intersection LOS	B											
Intersection V/C	0.715											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.001			3.140			2.200			2.462		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			1073			600			600		
d_b, Bicycle Delay [s]	15.29			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.739			3.110			1.749			2.396		
Bicycle LOS	B			C			A			B		

**Sequence**



Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	72.9
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	56	15	16	64	8	5	51	26	43	66	16
Total Analysis Volume [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	34	0	0	45	45	0	45	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	42	42	42	42	14	14	60	14	14	14
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.13	0.13	0.55	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.12	0.13	0.03	0.04	0.16	0.01	0.11	0.06	0.09	0.09	0.09
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	686	686	686	686	686	123	244	983	93	244	232
d1, Uniform Delay [s]	23.98	24.15	21.77	21.82	25.02	42.21	46.68	12.02	43.99	45.86	45.62
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.24	1.33	0.25	0.27	1.86	0.65	6.97	0.22	379.31	3.67	3.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.32	0.34	0.09	0.09	0.42	0.17	0.83	0.11	1.82	0.70	0.67
d, Delay for Lane Group [s/veh]	25.22	25.48	22.02	22.09	26.88	42.86	53.64	12.24	423.30	49.53	48.90
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.26	4.50	1.04	1.11	5.80	0.53	5.84	1.28	12.16	4.73	4.21
50th-Percentile Queue Length [ft/ln]	106.56	112.58	26.04	27.84	144.97	13.17	145.96	32.11	304.02	118.32	105.35
95th-Percentile Queue Length [veh/ln]	7.65	7.98	1.87	2.00	9.75	0.95	9.80	2.31	21.25	8.30	7.58
95th-Percentile Queue Length [ft/ln]	191.20	199.59	46.87	50.12	243.70	23.70	245.03	57.80	531.18	207.52	189.51

**Movement, Approach, & Intersection Results**

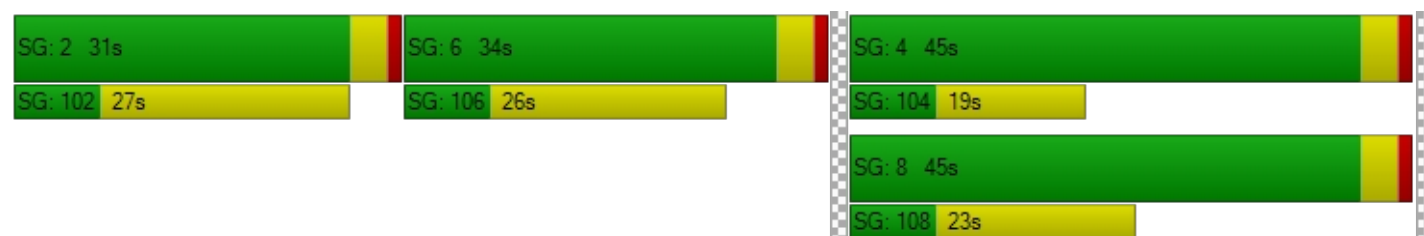
d_M, Delay for Movement [s/veh]	25.22	25.48	22.02	22.09	26.88	26.88	42.86	53.64	12.24	423.30	49.31	48.90
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	24.96			26.01			39.70			177.44		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	72.90											
Intersection LOS	E											
Intersection V/C	0.442											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.637			2.194			2.475			2.341		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			545			745			745		
d_b, Bicycle Delay [s]	31.31			29.09			21.64			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.404			2.137			2.101			1.969		
Bicycle LOS	B			B			B			A		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.337

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	130	97	456	386	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	130	97	456	386	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	33	24	114	97	3
Total Analysis Volume [veh/h]	17	130	97	456	386	12
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	10	92	92	92	92
g / C, Green / Cycle	0.09	0.09	0.84	0.84	0.84	0.84
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07	0.05	0.24	0.20	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	164	164	1446	1588	1588	1505
d1, Uniform Delay [s]	45.79	48.89	1.56	1.95	1.86	1.49
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	8.27	0.09	0.46	0.36	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.79	0.07	0.29	0.24	0.01
d, Delay for Lane Group [s/veh]	46.06	57.16	1.65	2.40	2.22	1.50
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.44	3.86	0.25	1.48	1.19	0.03
50th-Percentile Queue Length [ft/ln]	10.98	96.52	6.35	36.91	29.75	0.74
95th-Percentile Queue Length [veh/ln]	0.79	6.95	0.46	2.66	2.14	0.05
95th-Percentile Queue Length [ft/ln]	19.76	173.73	11.42	66.44	53.55	1.34

**Movement, Approach, & Intersection Results**

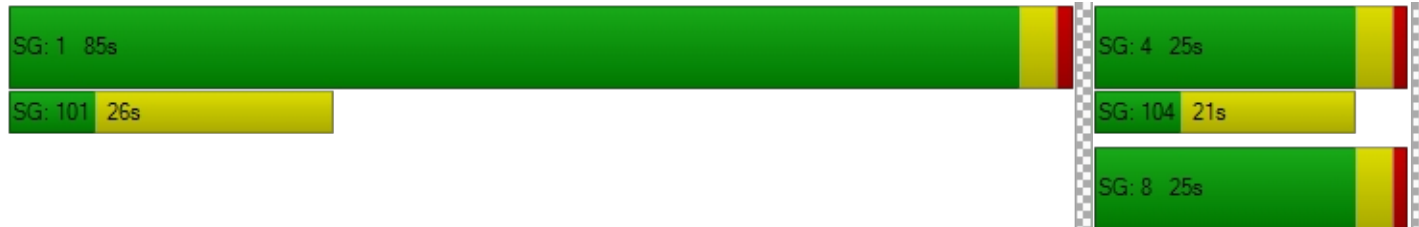
d_M, Delay for Movement [s/veh]	46.06	57.16	1.65	2.40	2.22	1.50
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	55.87		2.27		2.20	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	9.42					
Intersection LOS	A					
Intersection V/C	0.337					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.171	2.297	2.233
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.045	4.789
Bicycle LOS	D	F	E

**Sequence**



Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.600

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	70	1163	56	68	1160	64	61	230	84	122	341	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	1163	56	68	1160	64	61	230	84	122	341	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	291	14	17	290	16	15	58	21	31	85	36
Total Analysis Volume [veh/h]	70	1163	56	68	1160	64	61	230	84	122	341	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	34	0	11	29	0	27	54	0	11	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	75	66	66	75	66	66	27	16	16	27	18	18
g / C, Green / Cycle	0.68	0.60	0.60	0.68	0.60	0.60	0.25	0.15	0.15	0.25	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.04	0.33	0.33	0.04	0.33	0.33	0.03	0.09	0.08	0.07	0.14	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	933	1130	1070	935	1129	1070	309	279	265	402	312	296
d1, Uniform Delay [s]	5.88	13.54	13.44	5.87	13.60	13.49	32.25	43.88	43.64	33.42	44.52	43.91
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	1.99	2.03	0.03	2.02	2.05	0.31	2.01	1.85	0.42	5.71	3.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.56	0.55	0.07	0.56	0.55	0.20	0.59	0.56	0.30	0.83	0.76
d, Delay for Lane Group [s/veh]	6.04	15.53	15.47	5.91	15.62	15.54	32.55	45.90	45.49	33.84	50.23	47.89
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.54	9.56	8.89	0.50	9.65	8.94	1.30	4.38	3.88	2.68	7.31	6.14
50th-Percentile Queue Length [ft/ln]	13.56	239.12	222.18	12.38	241.31	223.52	32.44	109.40	96.95	67.05	182.83	153.41
95th-Percentile Queue Length [veh/ln]	0.98	14.64	13.78	0.89	14.75	13.84	2.34	7.81	6.98	4.83	11.75	10.20
95th-Percentile Queue Length [ft/ln]	24.40	365.92	344.41	22.29	368.70	346.11	58.40	195.17	174.50	120.69	293.71	254.98

**Movement, Approach, & Intersection Results**

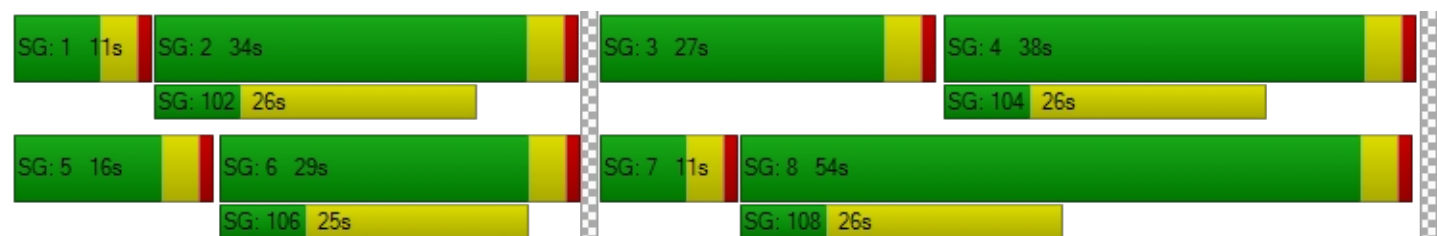
d_M, Delay for Movement [s/veh]	6.04	15.50	15.47	5.91	15.58	15.54	32.55	45.78	45.49	33.84	49.67	47.89
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	14.99			15.07			43.56			46.07		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	23.31											
Intersection LOS	C											
Intersection V/C	0.600											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.856			2.844			2.536			2.556		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			455			909			618		
d_b, Bicycle Delay [s]	29.09			32.84			16.36			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.623			2.626			1.869			2.060		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	46.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.996

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	146	1221	202	186	1307	151	216	640	149	437	974	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	146	1221	202	186	1307	151	216	640	149	437	974	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	305	51	47	327	38	54	160	37	109	244	36
Total Analysis Volume [veh/h]	146	1221	202	186	1307	151	216	640	149	437	974	142
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	49	0	11	50	0	12	30	0	20	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	56	45	45	56	46	46	46	26	26	46	34	34
g / C, Green / Cycle	0.51	0.41	0.41	0.51	0.42	0.42	0.42	0.23	0.23	0.42	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.08	0.39	0.38	0.10	0.40	0.39	0.12	0.22	0.21	0.24	0.26	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	338	781	740	348	799	757	403	444	421	450	1164	551
d1, Uniform Delay [s]	14.28	31.30	30.67	14.64	30.70	30.31	21.35	41.44	40.68	24.81	35.61	28.75
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.31	0.27	0.30	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.98	22.05	18.44	1.27	21.19	19.24	1.11	22.25	13.62	26.30	1.68	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.95	0.92	0.53	0.95	0.93	0.54	0.94	0.88	0.97	0.84	0.26
d, Delay for Lane Group [s/veh]	18.27	53.35	49.11	15.91	51.90	49.55	22.46	63.69	54.30	51.11	37.29	29.00
Lane Group LOS	B	D	D	B	D	D	C	E	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.29	23.21	20.36	2.63	23.34	21.14	3.79	13.76	11.16	11.92	12.25	2.86
50th-Percentile Queue Length [ft/ln]	57.28	580.23	508.89	65.64	583.54	528.42	94.85	343.94	278.88	297.98	306.22	71.43
95th-Percentile Queue Length [veh/ln]	4.12	31.11	27.76	4.73	31.27	28.68	6.83	19.84	16.63	17.58	17.99	5.14
95th-Percentile Queue Length [ft/ln]	103.10	777.75	693.88	118.16	781.63	716.92	170.72	496.01	415.81	439.53	449.71	128.57

**Movement, Approach, & Intersection Results**

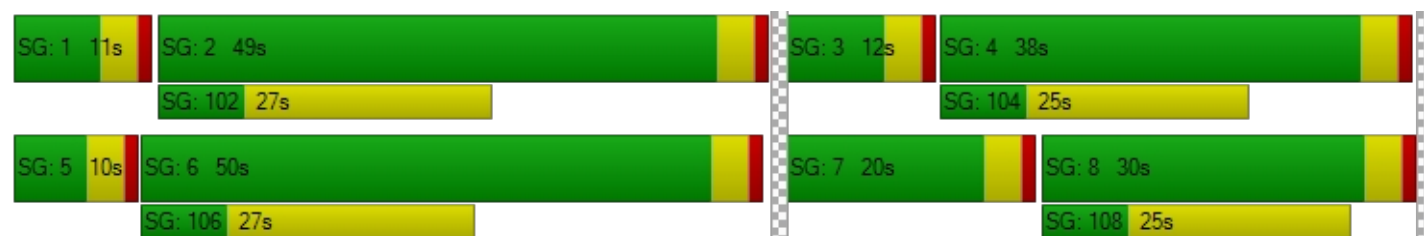
d_M, Delay for Movement [s/veh]	18.27	51.69	49.11	15.91	50.91	49.55	22.46	60.44	54.30	51.11	37.29	29.00
Movement LOS	B	D	D	B	D	D	C	E	D	D	D	C
d_A, Approach Delay [s/veh]	48.24			46.82			51.37			40.42		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	46.28											
Intersection LOS	D											
Intersection V/C	0.996											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.142			3.038			2.844			2.995		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			836			473			618		
d_b, Bicycle Delay [s]	19.20			18.62			32.07			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.854			2.916			2.389			2.841		
Bicycle LOS	C			C			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.803

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	116	371	169	170	530	398	161	814	138	399	1017	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	371	169	170	530	398	161	814	138	399	1017	50
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	93	42	43	133	100	40	204	35	100	254	13
Total Analysis Volume [veh/h]	116	371	169	170	530	398	161	814	138	399	1017	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	33	0	10	32	0	28	45	0	22	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	41	41	51	41	41	12	32	32	15	35	35
g / C, Green / Cycle	0.46	0.37	0.37	0.46	0.37	0.37	0.11	0.29	0.29	0.13	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.06	0.10	0.09	0.09	0.27	0.23	0.09	0.26	0.25	0.11	0.27	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	504	1415	670	804	708	671	195	556	527	470	1212	574
d1, Uniform Delay [s]	16.90	24.03	23.93	17.46	29.64	28.16	48.09	37.42	36.76	46.55	34.87	26.27
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.21	0.18	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	0.45	0.90	0.13	6.31	4.27	8.63	10.12	6.81	4.34	1.64	0.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.26	0.25	0.21	0.72	0.62	0.83	0.90	0.86	0.85	0.84	0.09
d, Delay for Lane Group [s/veh]	17.97	24.48	24.84	17.59	35.95	32.43	56.72	47.54	43.57	50.89	36.51	26.33
Lane Group LOS	B	C	C	B	D	C	E	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.82	3.43	3.20	2.56	12.64	9.59	4.78	14.32	12.27	5.59	12.73	0.93
50th-Percentile Queue Length [ft/ln]	45.52	85.87	80.10	64.01	315.88	239.77	119.48	358.07	306.86	139.86	318.36	23.33
95th-Percentile Queue Length [veh/ln]	3.28	6.18	5.77	4.61	18.46	14.67	8.36	20.53	18.02	9.47	18.59	1.68
95th-Percentile Queue Length [ft/ln]	81.94	154.56	144.17	115.23	461.62	366.74	209.11	513.23	450.51	236.84	464.66	41.99

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	17.97	24.48	24.84	17.59	35.83	32.43	56.72	46.01	43.57	50.89	36.51	26.33
Movement LOS	B	C	C	B	D	C	E	D	D	D	D	C
d_A, Approach Delay [s/veh]	23.42			31.78			47.26			40.08		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.30											
Intersection LOS	D											
Intersection V/C	0.803											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.742			2.637			2.890			3.063		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	527			509			745			636		
d_b, Bicycle Delay [s]	29.82			30.56			21.64			25.57		
I_b,int, Bicycle LOS Score for Intersection	2.101			2.465			2.478			2.769		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.639

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵			↵↵			↵↵			↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	5	21	32	766	16	325	48	1065	3	35	1215	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	21	32	766	16	325	48	1065	3	35	1215	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	5	8	192	4	81	12	266	1	9	304	52
Total Analysis Volume [veh/h]	5	21	32	766	16	325	48	1065	3	35	1215	208
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	5	5	28	37	65	65	65	56	56	88
g / C, Green / Cycle	0.05	0.05	0.05	0.25	0.34	0.59	0.59	0.59	0.51	0.51	0.80
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.02	0.22	0.19	0.03	0.29	0.29	0.02	0.32	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	87	82	893	607	735	1121	1062	645	1943	1445
d1, Uniform Delay [s]	50.24	50.66	51.01	39.09	29.82	9.50	13.00	12.99	13.40	19.32	2.42
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	1.42	2.97	2.53	0.82	0.04	1.53	1.61	0.16	1.53	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.24	0.39	0.86	0.56	0.07	0.49	0.49	0.05	0.63	0.14
d, Delay for Lane Group [s/veh]	50.73	52.08	53.98	41.62	30.64	9.53	14.53	14.60	13.56	20.85	2.47
Lane Group LOS	D	D	D	D	C	A	B	B	B	C	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	0.59	0.92	10.06	7.45	0.48	7.91	7.51	0.46	11.16	0.75
50th-Percentile Queue Length [ft/ln]	3.52	14.81	23.11	251.61	186.29	12.06	197.68	187.63	11.46	279.00	18.86
95th-Percentile Queue Length [veh/ln]	0.25	1.07	1.66	15.27	11.93	0.87	12.52	12.00	0.82	16.64	1.36
95th-Percentile Queue Length [ft/ln]	6.33	26.66	41.59	381.68	298.21	21.72	312.97	299.95	20.62	415.96	33.95

**Movement, Approach, & Intersection Results**

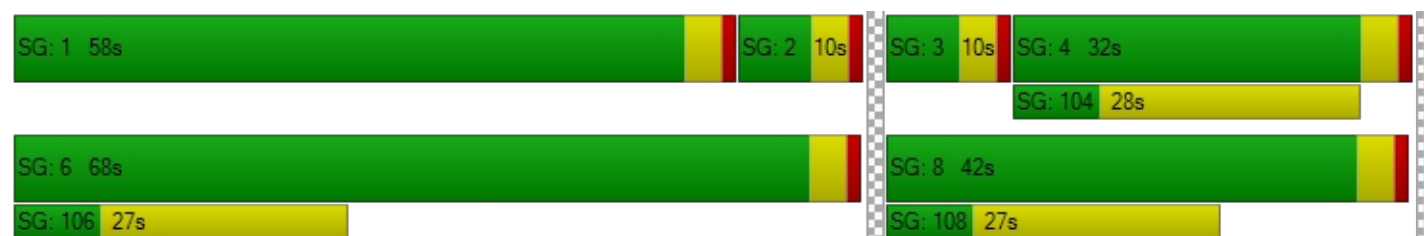
d_M, Delay for Movement [s/veh]	50.73	52.08	53.98	41.62	30.64	30.64	9.53	14.56	14.60	13.56	20.85	2.47
Movement LOS	D	D	D	D	C	C	A	B	B	B	C	A
d_A, Approach Delay [s/veh]	53.01			38.24			14.35			18.05		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.47											
Intersection LOS	C											
Intersection V/C	0.639											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.218			2.514			2.835			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.655			3.386			2.480			2.762		
Bicycle LOS	A			C			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	22.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.793

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	121	114	207	81	131	65	58	1543	242	193	1228	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	121	114	207	81	131	65	58	1543	242	193	1228	63
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	29	52	20	33	16	15	386	61	48	307	16
Total Analysis Volume [veh/h]	121	114	207	81	131	65	58	1543	242	193	1228	63
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	61	0	10	61	0	11	29	0	10	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	15	15	25	15	15	77	67	67	77	68	68
g / C, Green / Cycle	0.23	0.14	0.14	0.23	0.14	0.14	0.70	0.61	0.61	0.70	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.07	0.06	0.12	0.05	0.05	0.05	0.03	0.48	0.48	0.11	0.35	0.35
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	419	267	253	410	258	244	973	1149	1089	668	1174	1113
d1, Uniform Delay [s]	35.24	43.27	45.95	34.42	43.47	43.32	5.11	16.68	16.53	5.54	12.37	12.28
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.38	1.09	6.49	0.23	1.01	0.97	0.03	5.93	5.98	1.09	1.99	2.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.29	0.43	0.82	0.20	0.40	0.38	0.06	0.80	0.79	0.29	0.57	0.56
d, Delay for Lane Group [s/veh]	35.62	44.35	52.44	34.66	44.47	44.29	5.13	22.62	22.51	6.63	14.36	14.33
Lane Group LOS	D	D	D	C	D	D	A	C	C	A	B	B
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.74	2.92	5.93	1.79	2.65	2.36	0.38	18.29	17.04	1.56	9.67	9.01
50th-Percentile Queue Length [ft/ln]	68.38	72.94	148.18	44.66	66.22	58.99	9.56	457.13	426.07	38.94	241.66	225.16
95th-Percentile Queue Length [veh/ln]	4.92	5.25	9.92	3.22	4.77	4.25	0.69	25.30	23.81	2.80	14.77	13.93
95th-Percentile Queue Length [ft/ln]	123.09	131.30	247.99	80.39	119.20	106.18	17.21	632.45	595.33	70.09	369.13	348.20

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	35.62	44.35	52.44	34.66	44.43	44.29	5.13	22.57	22.51	6.63	14.34	14.33
Movement LOS	D	D	D	C	D	D	A	C	C	A	B	B
d_A, Approach Delay [s/veh]	45.75			41.54			22.01			13.34		
Approach LOS	D			D			C			B		
d_I, Intersection Delay [s/veh]	22.76											
Intersection LOS	C											
Intersection V/C	0.793											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.677			2.318			2.971			2.974		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1036			1036			455			436		
d_b, Bicycle Delay [s]	12.77			12.77			32.84			33.62		
I_b,int, Bicycle LOS Score for Intersection	2.289			1.788			3.080			2.784		
Bicycle LOS	B			A			C			C		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	52	35	107	59	50	34	22	1706	37	50	1431	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	35	107	59	50	34	22	1706	37	50	1431	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	9	27	15	13	9	6	427	9	13	358	10
Total Analysis Volume [veh/h]	52	35	107	59	50	34	22	1706	37	50	1431	38
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	9	9	9	9	9	93	84	84	93	86	86
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.85	0.77	0.77	0.85	0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.06	0.03	0.05	0.01	0.47	0.47	0.03	0.40	0.40
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	101	153	145	150	145	1339	1457	1381	1221	1488	1409
d1, Uniform Delay [s]	47.89	47.38	49.44	48.08	48.78	1.30	5.65	5.64	1.33	4.31	4.29
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.01	0.76	7.20	1.67	3.66	0.00	1.95	2.04	0.06	1.25	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.51	0.23	0.74	0.39	0.58	0.02	0.62	0.61	0.04	0.51	0.51
d, Delay for Lane Group [s/veh]	51.89	48.13	56.65	49.74	52.44	1.31	7.60	7.68	1.39	5.55	5.59
Lane Group LOS	D	D	E	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.46	0.93	3.16	1.61	2.37	0.04	7.94	7.53	0.11	5.20	4.90
50th-Percentile Queue Length [ft/ln]	36.57	23.28	78.96	40.19	59.22	1.04	198.55	188.16	2.83	130.07	122.56
95th-Percentile Queue Length [veh/ln]	2.63	1.68	5.68	2.89	4.26	0.07	12.56	12.03	0.20	8.94	8.53
95th-Percentile Queue Length [ft/ln]	65.83	41.91	142.12	72.35	106.60	1.87	314.09	300.64	5.10	223.59	213.34

**Movement, Approach, & Intersection Results**

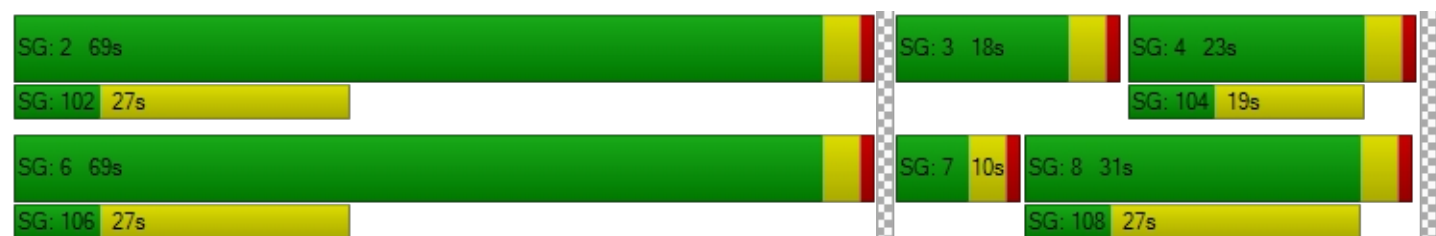
d_M, Delay for Movement [s/veh]	51.89	48.13	56.65	49.74	52.44	52.44	1.31	7.64	7.68	1.39	5.57	5.59
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.84			51.33			7.56			5.43		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.88											
Intersection LOS	B											
Intersection V/C	0.603											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.277			2.052			3.023			3.055		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.880			1.796			3.016			2.813		
Bicycle LOS	A			A			C			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	89.4
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.003

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	122	57	45	95	76	86	390	27	97	279	36
Total Analysis Volume [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	14	37	37	17	39	0	22	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	33	33	8	33	50	13	35	35	18	40	40
g / C, Green / Cycle	0.07	0.30	0.30	0.07	0.30	0.46	0.12	0.32	0.32	0.16	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.09	0.13	0.13	0.05	0.10	0.17	0.10	0.41	0.06	0.22	0.29	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	131	1158	549	242	1144	820	414	1204	570	295	1377	652
d1, Uniform Delay [s]	51.00	30.51	30.47	50.23	29.84	19.61	47.43	37.58	27.32	46.01	31.66	24.30
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.17	0.11	0.20	0.11	0.30	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	94.62	1.13	2.33	4.38	0.77	0.44	4.36	135.80	0.16	154.79	1.19	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.17	0.42	0.42	0.74	0.33	0.37	0.83	1.30	0.19	1.31	0.81	0.22
d, Delay for Lane Group [s/veh]	145.62	31.64	32.80	54.60	30.62	20.05	51.79	173.38	27.48	200.80	32.85	24.47
Lane Group LOS	F	C	C	D	C	C	D	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.05	5.33	5.18	2.56	4.00	5.14	4.84	38.56	2.11	20.66	13.31	2.61
50th-Percentile Queue Length [ft/ln]	176.29	133.15	129.42	63.96	100.09	128.39	121.01	963.92	52.77	516.47	332.80	65.16
95th-Percentile Queue Length [veh/ln]	11.99	9.11	8.91	4.61	7.21	8.85	8.45	56.71	3.80	31.69	19.30	4.69
95th-Percentile Queue Length [ft/ln]	299.87	227.77	222.71	115.13	180.16	221.30	211.22	1417.86	94.99	792.24	482.39	117.29

**Movement, Approach, & Intersection Results**

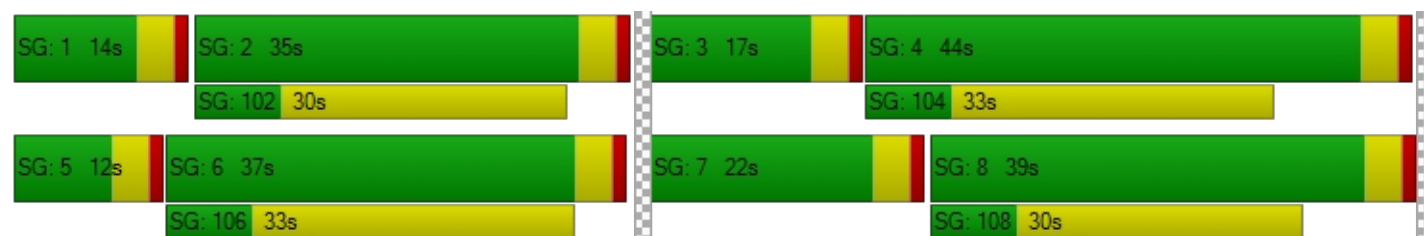
d_M, Delay for Movement [s/veh]	145.62	31.64	32.80	54.60	30.62	20.05	51.79	173.38	27.48	200.80	32.85	24.47
Movement LOS	F	C	C	D	C	C	D	F	C	F	C	C
d_A, Approach Delay [s/veh]	52.10			31.87			144.71			71.63		
Approach LOS	D			C			F			E		
d_I, Intersection Delay [s/veh]	89.43											
Intersection LOS	F											
Intersection V/C	1.003											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.746			2.859			3.103			3.050		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	564			600			636			727		
d_b, Bicycle Delay [s]	28.37			26.95			25.57			22.27		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.270			3.221			2.917		
Bicycle LOS	B			B			C			C		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.000

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	28	9	69	0	344	227	105	306	0
Total Analysis Volume [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	21	0	0	59	0	30	89	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		17	17	55	55	26	85
g / C, Green / Cycle		0.15	0.15	0.50	0.50	0.24	0.77
(v / s)_i Volume / Saturation Flow Rate		0.08	0.15	0.36	0.50	0.23	0.32
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		278	278	1904	902	423	2936
d1, Uniform Delay [s]		42.74	46.45	21.44	27.44	41.97	4.19
k, delay calibration		0.11	0.13	0.50	0.50	0.34	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.51	26.40	2.40	31.33	34.51	0.44
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.52	0.99	0.72	1.01	0.99	0.42
d, Delay for Lane Group [s/veh]		44.25	72.84	23.84	58.77	76.48	4.63
Lane Group LOS		D	E	C	F	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.74	9.55	13.95	30.22	15.27	3.84
50th-Percentile Queue Length [ft/ln]		93.38	238.84	348.79	755.54	381.77	95.91
95th-Percentile Queue Length [veh/ln]		6.72	14.62	20.08	39.42	21.68	6.91
95th-Percentile Queue Length [ft/ln]		168.09	365.56	501.94	985.43	541.99	172.63

**Movement, Approach, & Intersection Results**

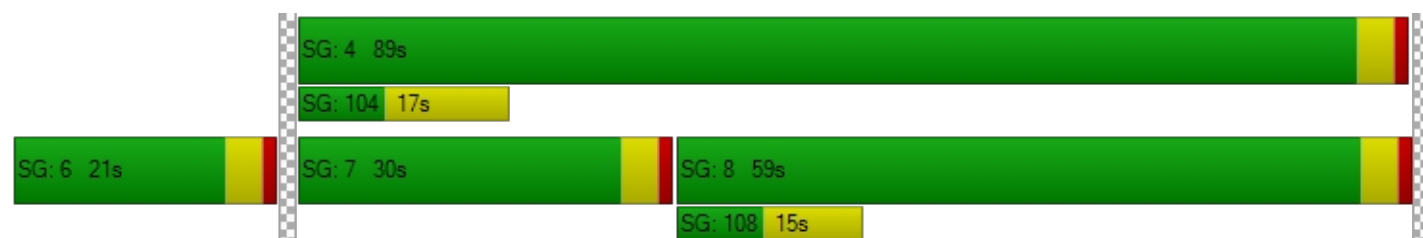
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	44.25	44.25	72.84	0.00	23.84	58.77	76.48	4.63	0.00
Movement LOS				D	D	E		C	F	E	A	
d_A, Approach Delay [s/veh]	0.00			63.02			37.73			23.01		
Approach LOS	A			E			D			C		
d_I, Intersection Delay [s/veh]	34.62											
Intersection LOS	C											
Intersection V/C	1.000											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.760	1.930	0.000	0.000
Crosswalk LOS	C	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	309	1000	1545
d_b, Bicycle Delay [s]	55.00	39.31	13.75	2.84
I_b,int, Bicycle LOS Score for Intersection	4.132	2.256	2.814	2.914
Bicycle LOS	D	B	C	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	47.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	161	0	118	0	0	0	143	241	0	0	256	41
Total Analysis Volume [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	27	0	0	0	0	0	40	83	0	0	43	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23		37	79	38	38
g / C, Green / Cycle	0.21	0.21	0.21		0.34	0.72	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.32	0.25	0.31	0.33
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	377	377	377		609	2728	652	618
d1, Uniform Delay [s]	43.29	43.29	43.29		35.22	5.87	34.52	35.41
k, delay calibration	0.27	0.27	0.27		0.14	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	30.55	30.55	30.55		8.96	0.36	19.14	27.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	0.98	0.98		0.94	0.35	0.91	0.96
d, Delay for Lane Group [s/veh]	73.84	73.84	73.84		44.18	6.23	53.66	63.34
Lane Group LOS	E	E	E		D	A	D	E
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	13.14	13.14	13.14		15.97	3.84	18.31	20.03
50th-Percentile Queue Length [ft/ln]	328.50	328.50	328.50		399.21	96.07	457.86	500.64
95th-Percentile Queue Length [veh/ln]	19.08	19.08	19.08		22.52	6.92	25.33	27.36
95th-Percentile Queue Length [ft/ln]	477.12	477.12	477.12		563.05	172.93	633.33	684.11

**Movement, Approach, & Intersection Results**

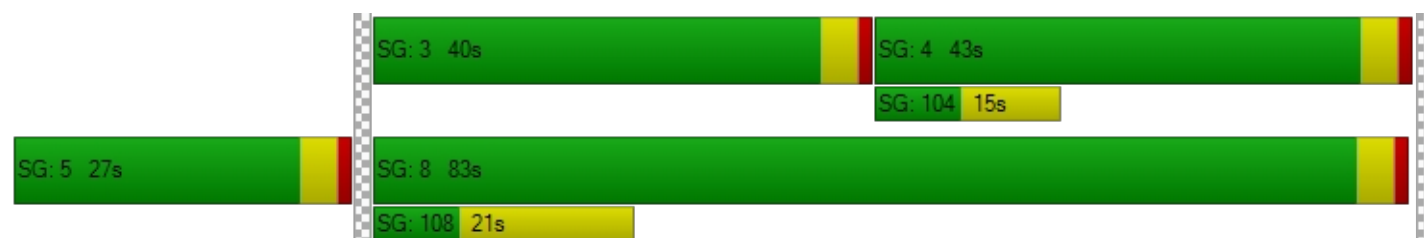
d_M, Delay for Movement [s/veh]	73.84	0.00	73.84	0.00	0.00	0.00	44.18	6.23	0.00	0.00	57.73	63.34
Movement LOS	E		E				D	A			E	E
d_A, Approach Delay [s/veh]	73.84			0.00			20.32			58.50		
Approach LOS	E			A			C			E		
d_I, Intersection Delay [s/veh]	47.67											
Intersection LOS	D											
Intersection V/C	0.957											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	2.148	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1436	709
d_b, Bicycle Delay [s]	55.00	55.00	4.37	22.91
I_b,int, Bicycle LOS Score for Intersection	5.969	4.132	2.826	2.540
Bicycle LOS	F	D	C	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	4.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.383

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	27	654	18	23	1173	13	14	14	33	12	15	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	654	18	23	1173	13	14	14	33	12	15	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	164	5	6	293	3	4	4	8	3	4	5
Total Analysis Volume [veh/h]	27	654	18	23	1173	13	14	14	33	12	15	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.18	0.01	0.32	0.32	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1506	1673	1585	1561	1673	1585	124	125
d1, Uniform Delay [s]	0.79	0.96	0.95	0.79	1.15	1.15	51.72	51.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.28	0.29	0.02	0.62	0.65	3.00	1.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.21	0.21	0.01	0.36	0.36	0.49	0.37
d, Delay for Lane Group [s/veh]	0.82	1.24	1.25	0.81	1.77	1.80	54.73	53.08
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	0.45	0.43	0.02	0.96	0.92	1.76	1.30
50th-Percentile Queue Length [ft/ln]	0.74	11.22	10.69	0.62	24.04	23.02	44.02	32.54
95th-Percentile Queue Length [veh/ln]	0.05	0.81	0.77	0.04	1.73	1.66	3.17	2.34
95th-Percentile Queue Length [ft/ln]	1.34	20.20	19.24	1.12	43.27	41.44	79.23	58.57

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.82	1.24	1.25	0.81	1.78	1.80	54.73	54.73	54.73	53.08	53.08	53.08
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.23			1.76			54.73			53.08		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	4.35											
Intersection LOS	A											
Intersection V/C	0.383											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.700			2.699			1.819			1.806		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.136			2.557			1.660			1.636		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	42.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.946

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	148	1309	133	134	1628	203	210	533	143	160	705	214
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	1309	133	134	1628	203	210	533	143	160	705	214
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	327	33	34	407	51	53	133	36	40	176	54
Total Analysis Volume [veh/h]	148	1309	133	134	1628	203	210	533	143	160	705	214
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	36	0	31	57	0	13	33	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	53	53	63	53	53	39	29	29	39	26	26
g / C, Green / Cycle	0.57	0.48	0.48	0.57	0.48	0.48	0.35	0.26	0.26	0.35	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.08	0.34	0.07	0.07	0.49	0.49	0.12	0.14	0.08	0.09	0.19	0.12
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	263	1832	868	635	915	867	421	997	472	518	894	423
d1, Uniform Delay [s]	10.95	22.51	15.93	10.86	28.51	28.51	25.92	34.81	32.51	25.13	39.50	36.51
k, delay calibration	0.11	0.11	0.11	0.11	0.49	0.49	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.88	0.53	0.08	0.16	36.75	37.55	0.92	2.05	1.65	1.55	7.01	4.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.71	0.15	0.21	1.03	1.03	0.50	0.53	0.30	0.31	0.79	0.51
d, Delay for Lane Group [s/veh]	12.83	23.04	16.02	11.02	65.26	66.07	26.84	36.86	34.15	26.68	46.51	40.78
Lane Group LOS	B	C	B	B	F	F	C	D	C	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.78	13.05	1.88	1.50	32.20	30.70	4.11	6.37	3.27	3.18	9.73	5.47
50th-Percentile Queue Length [ft/ln]	44.45	326.31	46.94	37.55	805.10	767.56	102.73	159.29	81.66	79.47	243.24	136.83
95th-Percentile Queue Length [veh/ln]	3.20	18.98	3.38	2.70	42.43	40.66	7.40	10.51	5.88	5.72	14.84	9.31
95th-Percentile Queue Length [ft/ln]	80.02	474.43	84.49	67.59	1060.68	1016.58	184.92	262.78	147.00	143.05	371.12	232.75

**Movement, Approach, & Intersection Results**

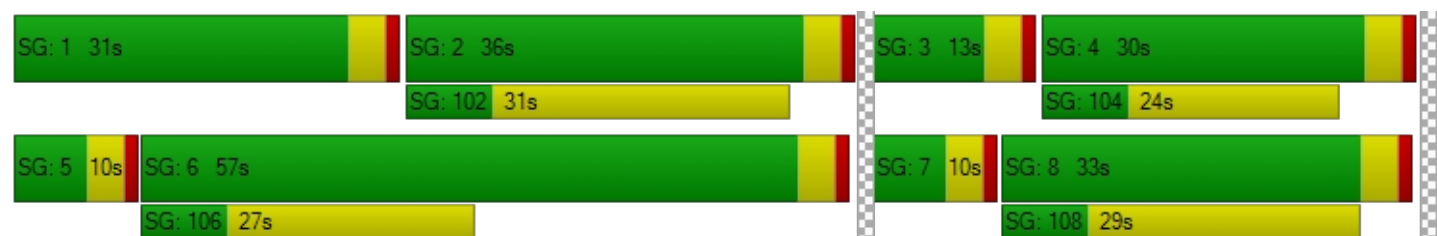
d_M, Delay for Movement [s/veh]	12.83	23.04	16.02	11.02	65.60	66.07	26.84	36.86	34.15	26.68	46.51	40.78
Movement LOS	B	C	B	B	E	E	C	D	C	C	D	D
d_A, Approach Delay [s/veh]	21.50			61.93			34.05			42.43		
Approach LOS	C			E			C			D		
d_I, Intersection Delay [s/veh]	42.00											
Intersection LOS	D											
Intersection V/C	0.946											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.099			3.106			2.883			2.863		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			964			527			473		
d_b, Bicycle Delay [s]	27.65			14.77			29.82			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.871			3.181			2.291			2.450		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	126	558	246	32	1020	108	101	656	116	343	832	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	126	558	246	32	1020	108	101	656	116	343	832	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	140	62	8	255	27	25	164	29	86	208	7
Total Analysis Volume [veh/h]	126	558	246	32	1020	108	101	656	116	343	832	29
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	59	0	11	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	40	40	48	38	38	8	37	37	13	42	42
g / C, Green / Cycle	0.43	0.36	0.36	0.43	0.34	0.34	0.07	0.34	0.34	0.12	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.07	0.15	0.14	0.02	0.31	0.30	0.06	0.17	0.06	0.10	0.22	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	344	1376	652	676	650	615	130	1278	605	424	1464	693
d1, Uniform Delay [s]	18.99	26.25	25.94	17.98	34.54	34.04	50.20	29.31	25.92	47.14	26.64	21.15
k, delay calibration	0.11	0.11	0.11	0.11	0.18	0.16	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	0.19	0.36	0.03	8.03	6.10	9.52	1.48	0.70	3.71	1.61	0.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.41	0.38	0.05	0.91	0.88	0.78	0.51	0.19	0.81	0.57	0.04
d, Delay for Lane Group [s/veh]	19.64	26.44	26.30	18.01	42.58	40.15	59.73	30.79	26.63	50.85	28.25	21.26
Lane Group LOS	B	C	C	B	D	D	E	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.02	5.47	4.80	0.48	16.15	14.32	3.07	7.15	2.27	4.78	8.79	0.49
50th-Percentile Queue Length [ft/ln]	50.50	136.76	120.00	11.90	403.82	357.96	76.78	178.84	56.84	119.49	219.64	12.25
95th-Percentile Queue Length [veh/ln]	3.64	9.31	8.39	0.86	22.74	20.52	5.53	11.54	4.09	8.37	13.65	0.88
95th-Percentile Queue Length [ft/ln]	90.89	232.65	209.82	21.42	568.60	513.10	138.21	288.50	102.32	209.13	341.16	22.05

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	19.64	26.44	26.30	18.01	41.55	40.15	59.73	30.79	26.63	50.85	28.25	21.26
Movement LOS	B	C	C	B	D	D	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	25.48			40.77			33.59			34.52		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	34.05											
Intersection LOS	C											
Intersection V/C	0.737											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.854			2.670			2.842			2.919		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1018			473			473		
d_b, Bicycle Delay [s]	13.75			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.327			2.517			2.280			2.553		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	92	1547	46	143	1846	67	83	140	161	143	154	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	1547	46	143	1846	67	83	140	161	143	154	99
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	387	12	36	462	17	21	35	40	36	39	25
Total Analysis Volume [veh/h]	92	1547	46	143	1846	67	83	140	161	143	154	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	52	0	0	52	0	0	58	0	0	58	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76	76	76	76	26	26	26
g / C, Green / Cycle	0.69	0.69	0.69	0.69	0.69	0.69	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.43	0.43	0.08	0.52	0.52	0.21	0.08	0.14
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	694	1319	1249	862	1319	1249	459	79	420
d1, Uniform Delay [s]	5.42	9.04	9.01	5.58	10.64	10.64	41.06	33.78	37.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.40	2.22	2.31	0.42	3.86	4.06	4.08	373.62	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.62	0.62	0.17	0.74	0.74	0.84	1.81	0.60
d, Delay for Lane Group [s/veh]	5.81	11.26	11.32	6.00	14.50	14.71	45.14	407.40	38.98
Lane Group LOS	A	B	B	A	B	B	D	F	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.70	10.14	9.57	1.10	14.57	13.88	10.54	9.91	6.20
50th-Percentile Queue Length [ft/ln]	17.59	253.62	239.19	27.61	364.34	346.96	263.39	247.85	155.06
95th-Percentile Queue Length [veh/ln]	1.27	15.37	14.64	1.99	20.83	19.99	15.86	17.85	10.29
95th-Percentile Queue Length [ft/ln]	31.66	384.21	366.01	49.70	520.85	499.70	396.47	446.13	257.16

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	5.81	11.29	11.32	6.00	14.60	14.71	45.14	45.14	45.14	407.40	38.98	38.98
Movement LOS	A	B	B	A	B	B	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	10.99			14.00			45.14			172.02		
Approach LOS	B			B			D			F		
d_I, Intersection Delay [s/veh]	29.37											
Intersection LOS	C											
Intersection V/C	0.788											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.261			3.166			2.195			2.389		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			873			982			982		
d_b, Bicycle Delay [s]	17.47			17.47			14.25			14.25		
I_b,int, Bicycle LOS Score for Intersection	2.950			3.256			2.193			2.213		
Bicycle LOS	C			C			B			B		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	177	1004	78	62	1305	156	79	47	166	110	41	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	177	1004	78	62	1305	156	79	47	166	110	41	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	251	20	16	326	39	20	12	42	28	10	12
Total Analysis Volume [veh/h]	177	1004	78	62	1305	156	79	47	166	110	41	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	39	0	0	39	0	0	71	0	0	71	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	82	82	82	82	82	82	20	20
g / C, Green / Cycle	0.75	0.75	0.75	0.75	0.75	0.75	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.10	0.30	0.29	0.03	0.40	0.39	0.16	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1063	1416	1342	1174	1416	1342	369	378
d1, Uniform Delay [s]	3.95	5.06	5.01	3.69	5.93	5.83	43.88	41.36
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.34	0.83	0.85	0.09	1.46	1.46	3.85	1.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.40	0.39	0.05	0.54	0.52	0.79	0.53
d, Delay for Lane Group [s/veh]	4.29	5.89	5.85	3.77	7.40	7.29	47.73	42.51
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.06	4.24	3.90	0.34	6.78	6.17	8.09	5.09
50th-Percentile Queue Length [ft/ln]	26.55	106.01	97.47	8.57	169.53	154.32	202.29	127.25
95th-Percentile Queue Length [veh/ln]	1.91	7.62	7.02	0.62	11.05	10.25	12.76	8.79
95th-Percentile Queue Length [ft/ln]	47.79	190.44	175.44	15.42	276.30	256.19	318.92	219.75

**Movement, Approach, & Intersection Results**

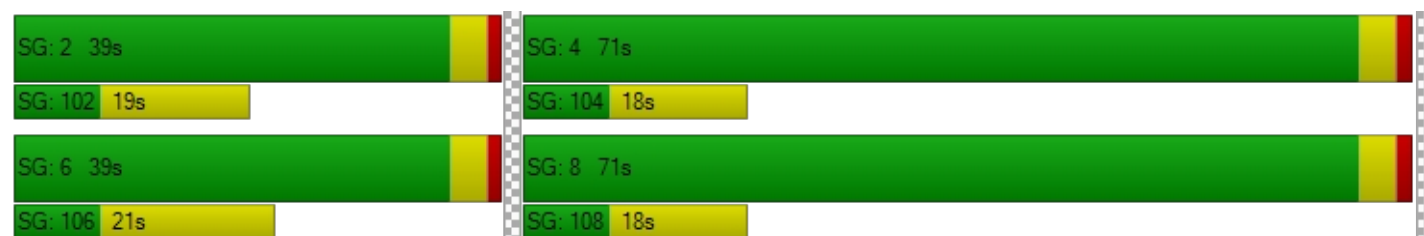
d_M, Delay for Movement [s/veh]	4.29	5.87	5.85	3.77	7.35	7.29	47.73	47.73	47.73	42.51	42.51	42.51
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.65			7.20			47.73			42.51		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.38											
Intersection LOS	B											
Intersection V/C	0.606											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.020			2.940			2.301			2.001		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			636			1218			1218		
d_b, Bicycle Delay [s]	25.57			25.57			8.40			8.40		
I_b,int, Bicycle LOS Score for Intersection	2.598			2.816			2.041			1.890		
Bicycle LOS	B			C			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	91.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.987

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	282	1649	234	227	1739	175	277	853	293	280	1087	258
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	282	1649	234	227	1739	175	277	853	293	280	1087	258
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	412	59	57	435	44	69	213	73	70	272	65
Total Analysis Volume [veh/h]	282	1649	234	227	1739	175	277	853	293	280	1087	258
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	43	0	10	41	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	39	39	6	37	37	16	35	35	14	33	33
g / C, Green / Cycle	0.07	0.35	0.35	0.05	0.34	0.34	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.08	0.43	0.13	0.06	0.41	0.20	0.15	0.15	0.16	0.16	0.19	0.14
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1346	637	191	1277	605	265	1804	570	233	1701	537
d1, Uniform Delay [s]	51.00	35.52	26.37	52.00	36.52	30.36	46.89	30.22	30.70	47.89	33.46	31.61
k, delay calibration	0.11	0.17	0.11	0.11	0.17	0.16	0.13	0.50	0.50	0.14	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	60.89	103.84	0.35	96.15	99.64	1.42	40.31	0.89	3.30	102.13	1.85	3.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.11	1.23	0.37	1.19	1.22	0.60	1.04	0.47	0.51	1.20	0.64	0.48
d, Delay for Lane Group [s/veh]	111.89	139.36	26.72	148.15	136.16	31.77	87.20	31.11	33.99	150.02	35.31	34.66
Lane Group LOS	F	F	C	F	F	C	F	C	C	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.65	36.96	4.59	5.18	34.40	8.12	10.19	6.16	6.81	12.96	8.59	6.04
50th-Percentile Queue Length [ft/ln]	141.18	923.98	114.83	129.44	859.89	203.04	254.80	154.03	170.36	323.96	214.75	150.96
95th-Percentile Queue Length [veh/ln]	9.86	53.36	8.11	9.32	49.70	12.80	15.73	10.23	11.10	20.34	13.40	10.07
95th-Percentile Queue Length [ft/ln]	246.39	1334.04	202.70	232.98	1242.39	319.88	393.33	255.80	277.39	508.56	334.92	251.71

**Movement, Approach, & Intersection Results**

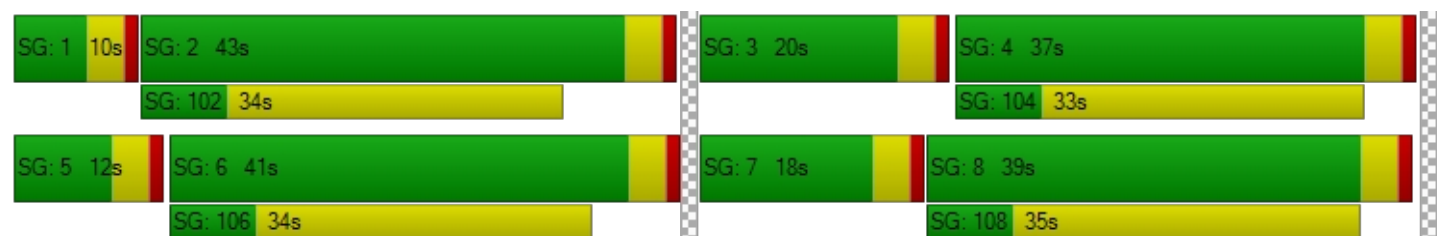
d_M, Delay for Movement [s/veh]	111.89	139.36	26.72	148.15	124.94	31.77	87.20	31.11	33.99	150.02	35.31	34.66
Movement LOS	F	F	C	F	F	C	F	C	C	F	D	C
d_A, Approach Delay [s/veh]	123.61			119.79			42.62			54.97		
Approach LOS	F			F			D			D		
d_I, Intersection Delay [s/veh]	91.66											
Intersection LOS	F											
Intersection V/C	0.987											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.281			3.206			3.097			3.093		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			673			636			600		
d_b, Bicycle Delay [s]	22.91			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.346			2.737			2.342			2.453		
Bicycle LOS	C			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	48.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.978

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	361	1041	106	190	1325	179	200	731	305	279	720	158
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	361	1041	106	190	1325	179	200	731	305	279	720	158
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	260	27	48	331	45	50	183	76	70	180	40
Total Analysis Volume [veh/h]	361	1041	106	190	1325	179	200	731	305	279	720	158
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	39	0	21	38	0	16	38	0	12	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	43	43	56	36	36	12	34	34	8	30	30
g / C, Green / Cycle	0.51	0.39	0.39	0.51	0.33	0.33	0.11	0.31	0.31	0.07	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.20	0.27	0.06	0.11	0.35	0.10	0.11	0.19	0.17	0.08	0.24	0.23
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	425	1494	708	597	1245	590	201	1169	554	263	516	488
d1, Uniform Delay [s]	16.64	27.89	21.52	14.88	36.99	27.62	48.86	32.64	31.74	50.87	38.65	37.91
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.79	0.60	0.10	0.30	33.60	0.29	28.88	2.53	3.91	43.91	21.48	16.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.70	0.15	0.32	1.06	0.30	1.00	0.63	0.55	1.06	0.90	0.85
d, Delay for Lane Group [s/veh]	21.44	28.49	21.62	15.18	70.59	27.90	77.73	35.17	35.65	94.78	60.14	54.30
Lane Group LOS	C	C	C	B	F	C	E	D	D	F	E	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.05	11.34	1.78	2.63	22.14	3.55	7.07	8.67	7.31	5.21	14.99	12.62
50th-Percentile Queue Length [ft/ln]	151.16	283.48	44.53	65.71	553.56	88.87	176.84	216.83	182.64	130.26	374.75	315.40
95th-Percentile Queue Length [veh/ln]	10.08	16.86	3.21	4.73	31.11	6.40	11.44	13.50	11.74	9.13	21.34	18.44
95th-Percentile Queue Length [ft/ln]	251.98	421.54	80.15	118.27	777.83	159.97	285.89	337.58	293.46	228.18	533.48	461.03

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	21.44	28.49	21.62	15.18	70.59	27.90	77.73	35.17	35.65	94.78	58.07	54.30
Movement LOS	C	C	C	B	F	C	E	D	D	F	E	D
d_A, Approach Delay [s/veh]	26.32			59.86			42.17			66.40		
Approach LOS	C			E			D			E		
d_I, Intersection Delay [s/veh]	48.27											
Intersection LOS	D											
Intersection V/C	0.978											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.018			2.965			3.046			3.019		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			618			618			545		
d_b, Bicycle Delay [s]	25.57			26.25			26.25			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.804			2.957			2.239			2.514		
Bicycle LOS	C			C			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	41.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.053

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	525	0	0	460	247	0	0	0	60	142	155
Total Analysis Volume [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50		32	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.48	0.55		0.13	0.15	0.34
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3421	1905	902		576	1216	576
d1, Uniform Delay [s]	45.88	12.66	24.13	24.94		26.65	27.20	34.01
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.65	0.83	14.10	58.53		0.47	0.28	59.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.61	0.97	1.09		0.41	0.47	1.08
d, Delay for Lane Group [s/veh]	48.53	13.49	38.22	83.47		27.13	27.48	93.85
Lane Group LOS	D	B	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.53	9.38	23.30	34.49		4.47	5.40	23.12
50th-Percentile Queue Length [ft/ln]	38.36	234.52	582.43	862.37		111.65	135.09	578.10
95th-Percentile Queue Length [veh/ln]	2.76	14.40	31.21	47.27		7.93	9.22	32.54
95th-Percentile Queue Length [ft/ln]	69.04	360.09	780.32	1181.79		198.30	230.39	813.41

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.53	13.49	0.00	0.00	38.22	83.47	0.00	0.00	0.00	27.13	27.48	93.85
Movement LOS	D	B			D	F				C	C	F
d_A, Approach Delay [s/veh]	15.40			54.01			0.00			56.26		
Approach LOS	B			D			A			E		
d_I, Intersection Delay [s/veh]	41.26											
Intersection LOS	D											
Intersection V/C	1.053											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.537	2.484
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	1000	0	640
d_b, Bicycle Delay [s]	8.00	12.50	50.00	23.12
I_b,int, Bicycle LOS Score for Intersection	2.781	3.114	4.132	2.737
Bicycle LOS	C	C	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	44.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.005

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	228	0	0	352	121	0	0	0	46	173	218
Total Analysis Volume [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	48	0	0	38	0	0	0	0	0	52	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	44	34	34		48	48	48
g / C, Green / Cycle	0.06	0.44	0.34	0.34		0.48	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.05	0.16	0.33	0.35		0.25	0.23	0.48
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2517	1295	613		861	909	861
d1, Uniform Delay [s]	46.44	18.56	32.54	32.97		18.08	17.60	26.08
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	14.53	0.41	19.57	43.80		0.48	0.39	32.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.36	0.97	1.03		0.52	0.47	1.01
d, Delay for Lane Group [s/veh]	60.98	18.97	52.11	76.77		18.57	17.99	58.84
Lane Group LOS	E	B	D	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.67	4.67	18.10	21.82		6.98	6.56	26.96
50th-Percentile Queue Length [ft/ln]	66.69	116.81	452.38	545.56		174.41	164.02	673.93
95th-Percentile Queue Length [veh/ln]	4.80	8.22	25.07	30.05		11.31	10.76	35.80
95th-Percentile Queue Length [ft/ln]	120.05	205.44	626.78	751.35		282.71	269.04	894.92

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	60.98	18.97	0.00	0.00	54.66	76.77	0.00	0.00	0.00	18.57	18.20	58.84
Movement LOS	E	B			D	E				B	B	F
d_A, Approach Delay [s/veh]	22.78			60.33			0.00			38.49		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	43.99											
Intersection LOS	D											
Intersection V/C	1.005											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.338	2.513
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	880	680	0	960
d_b, Bicycle Delay [s]	15.68	21.78	50.00	13.52
I_b,int, Bicycle LOS Score for Intersection	2.111	2.600	4.132	3.002
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	319	71	161	352	0	231	74	40	0	0	0
Total Analysis Volume [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	31	60	0	0	40	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	21	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.21	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.18	0.25	0.26	0.15	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2094	661	737	3523	1057	574	544	
d1, Uniform Delay [s]	25.77	23.76	38.17	9.69	33.12	28.83	26.74	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.32	2.03	3.40	0.34	2.47	0.71	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.61	0.43	0.87	0.40	0.88	0.51	0.29	
d, Delay for Lane Group [s/veh]	27.09	25.79	41.57	10.03	35.59	29.54	27.04	
Lane Group LOS	C	C	D	B	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.29	5.33	7.85	4.93	10.74	5.85	2.94	
50th-Percentile Queue Length [ft/ln]	207.22	133.14	196.23	123.27	268.51	146.37	73.60	
95th-Percentile Queue Length [veh/ln]	13.01	9.11	12.44	8.57	16.11	9.82	5.30	
95th-Percentile Queue Length [ft/ln]	325.25	227.75	311.10	214.31	402.87	245.58	132.48	

**Movement, Approach, & Intersection Results**

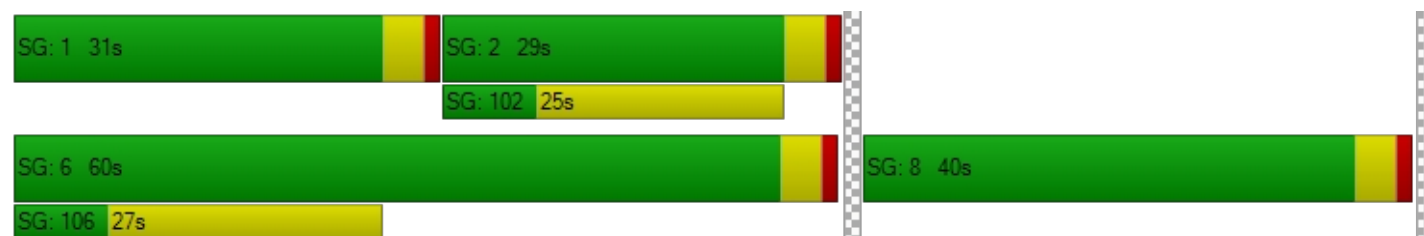
d_M, Delay for Movement [s/veh]	0.00	27.09	25.79	41.57	10.03	0.00	35.59	29.54	27.04	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	C	C			
d_A, Approach Delay [s/veh]	26.86			19.91			33.31			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.78											
Intersection LOS	C											
Intersection V/C	0.763											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.472			2.315		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1120			720			0		
d_b, Bicycle Delay [s]	28.13			9.68			20.48			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.688			3.835			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	184	49	195	219	0	65	231	16	0	0	0
Total Analysis Volume [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	31	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	27	27	25	56	36	36	36	
g / C, Green / Cycle	0.27	0.27	0.25	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.17	0.22	0.23	0.33	0.31	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1035	490	861	2121	651	687	651	
d1, Uniform Delay [s]	31.65	32.00	36.59	12.68	30.49	29.44	21.10	
k, delay calibration	0.50	0.50	0.11	0.50	0.31	0.27	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.57	6.12	3.99	0.59	13.78	7.20	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.63	0.91	0.41	0.92	0.85	0.10	
d, Delay for Lane Group [s/veh]	34.22	38.12	40.57	13.27	44.27	36.63	21.17	
Lane Group LOS	C	D	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.80	7.33	9.54	5.50	15.77	13.94	0.98	
50th-Percentile Queue Length [ft/ln]	169.94	183.28	238.54	137.58	394.25	348.41	24.52	
95th-Percentile Queue Length [veh/ln]	11.07	11.77	14.61	9.35	22.28	20.06	1.77	
95th-Percentile Queue Length [ft/ln]	276.84	294.29	365.19	233.76	557.07	501.47	44.13	

**Movement, Approach, & Intersection Results**

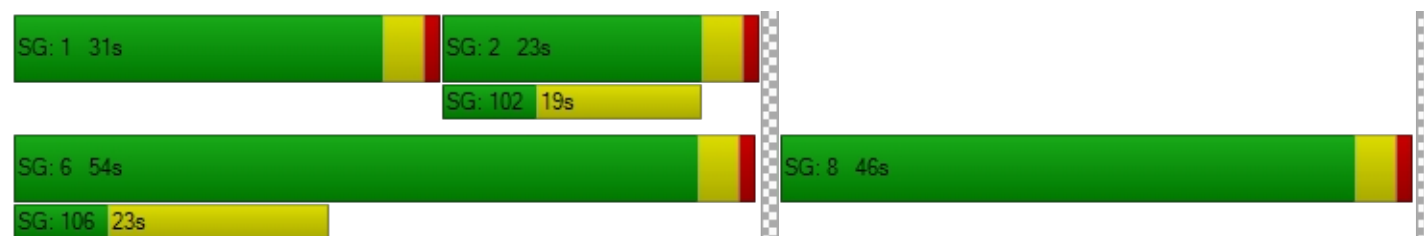
d_M, Delay for Movement [s/veh]	0.00	34.84	38.12	40.57	13.27	0.00	44.27	39.42	21.17	0.00	0.00	0.00
Movement LOS		C	D	D	B		D	D	C			
d_A, Approach Delay [s/veh]	35.52			26.15			39.51			0.00		
Approach LOS	D			C			D			A		
d_I, Intersection Delay [s/veh]	32.77											
Intersection LOS	C											
Intersection V/C	0.826											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.350			2.644		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			1000			840			0		
d_b, Bicycle Delay [s]	32.81			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.072			2.924			2.588			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.333

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	252	282	42	38	475
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	252	282	42	38	475
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	63	71	11	10	119
Total Analysis Volume [veh/h]	0	252	282	42	38	475
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.33	0.00	0.00	0.03	0.00
d_M, Delay for Movement [s/veh]	0.00	12.11	0.00	0.00	8.01	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.46	0.00	0.00	0.10	0.00
95th-Percentile Queue Length [ft/ln]	0.00	36.58	0.00	0.00	2.38	0.00
d_A, Approach Delay [s/veh]	12.11		0.00		0.59	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.08					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	19.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	536	30	5	506	0	2	2	7	443	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	536	30	5	506	0	2	2	7	443	0	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	134	8	1	127	0	1	1	2	111	0	3
Total Analysis Volume [veh/h]	0	536	30	5	506	0	2	2	7	443	0	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	43	0	10	53	0	0	57	0	57	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	68	68	73	73	29	29	29	29
g / C, Green / Cycle	0.62	0.62	0.66	0.66	0.26	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.00	0.13	0.00	0.01	0.25	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1174	1112	1153	2519	507	509	501	476
d1, Uniform Delay [s]	9.45	9.54	6.27	7.21	29.78	29.90	39.46	29.95
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	0.55	0.00	0.18	0.00	0.01	5.40	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.24	0.25	0.00	0.20	0.00	0.02	0.88	0.03
d, Delay for Lane Group [s/veh]	9.93	10.09	6.27	7.39	29.78	29.91	44.86	29.97
Lane Group LOS	A	B	A	A	C	C	D	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.08	3.12	0.04	2.23	0.04	0.18	12.26	0.24
50th-Percentile Queue Length [ft/ln]	76.99	78.00	0.94	55.72	0.99	4.48	306.47	5.98
95th-Percentile Queue Length [veh/ln]	5.54	5.62	0.07	4.01	0.07	0.32	18.00	0.43
95th-Percentile Queue Length [ft/ln]	138.59	140.41	1.70	100.30	1.78	8.06	450.02	10.77

**Movement, Approach, & Intersection Results**

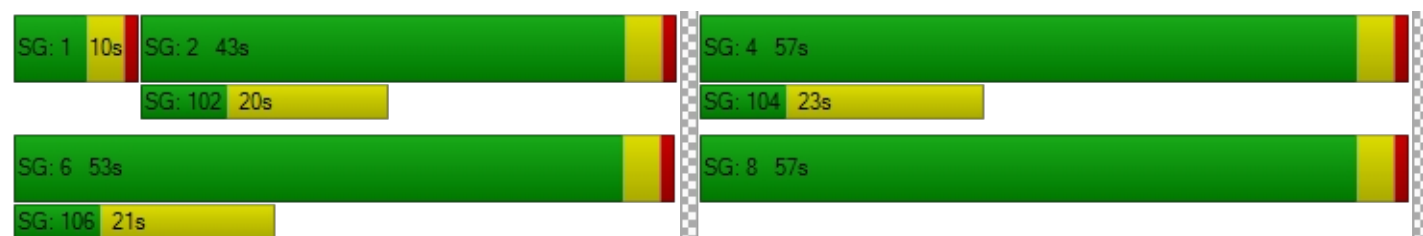
d_M, Delay for Movement [s/veh]	0.00	10.01	10.09	6.27	7.39	0.00	29.78	29.91	29.91	44.86	0.00	29.97
Movement LOS		B	B	A	A		C	C	C	D		C
d_A, Approach Delay [s/veh]	10.01			7.38			29.89			44.46		
Approach LOS	B			A			C			D		
d_I, Intersection Delay [s/veh]	19.44											
Intersection LOS	B											
Intersection V/C	0.454											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.519			1.730			2.114		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			891			964			0		
d_b, Bicycle Delay [s]	22.91			16.91			14.77			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.027			1.981			1.578			4.132		
Bicycle LOS	B			A			A			D		

**Sequence**

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	115.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.453

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	119	231	496	0	203	400
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	231	496	0	203	400
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	58	124	0	51	100
Total Analysis Volume [veh/h]	119	231	496	0	203	400
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.11	0.00	0.00	0.00	0.45	0.70
d_M, Delay for Movement [s/veh]	8.79	0.00	0.00	0.00	115.25	113.49
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.38	0.00	0.00	0.00	20.73	20.73
95th-Percentile Queue Length [ft/ln]	9.38	0.00	0.00	0.00	518.34	518.34
d_A, Approach Delay [s/veh]	2.99		0.00		114.08	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	48.20					
Intersection LOS	F					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	113.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.105

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	345	860	0	0	393
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	345	860	0	0	393
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	86	215	0	0	98
Total Analysis Volume [veh/h]	0	345	860	0	0	393
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	1.11
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	113.18	113.62
Movement LOS		A	A		F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	14.70	14.70
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	367.57	367.57
d_A, Approach Delay [s/veh]	0.00		0.00		113.62	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	27.94					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	330	13	25	1234	12	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	330	13	25	1234	12	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	83	3	6	309	3	6
Total Analysis Volume [veh/h]	330	13	25	1234	12	22
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.02	0.01	0.05	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	8.02	0.00	21.04	10.88
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.06	0.00	0.27	0.27
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.57	0.00	6.67	6.67
d_A, Approach Delay [s/veh]	0.00		0.16		14.47	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.42					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.137

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	6	452	88	0	512	5	0	0	13	0	0	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	452	88	0	512	5	0	0	13	0	0	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	113	22	0	128	1	0	0	3	0	0	25
Total Analysis Volume [veh/h]	6	452	88	0	512	5	0	0	13	0	0	100
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.14
d_M, Delay for Movement [s/veh]	8.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.95	0.00	0.00	10.73
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.47
95th-Percentile Queue Length [ft/ln]	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00	0.00	11.87
d_A, Approach Delay [s/veh]	0.09			0.00			9.95			10.73		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	1.07											
Intersection LOS	B											







*APPENDIX G-VII*

**YEAR 2030 BUILDOUT PLUS PROJECT WITH IMPROVEMENTS  
SATURDAY ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	52.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.882

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	102	52	38	94	82	79	301	24	100	367	34
Total Analysis Volume [veh/h]	169	407	209	153	374	326	317	1205	94	400	1467	134
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	34	0	17	37	37	14	42	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	36	36	7	33	47	10	38	38	13	41	41
g / C, Green / Cycle	0.09	0.33	0.33	0.06	0.30	0.43	0.09	0.34	0.34	0.12	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.09	0.11	0.12	0.04	0.10	0.18	0.09	0.32	0.05	0.11	0.41	0.07
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	3600	3600	1800
c, Capacity [veh/h]	164	1254	594	218	1145	771	318	1308	619	426	1337	669
d1, Uniform Delay [s]	50.00	27.66	27.94	50.59	29.79	21.94	49.98	34.65	24.96	48.11	34.58	23.48
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.20	0.11	0.11	0.11	0.11	0.12	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	41.15	0.69	1.64	4.09	0.76	0.70	22.38	3.20	0.11	10.31	47.26	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.03	0.32	0.35	0.70	0.33	0.42	1.00	0.92	0.15	0.94	1.10	0.20
d, Delay for Lane Group [s/veh]	91.15	28.35	29.58	54.68	30.56	22.63	72.36	37.85	25.08	58.43	81.83	23.63
Lane Group LOS	F	C	C	D	C	C	E	D	C	E	F	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.36	4.13	4.43	2.19	3.96	5.96	5.33	15.70	1.72	6.02	26.12	2.39
50th-Percentile Queue Length [ft/ln]	158.93	103.32	110.83	54.64	98.88	148.99	133.22	392.54	42.98	150.59	652.90	59.69
95th-Percentile Queue Length [veh/ln]	10.61	7.44	7.89	3.93	7.12	9.96	9.11	22.20	3.09	10.05	36.75	4.30
95th-Percentile Queue Length [ft/ln]	265.31	185.97	197.16	98.35	177.99	249.09	227.86	555.01	77.36	251.21	918.67	107.45

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	91.15	28.35	29.58	54.68	30.56	22.63	72.36	37.85	25.08	58.43	81.83	23.63
Movement LOS	F	C	C	D	C	C	E	D	C	E	F	C
d_A, Approach Delay [s/veh]	42.19			31.85			43.87			73.26		
Approach LOS	D			C			D			E		
d_I, Intersection Delay [s/veh]	52.86											
Intersection LOS	D											
Intersection V/C	0.882											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.731			2.842			3.102			3.100		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			691			745		
d_b, Bicycle Delay [s]	29.09			26.95			23.56			21.64		
I_b,int, Bicycle LOS Score for Intersection	2.207			2.263			2.893			3.210		
Bicycle LOS	B			B			C			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	6.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.510

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	553	678	354	2	64	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	553	678	354	2	64	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	138	170	89	1	16	23
Total Analysis Volume [veh/h]	553	678	354	2	64	90
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	45	45	7
g / C, Green / Cycle	0.75	0.75	0.75	0.11
(v / s)_i Volume / Saturation Flow Rate	0.31	0.36	0.20	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	1280	1428	1353	208
d1, Uniform Delay [s]	2.68	2.88	2.31	25.70
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.07	1.13	0.47	5.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.43	0.47	0.26	0.74
d, Delay for Lane Group [s/veh]	3.74	4.02	2.79	30.86
Lane Group LOS	A	A	A	C
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	1.19	1.52	0.63	2.30
50th-Percentile Queue Length [ft/ln]	29.76	38.04	15.74	57.47
95th-Percentile Queue Length [veh/ln]	2.14	2.74	1.13	4.14
95th-Percentile Queue Length [ft/ln]	53.57	68.47	28.33	103.45



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	3.74	4.02	2.79	2.79	30.86	30.86
Movement LOS	A	A	A	A	C	C
d_A, Approach Delay [s/veh]	3.90		2.79		30.86	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	6.05					
Intersection LOS	A					
Intersection V/C	0.510					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	6.164	4.720	4.387
Bicycle LOS	F	E	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX G-VIII*

**YEAR 2030 BUILDOUT PLUS PROJECT WITH IMPROVEMENTS  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.302

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	56	15	16	64	8	5	51	26	43	66	16
Total Analysis Volume [veh/h]	227	225	60	64	256	30	21	202	105	170	262	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	31	0	0	31	0	0	34	0	0	34	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	48	48	48	9	9	9	9	9	9
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.11	0.14	0.03	0.04	0.16	0.01	0.11	0.06	0.09	0.09	0.09
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1251	1379	1316	1261	1316	192	277	263	162	277	263
d1, Uniform Delay [s]	2.63	2.75	2.43	2.44	2.79	24.01	26.55	25.20	26.08	26.09	25.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	0.30	0.07	0.08	0.38	0.25	3.67	0.98	45.53	2.26	2.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.19	0.05	0.05	0.22	0.11	0.73	0.40	1.05	0.62	0.59
d, Delay for Lane Group [s/veh]	2.89	3.05	2.50	2.51	3.17	24.26	30.22	26.18	71.62	28.35	28.04
Lane Group LOS	A	A	A	A	A	C	C	C	F	C	C
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.51	0.71	0.14	0.16	0.80	0.28	3.12	1.47	4.30	2.55	2.27
50th-Percentile Queue Length [ft/ln]	12.66	17.76	3.62	3.90	20.02	7.01	78.08	36.83	107.51	63.71	56.79
95th-Percentile Queue Length [veh/ln]	0.91	1.28	0.26	0.28	1.44	0.50	5.62	2.65	7.74	4.59	4.09
95th-Percentile Queue Length [ft/ln]	22.80	31.96	6.51	7.02	36.03	12.62	140.54	66.30	193.51	114.67	102.22

**Movement, Approach, & Intersection Results**

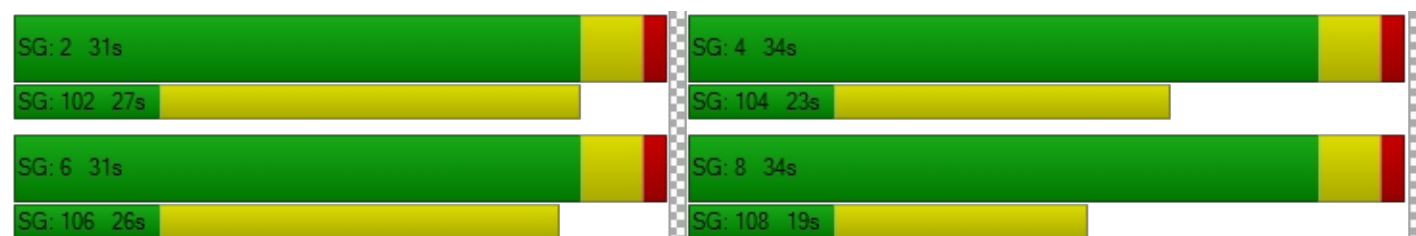
d_M, Delay for Movement [s/veh]	2.89	3.05	2.50	2.51	3.17	3.17	24.26	30.22	26.18	71.62	28.24	28.04
Movement LOS	A	A	A	A	A	A	C	C	C	F	C	C
d_A, Approach Delay [s/veh]	2.93			3.05			28.54			43.08		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	19.75											
Intersection LOS	B											
Intersection V/C	0.302											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.609			2.167			2.819			2.405		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	831			831			923			923		
d_b, Bicycle Delay [s]	11.11			11.11			9.42			9.42		
I_b,int, Bicycle LOS Score for Intersection	2.404			2.137			2.101			1.969		
Bicycle LOS	B			B			B			A		

**Sequence**





Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	52.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.878

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	122	57	45	95	76	86	390	27	97	279	36
Total Analysis Volume [veh/h]	154	488	229	179	378	304	344	1561	109	387	1115	143
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	34	0	16	37	37	17	45	0	15	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	34	34	8	33	63	13	41	41	11	39	39
g / C, Green / Cycle	0.08	0.31	0.31	0.07	0.30	0.57	0.12	0.37	0.37	0.10	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.09	0.13	0.13	0.05	0.10	0.17	0.10	0.41	0.06	0.11	0.31	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	3600	3600	1800
c, Capacity [veh/h]	180	1181	559	244	1135	1024	405	1423	674	358	1291	645
d1, Uniform Delay [s]	50.70	29.98	29.94	50.17	30.05	12.31	47.71	34.40	22.90	49.53	32.79	24.59
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.17	0.11	0.13	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.77	1.07	2.21	4.25	0.79	0.25	5.07	46.86	0.11	47.35	1.86	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.41	0.41	0.73	0.33	0.30	0.85	1.10	0.16	1.08	0.86	0.22
d, Delay for Lane Group [s/veh]	61.46	31.05	32.15	54.42	30.84	12.56	52.78	81.26	23.01	96.88	34.65	24.76
Lane Group LOS	E	C	C	D	C	B	D	F	C	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.78	5.26	5.11	2.55	4.01	3.83	4.89	27.76	1.91	7.25	13.85	2.63
50th-Percentile Queue Length [ft/ln]	119.48	131.48	127.71	63.83	100.35	95.79	122.24	693.89	47.65	181.33	346.17	65.75
95th-Percentile Queue Length [veh/ln]	8.36	9.02	8.82	4.60	7.23	6.90	8.52	38.78	3.43	12.01	19.95	4.73
95th-Percentile Queue Length [ft/ln]	209.11	225.51	220.38	114.90	180.64	172.42	212.90	969.43	85.77	300.25	498.74	118.35

**Movement, Approach, & Intersection Results**

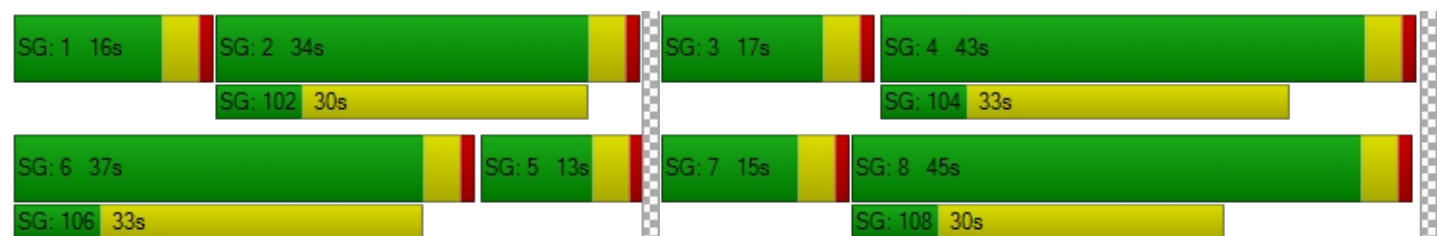
d_M, Delay for Movement [s/veh]	61.46	31.05	32.15	54.42	30.84	12.56	52.78	81.26	23.01	96.88	34.65	24.76
Movement LOS	E	C	C	D	C	B	D	F	C	F	C	C
d_A, Approach Delay [s/veh]	36.71			29.29			73.24			48.43		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	52.75											
Intersection LOS	D											
Intersection V/C	0.878											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.746			2.859			3.322			3.107		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			745			709		
d_b, Bicycle Delay [s]	29.09			26.95			21.64			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.270			3.221			2.917		
Bicycle LOS	B			B			C			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.704

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	119	231	496	0	203	400
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	231	496	0	203	400
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	58	124	0	51	100
Total Analysis Volume [veh/h]	119	231	496	0	203	400
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	23
g / C, Green / Cycle	0.49	0.49	0.49	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.12	0.28	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	592	927	878	683
d1, Uniform Delay [s]	8.46	8.99	10.91	17.45
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.76	0.64	2.62	4.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.20	0.25	0.56	0.88
d, Delay for Lane Group [s/veh]	9.22	9.64	13.53	21.45
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.82	1.59	4.36	7.56
50th-Percentile Queue Length [ft/ln]	20.45	39.86	109.00	188.90
95th-Percentile Queue Length [veh/ln]	1.47	2.87	7.78	12.06
95th-Percentile Queue Length [ft/ln]	36.80	71.74	194.60	301.60

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	9.22	9.64	13.53	13.53	21.45	21.45
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	9.50		13.53		21.45	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	15.85					
Intersection LOS	B					
Intersection V/C	0.704					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.710	4.951	5.127
Bicycle LOS	E	E	F

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.774

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↑		↑		↔	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	0	345	860	0	0	393
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	345	860	0	0	393
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	86	215	0	0	98
Total Analysis Volume [veh/h]	0	345	860	0	0	393
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	C
C, Cycle Length [s]	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	36	16
g / C, Green / Cycle	0.61	0.61	0.26
(v / s)_i Volume / Saturation Flow Rate	0.18	0.45	0.22
s, saturation flow rate [veh/h]	1900	1900	1800
c, Capacity [veh/h]	1152	1152	469
d1, Uniform Delay [s]	5.69	8.51	21.03
k, delay calibration	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	4.43	4.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.30	0.75	0.84
d, Delay for Lane Group [s/veh]	6.36	12.93	25.09
Lane Group LOS	A	B	C
Critical Lane Group	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	1.67	6.83	5.29
50th-Percentile Queue Length [ft/ln]	41.65	170.79	132.20
95th-Percentile Queue Length [veh/ln]	3.00	11.12	9.06
95th-Percentile Queue Length [ft/ln]	74.97	277.96	226.48

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	6.36	12.93	0.00	25.09	25.09
Movement LOS		A	B		C	C
d_A, Approach Delay [s/veh]	6.36		12.93		25.09	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	14.50					
Intersection LOS	B					
Intersection V/C	0.774					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.702	5.551	4.781
Bicycle LOS	E	F	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## APPENDIX H

### EXISTING PLUS PROJECT TRAFFIC CONDITIONS CALTRANS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS




*APPENDIX H-1*

**EXISTING WEEKDAY PM PEAK HOUR  
TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	30	44	52	0	254	130	52	388	0
Total Analysis Volume [veh/h]	0	0	0	120	174	206	0	1014	518	206	1551	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	69	0	0	31	0	10	41	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	63	63	15	81
g / C, Green / Cycle		0.19	0.19	0.57	0.57	0.13	0.74
(v / s)_i Volume / Saturation Flow Rate		0.16	0.11	0.27	0.29	0.11	0.41
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		338	338	2161	1024	241	2809
d1, Uniform Delay [s]		43.33	40.93	13.95	14.36	46.55	6.32
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.81	1.77	0.73	1.79	8.32	0.79
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.61	0.47	0.51	0.85	0.55
d, Delay for Lane Group [s/veh]		50.14	42.70	14.68	16.15	54.87	7.11
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.34	5.27	7.34	7.99	6.04	6.97
50th-Percentile Queue Length [ft/ln]		208.57	131.63	183.47	199.87	151.02	174.26
95th-Percentile Queue Length [veh/ln]		13.08	9.03	11.78	12.63	10.07	11.30
95th-Percentile Queue Length [ft/ln]		327.00	225.71	294.54	315.80	251.79	282.50

**Movement, Approach, & Intersection Results**

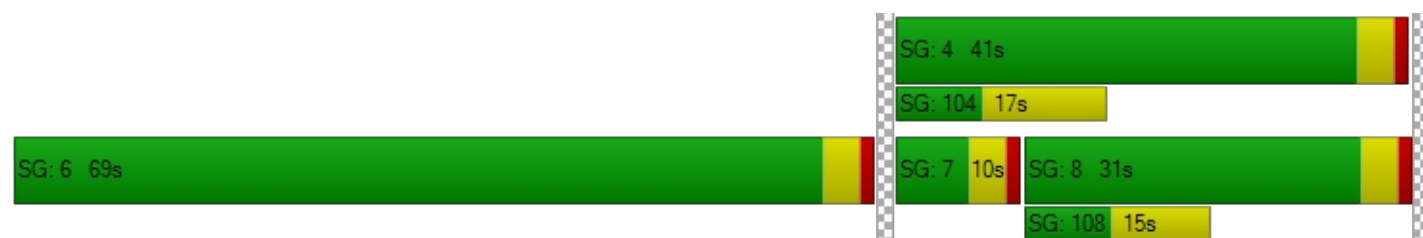
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	50.14	50.14	42.70	0.00	14.68	16.15	54.87	7.11	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			47.08			15.18			12.71		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.24											
Intersection LOS	B											
Intersection V/C	0.641											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.308	1.968	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1182	491	673
d_b, Bicycle Delay [s]	55.00	9.20	31.31	24.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.385	2.402	3.009
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.765

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	155	0	122	0	0	0	36	243	0	0	305	51
Total Analysis Volume [veh/h]	621	0	489	0	0	0	145	973	0	0	1219	205
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	81	0	0	0	0	0	10	29	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.24	0.24	0.24		0.10	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.37	0.40
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	437	437	437		179	2600	1043	988
d1, Uniform Delay [s]	39.67	39.67	39.67		48.53	7.37	17.90	18.52
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.59	4.59	4.59		8.56	0.41	3.62	4.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.81	0.37	0.68	0.72
d, Delay for Lane Group [s/veh]	44.26	44.26	44.26		57.09	7.78	21.53	23.06
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.98	9.98	9.98		4.31	4.57	13.46	14.09
50th-Percentile Queue Length [ft/ln]	249.61	249.61	249.61		107.76	114.30	336.56	352.15
95th-Percentile Queue Length [veh/ln]	15.17	15.17	15.17		7.72	8.08	19.48	20.24
95th-Percentile Queue Length [ft/ln]	379.17	379.17	379.17		192.88	201.97	487.00	506.03

**Movement, Approach, & Intersection Results**

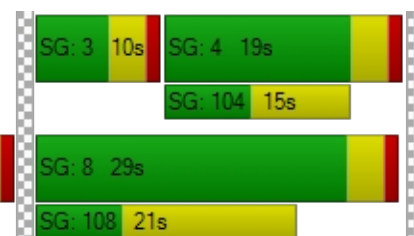
d_M, Delay for Movement [s/veh]	44.26	0.00	44.26	0.00	0.00	0.00	57.09	7.78	0.00	0.00	22.17	23.06
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.26			0.00			14.17			22.30		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.48											
Intersection LOS	C											
Intersection V/C	0.765											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	1.774	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	455	273
d_b, Bicycle Delay [s]	55.00	55.00	32.84	41.02
I_b,int, Bicycle LOS Score for Intersection	5.964	4.132	2.482	2.734
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 22: Harbor Boulevard at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.654

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	476	0	0	348	128	0	0	0	77	95	91
Total Analysis Volume [veh/h]	77	1902	0	0	1391	512	0	0	0	307	380	362
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	68	59	59		24	24	24
g / C, Green / Cycle	0.05	0.68	0.59	0.59		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.33	0.33	0.35		0.17	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3881	2230	1056		431	909	431
d1, Uniform Delay [s]	45.77	7.65	12.81	13.18		34.89	32.16	36.23
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.41	0.45	1.06	2.53		2.21	0.31	4.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.49	0.57	0.60		0.71	0.42	0.84
d, Delay for Lane Group [s/veh]	47.18	8.09	13.87	15.70		37.10	32.46	40.71
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.96	5.85	8.50	9.14		7.02	3.89	8.81
50th-Percentile Queue Length [ft/ln]	23.97	146.32	212.41	228.58		175.47	97.29	220.15
95th-Percentile Queue Length [veh/ln]	1.73	9.82	13.28	14.10		11.36	7.00	13.67
95th-Percentile Queue Length [ft/ln]	43.14	245.50	331.92	352.56		284.09	175.12	341.82

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.18	8.09	0.00	0.00	14.03	15.70	0.00	0.00	0.00	37.10	32.46	40.71
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.61			14.48			0.00			36.67		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.25											
Intersection LOS	B											
Intersection V/C	0.654											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.192			2.392		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.648			2.606			4.132			2.425		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	302	0	0	304	84	0	0	0	42	142	154
Total Analysis Volume [veh/h]	101	1206	0	0	1217	336	0	0	0	167	567	614
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	43	43		38	38	38
g / C, Green / Cycle	0.07	0.54	0.43	0.43		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.27	0.29		0.21	0.19	0.34
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	3087	1637	775		681	719	681
d1, Uniform Delay [s]	45.74	13.33	22.27	22.75		24.33	23.88	29.32
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.37	1.87	4.53		0.68	0.55	9.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.39	0.63	0.67		0.54	0.50	0.90
d, Delay for Lane Group [s/veh]	56.22	13.71	24.15	27.28		25.01	24.43	38.52
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	5.13	9.62	10.36		6.85	6.57	15.14
50th-Percentile Queue Length [ft/ln]	70.64	128.25	240.43	259.06		171.17	164.13	378.58
95th-Percentile Queue Length [veh/ln]	5.09	8.84	14.70	15.64		11.14	10.77	21.52
95th-Percentile Queue Length [ft/ln]	127.15	221.11	367.58	391.04		278.46	269.19	538.12

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.22	13.71	0.00	0.00	24.61	27.28	0.00	0.00	0.00	25.01	24.64	38.52
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	16.99			25.19			0.00			31.01		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.51											
Intersection LOS	C											
Intersection V/C	0.778											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.209			2.383		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.414			4.132			2.672		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 24: Harbor Boulevard at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	336	54	68	369	0	175	72	37	0	0	0
Total Analysis Volume [veh/h]	0	1342	214	272	1474	0	700	288	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	10	68	24	24	24	
g / C, Green / Cycle	0.54	0.54	0.10	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.20	0.15	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3079	972	339	3859	850	462	437	
d1, Uniform Delay [s]	13.83	12.00	44.22	7.03	35.83	33.78	31.19	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.45	0.52	4.42	0.29	2.08	1.39	0.45	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.44	0.22	0.80	0.38	0.82	0.62	0.33	
d, Delay for Lane Group [s/veh]	14.28	12.52	48.64	7.32	37.90	35.17	31.64	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.91	2.54	3.48	4.14	8.18	6.34	2.94	
50th-Percentile Queue Length [ft/ln]	147.75	63.52	87.09	103.39	204.62	158.45	73.44	
95th-Percentile Queue Length [veh/ln]	9.90	4.57	6.27	7.44	12.88	10.47	5.29	
95th-Percentile Queue Length [ft/ln]	247.42	114.34	156.75	186.11	321.92	261.67	132.19	

**Movement, Approach, & Intersection Results**

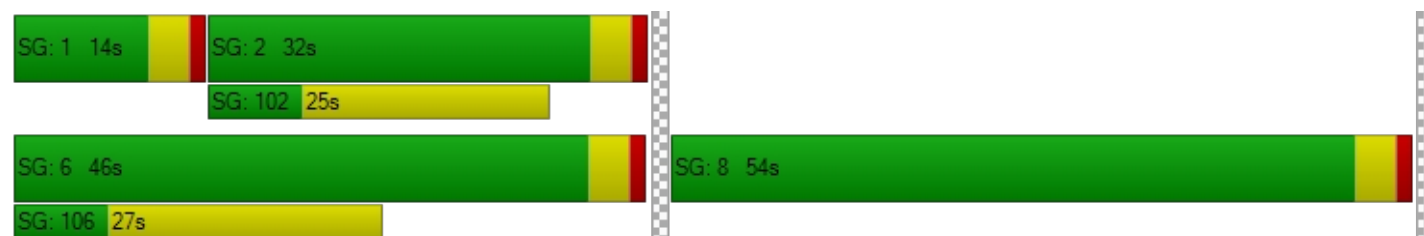
d_M, Delay for Movement [s/veh]	0.00	14.28	12.52	48.64	7.32	0.00	37.90	35.17	31.64	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	14.04			13.76			36.40			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.64											
Intersection LOS	B											
Intersection V/C	0.583											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.412			2.097		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.415			2.520			3.431			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	23.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	246	52	102	236	0	79	104	14	0	0	0
Total Analysis Volume [veh/h]	0	985	209	408	944	0	317	414	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	51	51	14	69	23	23	23	
g / C, Green / Cycle	0.51	0.51	0.14	0.69	0.23	0.23	0.23	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.20	0.19	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1921	910	490	2605	422	445	422	
d1, Uniform Delay [s]	15.46	15.69	41.85	6.57	36.78	36.30	30.27	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.66	1.53	3.74	0.39	5.47	3.83	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.44	0.83	0.36	0.87	0.82	0.14	
d, Delay for Lane Group [s/veh]	16.12	17.22	45.60	6.97	42.25	40.13	30.42	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.64	5.93	5.11	3.81	9.07	8.80	1.10	
50th-Percentile Queue Length [ft/ln]	140.92	148.21	127.65	95.35	226.73	219.94	27.48	
95th-Percentile Queue Length [veh/ln]	9.53	9.92	8.81	6.87	14.01	13.66	1.98	
95th-Percentile Queue Length [ft/ln]	238.27	248.04	220.29	171.63	350.20	341.55	49.46	

**Movement, Approach, & Intersection Results**

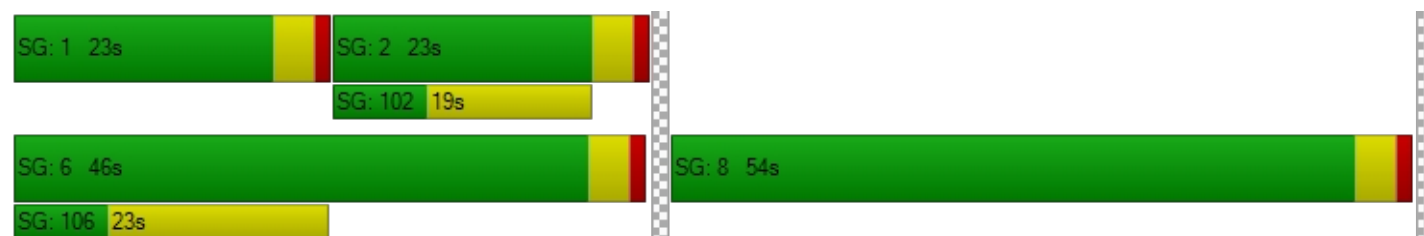
d_M, Delay for Movement [s/veh]	0.00	16.34	17.22	45.60	6.97	0.00	42.25	40.37	30.42	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	16.49			18.62			40.41			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.01											
Intersection LOS	C											
Intersection V/C	0.614											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.201			2.222		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.216			2.675			2.210			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX H-II*

**EXISTING SATURDAY ARRIVAL PEAK HOUR  
TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	29	0	162	107	98	249	0
Total Analysis Volume [veh/h]	0	0	0	92	0	116	0	646	426	391	994	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	19	0	0	19	0	72	91	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	63	63	26	93
g / C, Green / Cycle		0.08	0.08	0.57	0.57	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.05	0.06	0.17	0.24	0.22	0.26
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		150	150	2162	1024	429	3206
d1, Uniform Delay [s]		48.67	49.36	12.31	13.38	40.76	1.82
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.98	8.06	0.35	1.25	7.81	0.25
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.61	0.77	0.30	0.42	0.91	0.31
d, Delay for Lane Group [s/veh]		52.65	57.43	12.66	14.63	48.56	2.07
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.60	3.45	4.11	6.09	11.11	1.38
50th-Percentile Queue Length [ft/ln]		65.04	86.29	102.71	152.34	277.83	34.60
95th-Percentile Queue Length [veh/ln]		4.68	6.21	7.40	10.14	16.58	2.49
95th-Percentile Queue Length [ft/ln]		117.07	155.32	184.88	253.55	414.51	62.28



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.65	52.65	57.43	0.00	12.66	14.63	48.56	2.07	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.31			13.44			15.20		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	17.62											
Intersection LOS	B											
Intersection V/C	0.582											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.230	1.826	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	273	273	1582
d_b, Bicycle Delay [s]	55.00	41.02	41.02	2.40
I_b,int, Bicycle LOS Score for Intersection	4.132	1.903	2.149	2.702
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	0	98	0	0	0	44	154	0	0	222	36
Total Analysis Volume [veh/h]	430	0	393	0	0	0	177	615	0	0	886	142
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	60	0	0	0	0	0	31	50	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21		13	81	64	64
g / C, Green / Cycle	0.19	0.19	0.19		0.12	0.74	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.15		0.10	0.16	0.27	0.29
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	341	341	341		212	2804	1109	1051
d1, Uniform Delay [s]	42.86	42.63	42.39		47.47	4.51	13.06	13.33
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.20	4.49	3.88		8.35	0.18	1.39	1.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.78		0.84	0.22	0.46	0.49
d, Delay for Lane Group [s/veh]	48.06	47.13	46.26		55.82	4.69	14.45	14.96
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.83	7.51	7.19		5.22	1.95	7.36	7.55
50th-Percentile Queue Length [ft/ln]	195.79	187.85	179.66		130.43	48.77	183.93	188.72
95th-Percentile Queue Length [veh/ln]	12.42	12.01	11.58		8.96	3.51	11.81	12.05
95th-Percentile Queue Length [ft/ln]	310.52	300.24	289.58		224.08	87.78	295.14	301.37

**Movement, Approach, & Intersection Results**

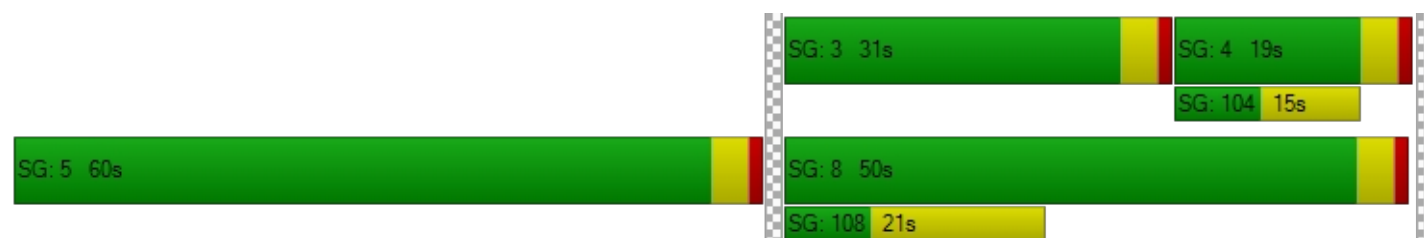
d_M, Delay for Movement [s/veh]	47.73	0.00	46.53	0.00	0.00	0.00	55.82	4.69	0.00	0.00	14.67	14.96
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	47.17			0.00			16.11			14.71		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	25.24											
Intersection LOS	C											
Intersection V/C	0.607											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.217	1.744	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	836	273
d_b, Bicycle Delay [s]	55.00	55.00	18.62	41.02
I_b,int, Bicycle LOS Score for Intersection	5.490	4.132	2.213	2.408
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	396	0	0	342	167	0	0	0	54	87	88
Total Analysis Volume [veh/h]	112	1584	0	0	1366	666	0	0	0	215	348	353
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	69	59	59		23	23	23
g / C, Green / Cycle	0.06	0.69	0.59	0.59		0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.36	0.38		0.12	0.09	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3926	2244	1063		416	879	416
d1, Uniform Delay [s]	45.81	6.71	13.03	13.44		33.56	32.53	36.76
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.31	1.21	2.92		0.99	0.29	4.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.40	0.60	0.64		0.52	0.40	0.85
d, Delay for Lane Group [s/veh]	48.11	7.02	14.24	16.37		34.56	32.82	41.63
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	4.32	9.30	10.07		4.63	3.57	8.67
50th-Percentile Queue Length [ft/ln]	35.31	108.12	232.54	251.74		115.63	89.34	216.86
95th-Percentile Queue Length [veh/ln]	2.54	7.74	14.30	15.27		8.15	6.43	13.50
95th-Percentile Queue Length [ft/ln]	63.56	193.39	357.58	381.84		203.80	160.81	337.61



**Movement, Approach, & Intersection Results**

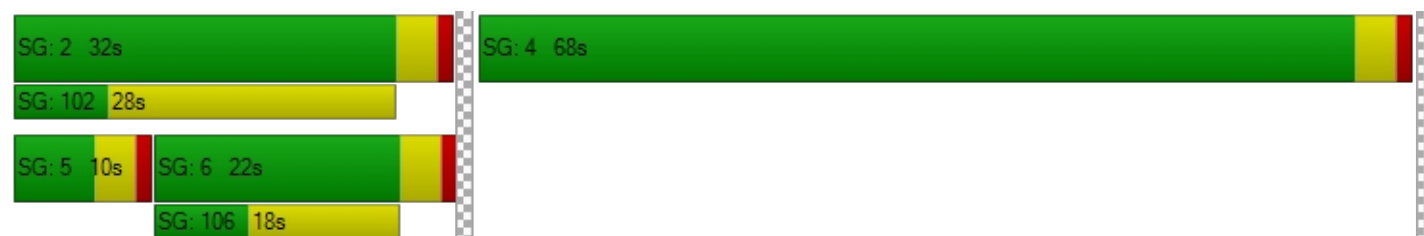
d_M, Delay for Movement [s/veh]	48.11	7.02	0.00	0.00	14.26	16.37	0.00	0.00	0.00	34.56	32.82	41.63
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	9.73			14.95			0.00			36.62		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.32											
Intersection LOS	B											
Intersection V/C	0.687											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.269			2.359		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.492			2.677			4.132			2.315		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.840

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	211	0	0	280	80	0	0	0	33	133	187
Total Analysis Volume [veh/h]	101	843	0	0	1119	321	0	0	0	131	532	749
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	34	0	0	23	0	0	0	0	0	66	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	47	36	36		45	45	45
g / C, Green / Cycle	0.07	0.47	0.36	0.36		0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.25	0.27		0.19	0.17	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	2660	1353	641		816	861	816
d1, Uniform Delay [s]	45.74	16.69	27.76	28.29		18.37	18.06	25.60
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.31	3.18	7.85		0.33	0.28	8.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.32	0.71	0.75		0.41	0.38	0.92
d, Delay for Lane Group [s/veh]	56.22	17.00	30.93	36.13		18.70	18.33	34.57
Lane Group LOS	E	B	C	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	4.01	10.23	11.21		5.15	4.93	17.82
50th-Percentile Queue Length [ft/ln]	70.64	100.28	255.71	280.31		128.77	123.31	445.38
95th-Percentile Queue Length [veh/ln]	5.09	7.22	15.47	16.70		8.87	8.57	24.74
95th-Percentile Queue Length [ft/ln]	127.15	180.51	386.84	417.60		221.82	214.37	618.44

**Movement, Approach, & Intersection Results**

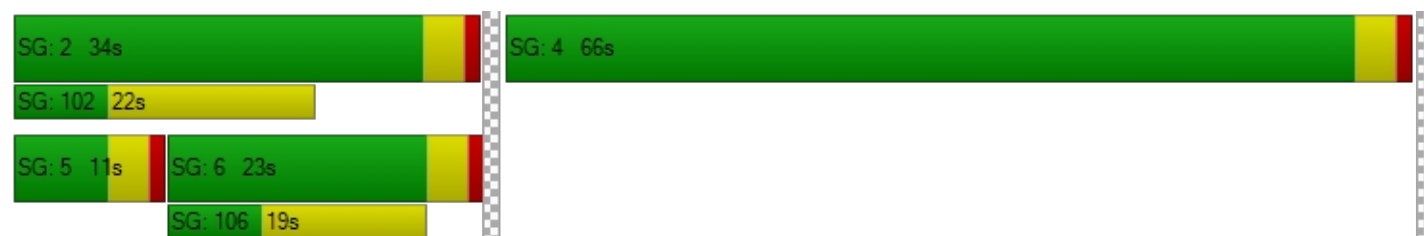
d_M, Delay for Movement [s/veh]	56.22	17.00	0.00	0.00	31.67	36.13	0.00	0.00	0.00	18.70	18.48	34.57
Movement LOS	E	B			C	D				B	B	C
d_A, Approach Delay [s/veh]	21.20			32.67			0.00			27.03		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	27.72											
Intersection LOS	C											
Intersection V/C	0.840											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.185			2.404		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			380			0			1240		
d_b, Bicycle Delay [s]	24.50			32.81			50.00			7.22		
I_b,int, Bicycle LOS Score for Intersection	2.079			2.352			4.132			2.725		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 24: Harbor Boulevard at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	23.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	246	68	122	282	0	203	51	45	0	0	0
Total Analysis Volume [veh/h]	0	985	272	487	1126	0	810	202	179	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	28	57	0	0	43	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	44	44	17	65	27	27	27	
g / C, Green / Cycle	0.44	0.44	0.17	0.65	0.27	0.27	0.27	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.15	0.14	0.20	0.23	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2523	797	578	3693	952	517	490	
d1, Uniform Delay [s]	18.78	18.30	40.48	7.73	34.47	29.64	29.42	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.46	1.17	3.43	0.21	2.25	0.48	0.46	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.39	0.34	0.84	0.30	0.85	0.39	0.37	
d, Delay for Lane Group [s/veh]	19.23	19.46	43.91	7.94	36.72	30.13	29.87	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.11	4.29	6.02	3.30	9.43	3.99	3.51	
50th-Percentile Queue Length [ft/ln]	127.63	107.34	150.49	82.47	235.81	99.69	87.70	
95th-Percentile Queue Length [veh/ln]	8.81	7.69	10.04	5.94	14.47	7.18	6.31	
95th-Percentile Queue Length [ft/ln]	220.27	192.29	251.08	148.45	361.73	179.44	157.86	



**Movement, Approach, & Intersection Results**

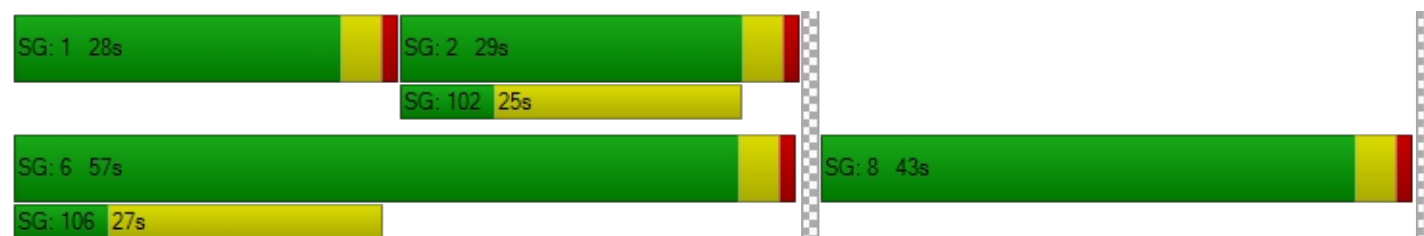
d_M, Delay for Movement [s/veh]	0.00	19.23	19.46	43.91	7.94	0.00	36.72	30.13	29.87	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	19.28			18.80			34.57			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	23.57											
Intersection LOS	C											
Intersection V/C	0.617											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.426			2.188		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1060			780			0		
d_b, Bicycle Delay [s]	28.13			11.05			18.61			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.251			2.447			3.525			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	157	42	147	186	0	47	186	16	0	0	0
Total Analysis Volume [veh/h]	0	627	169	587	745	0	186	744	62	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	40	40	19	63	29	29	29	
g / C, Green / Cycle	0.40	0.40	0.19	0.63	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.17	0.20	0.26	0.24	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1508	714	662	2379	529	559	529	
d1, Uniform Delay [s]	21.15	21.34	39.49	8.70	33.73	32.89	25.81	
k, delay calibration	0.50	0.50	0.11	0.50	0.13	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.48	4.23	0.34	6.03	3.13	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.35	0.37	0.89	0.31	0.89	0.82	0.12	
d, Delay for Lane Group [s/veh]	21.79	22.82	43.72	9.04	39.76	36.03	25.91	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.41	4.61	7.31	3.59	11.52	10.65	1.09	
50th-Percentile Queue Length [ft/ln]	110.32	115.26	182.87	89.77	288.02	266.14	27.21	
95th-Percentile Queue Length [veh/ln]	7.86	8.13	11.75	6.46	17.09	16.00	1.96	
95th-Percentile Queue Length [ft/ln]	196.45	203.29	293.76	161.58	427.19	399.91	48.98	

**Movement, Approach, & Intersection Results**

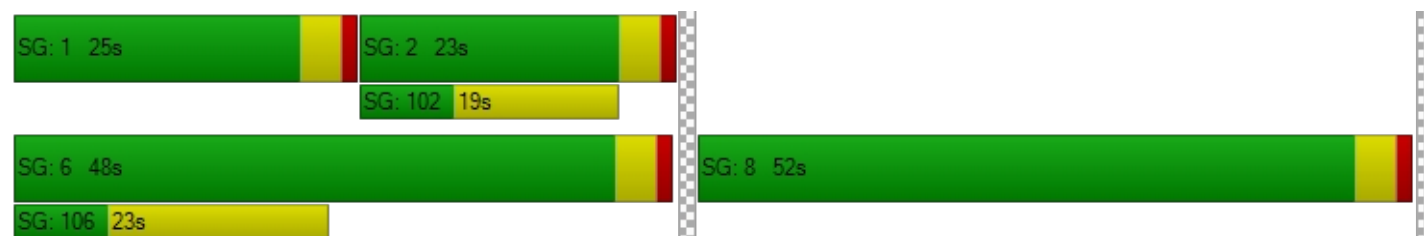
d_M, Delay for Movement [s/veh]	0.00	21.95	22.82	43.72	9.04	0.00	39.76	37.45	25.91	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.14			24.33			37.16			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.85											
Intersection LOS	C											
Intersection V/C	0.655											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.267			2.451		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.997			2.659			2.378			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX H-III*

EXISTING SATURDAY DEPARTURE PEAK HOUR  
TRAFFIC CONDITIONS

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.584

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	0	30	0	165	110	95	214	0
Total Analysis Volume [veh/h]	0	0	0	101	0	119	0	658	438	379	857	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	19	0	68	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	63	63	25	93
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.17	0.24	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		155	155	2178	1031	417	3196
d1, Uniform Delay [s]		48.64	49.16	12.12	13.25	41.13	1.79
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.53	7.66	0.36	1.28	7.84	0.21
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.65	0.77	0.30	0.42	0.91	0.27
d, Delay for Lane Group [s/veh]		53.18	56.83	12.48	14.53	48.97	2.00
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.87	3.52	4.15	6.25	10.79	1.18
50th-Percentile Queue Length [ft/ln]		71.86	88.02	103.76	156.20	269.83	29.55
95th-Percentile Queue Length [veh/ln]		5.17	6.34	7.47	10.35	16.18	2.13
95th-Percentile Queue Length [ft/ln]		129.35	158.43	186.77	258.68	404.53	53.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	53.18	53.18	56.83	0.00	12.48	14.53	48.97	2.00	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.15			13.30			16.40		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	18.41											
Intersection LOS	B											
Intersection V/C	0.584											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.230	1.832	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	273	1509
d_b, Bicycle Delay [s]	55.00	37.64	41.02	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	1.923	2.162	2.579
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.608

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	0	106	0	0	0	50	151	0	0	200	37
Total Analysis Volume [veh/h]	460	0	424	0	0	0	201	603	0	0	800	148
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	66	0	0	0	0	0	25	44	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		14	80	61	61
g / C, Green / Cycle	0.20	0.20	0.20		0.13	0.73	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.16		0.11	0.16	0.25	0.26
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	361	361	361		237	2762	1062	1006
d1, Uniform Delay [s]	42.20	42.05	41.87		46.69	4.87	14.24	14.51
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.05	4.58	4.13		8.27	0.18	1.36	1.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.80		0.85	0.22	0.45	0.47
d, Delay for Lane Group [s/veh]	47.25	46.63	46.00		54.96	5.06	15.60	16.09
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.28	8.06	7.82		5.90	2.03	7.09	7.25
50th-Percentile Queue Length [ft/ln]	206.93	201.43	195.44		147.39	50.68	177.18	181.36
95th-Percentile Queue Length [veh/ln]	13.00	12.71	12.40		9.88	3.65	11.45	11.67
95th-Percentile Queue Length [ft/ln]	324.88	317.81	310.07		246.94	91.22	286.33	291.79

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.03	0.00	46.19	0.00	0.00	0.00	54.96	5.06	0.00	0.00	15.80	16.09
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	46.63			0.00			17.53			15.85		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.69											
Intersection LOS	C											
Intersection V/C	0.608											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.237	1.773	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	727	273
d_b, Bicycle Delay [s]	55.00	55.00	22.27	41.02
I_b,int, Bicycle LOS Score for Intersection	5.591	4.132	2.223	2.342
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 22: Harbor Boulevard at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.754

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	394	0	0	353	157	0	0	0	54	90	114
Total Analysis Volume [veh/h]	110	1577	0	0	1412	628	0	0	0	216	359	457
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.36	0.38		0.12	0.09	0.25
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	203	3593	2022	958		521	1101	521
d1, Uniform Delay [s]	45.80	9.45	17.04	17.59		28.67	27.86	33.81
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.23	0.39	1.81	4.45		0.53	0.17	4.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.44	0.67	0.71		0.41	0.33	0.88
d, Delay for Lane Group [s/veh]	48.03	9.84	18.85	22.03		29.19	28.03	38.67
Lane Group LOS	D	A	B	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.39	5.50	11.20	12.22		4.21	3.37	11.02
50th-Percentile Queue Length [ft/ln]	34.64	137.44	280.04	305.48		105.28	84.14	275.57
95th-Percentile Queue Length [veh/ln]	2.49	9.34	16.69	17.95		7.58	6.06	16.47
95th-Percentile Queue Length [ft/ln]	62.35	233.58	417.26	448.80		189.42	151.45	411.70

**Movement, Approach, & Intersection Results**

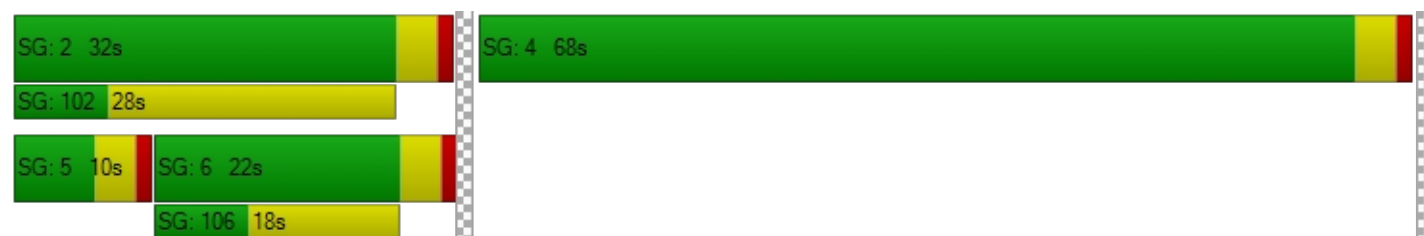
d_M, Delay for Movement [s/veh]	48.03	9.84	0.00	0.00	18.97	22.03	0.00	0.00	0.00	29.19	28.03	38.67
Movement LOS	D	A			B	C				C	C	D
d_A, Approach Delay [s/veh]	12.33			19.91			0.00			32.99		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	20.06											
Intersection LOS	C											
Intersection V/C	0.754											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.254			2.387		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.487			2.682			4.132			2.411		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.756

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	172	0	0	260	71	0	0	0	42	131	168
Total Analysis Volume [veh/h]	83	688	0	0	1041	283	0	0	0	168	523	673
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	51	41	41		41	41	41
g / C, Green / Cycle	0.06	0.51	0.41	0.41		0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.23	0.25		0.19	0.18	0.37
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	107	2892	1549	734		743	784	743
d1, Uniform Delay [s]	46.35	13.80	22.85	23.24		21.41	21.04	27.56
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.10	0.19	1.53	3.63		0.46	0.38	6.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.24	0.57	0.60		0.47	0.44	0.91
d, Delay for Lane Group [s/veh]	57.46	13.99	24.37	26.86		21.87	21.43	34.31
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.35	2.87	8.12	8.67		5.91	5.69	15.83
50th-Percentile Queue Length [ft/ln]	58.85	71.72	203.06	216.66		147.79	142.15	395.78
95th-Percentile Queue Length [veh/ln]	4.24	5.16	12.80	13.49		9.90	9.60	22.36
95th-Percentile Queue Length [ft/ln]	105.94	129.09	319.90	337.36		247.47	239.92	558.91

**Movement, Approach, & Intersection Results**

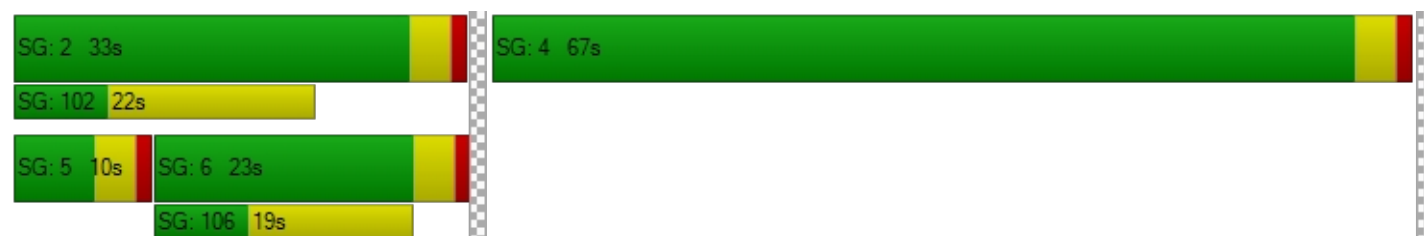
d_M, Delay for Movement [s/veh]	57.46	13.99	0.00	0.00	24.75	26.86	0.00	0.00	0.00	21.87	21.58	34.31
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	18.67			25.20			0.00			27.89		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.81											
Intersection LOS	C											
Intersection V/C	0.756											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.153			2.388		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	1.984			2.288			4.132			2.685		
Bicycle LOS	A			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 24: Harbor Boulevard at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.572

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	249	65	120	281	0	168	57	36	0	0	0
Total Analysis Volume [veh/h]	0	994	258	479	1125	0	672	227	145	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	49	49	16	69	23	23	23	
g / C, Green / Cycle	0.49	0.49	0.16	0.69	0.23	0.23	0.23	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.14	0.14	0.20	0.19	0.12	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2765	873	576	3930	807	438	415	
d1, Uniform Delay [s]	16.06	15.48	40.44	6.01	36.64	33.63	32.20	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.37	0.86	3.21	0.18	2.33	0.95	0.50	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.30	0.83	0.29	0.83	0.52	0.35	
d, Delay for Lane Group [s/veh]	16.43	16.34	43.66	6.19	38.97	34.58	32.70	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.68	3.65	5.90	2.75	7.95	4.88	2.97	
50th-Percentile Queue Length [ft/ln]	116.89	91.19	147.44	68.72	198.78	122.08	74.36	
95th-Percentile Queue Length [veh/ln]	8.22	6.57	9.88	4.95	12.58	8.51	5.35	
95th-Percentile Queue Length [ft/ln]	205.54	164.15	247.01	123.70	314.39	212.68	133.84	

**Movement, Approach, & Intersection Results**

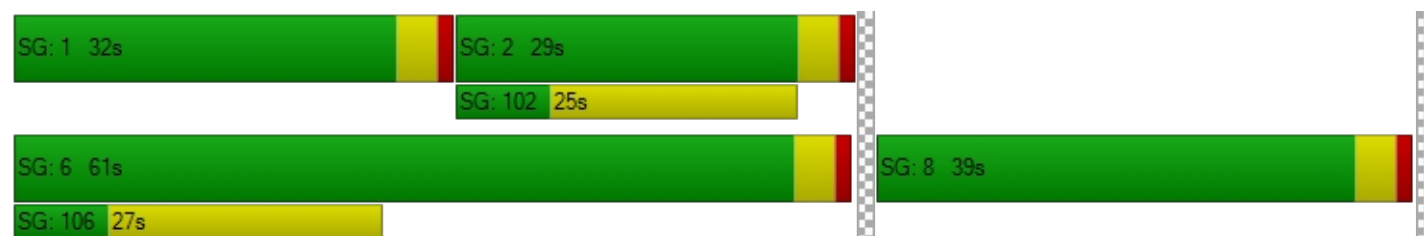
d_M, Delay for Movement [s/veh]	0.00	16.43	16.34	43.66	6.19	0.00	38.97	34.58	32.70	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	16.41			17.38			37.15			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.572											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.390			2.190		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.248			2.442			3.282			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	142	44	140	176	0	49	183	14	0	0	0
Total Analysis Volume [veh/h]	0	568	176	559	705	0	197	733	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	18	63	29	29	29	
g / C, Green / Cycle	0.41	0.41	0.18	0.63	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.16	0.19	0.26	0.24	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1540	730	633	2379	529	558	529	
d1, Uniform Delay [s]	20.34	20.51	39.93	8.58	33.74	32.91	25.75	
k, delay calibration	0.50	0.50	0.11	0.50	0.12	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.55	1.27	4.29	0.32	5.67	3.15	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.32	0.34	0.88	0.30	0.89	0.82	0.11	
d, Delay for Lane Group [s/veh]	20.89	21.77	44.22	8.90	39.40	36.07	25.84	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.01	4.18	6.99	3.35	11.46	10.66	1.00	
50th-Percentile Queue Length [ft/ln]	100.17	104.43	174.69	83.78	286.54	266.47	24.95	
95th-Percentile Queue Length [veh/ln]	7.21	7.52	11.32	6.03	17.01	16.01	1.80	
95th-Percentile Queue Length [ft/ln]	180.31	187.98	283.07	150.80	425.35	400.32	44.91	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	21.00	21.77	44.22	8.90	0.00	39.40	37.31	25.84	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	21.19			24.52			37.06			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.82											
Intersection LOS	C											
Intersection V/C	0.634											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.266			2.435		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.969			2.602			2.374			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX H-IV*

**EXISTING PLUS PROJECT WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	30	44	53	0	254	130	52	390	0
Total Analysis Volume [veh/h]	0	0	0	120	174	211	0	1014	518	206	1560	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



Version 6.00-01

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	69	0	0	31	0	10	41	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	63	63	15	81
g / C, Green / Cycle		0.19	0.19	0.57	0.57	0.13	0.74
(v / s)_i Volume / Saturation Flow Rate		0.16	0.12	0.27	0.29	0.11	0.41
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		339	339	2161	1023	241	2809
d1, Uniform Delay [s]		43.31	41.05	13.96	14.37	46.55	6.35
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.78	1.88	0.73	1.79	8.32	0.80
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.62	0.47	0.51	0.85	0.56
d, Delay for Lane Group [s/veh]		50.09	42.93	14.69	16.16	54.87	7.15
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.34	5.41	7.34	8.00	6.04	7.04
50th-Percentile Queue Length [ft/ln]		208.48	135.37	183.53	199.94	151.02	176.12
95th-Percentile Queue Length [veh/ln]		13.08	9.23	11.78	12.64	10.07	11.40
95th-Percentile Queue Length [ft/ln]		326.88	230.78	294.62	315.89	251.79	284.94

**Movement, Approach, & Intersection Results**

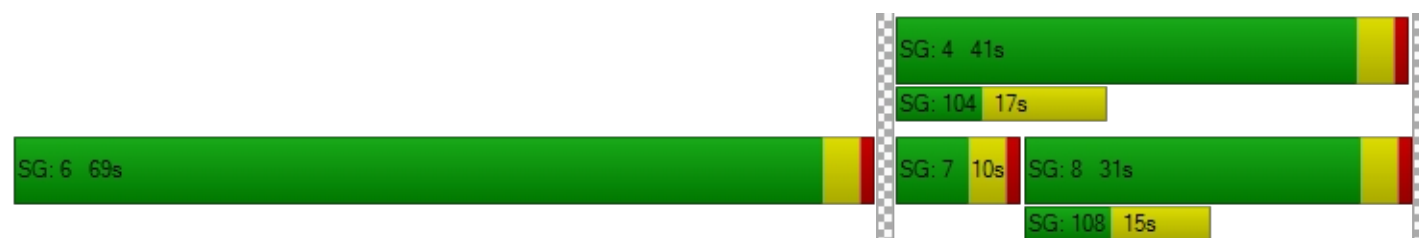
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	50.09	50.09	42.93	0.00	14.69	16.16	54.87	7.15	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			47.10			15.19			12.71		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.28											
Intersection LOS	B											
Intersection V/C	0.644											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.308	1.971	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1182	491	673
d_b, Bicycle Delay [s]	55.00	9.20	31.31	24.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.393	2.402	3.017
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):26.5  
C  
0.767**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	0	122	0	0	0	36	243	0	0	306	51
Total Analysis Volume [veh/h]	624	0	489	0	0	0	145	973	0	0	1224	205
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	81	0	0	0	0	0	10	29	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.24	0.24	0.24		0.10	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.38	0.40
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	438	438	438		179	2598	1042	987
d1, Uniform Delay [s]	39.63	39.63	39.63		48.53	7.39	17.99	18.61
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.58	4.58	4.58		8.56	0.41	3.68	4.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.81	0.37	0.69	0.72
d, Delay for Lane Group [s/veh]	44.22	44.22	44.22		57.09	7.81	21.67	23.23
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.01	10.01	10.01		4.31	4.58	13.57	14.20
50th-Percentile Queue Length [ft/ln]	250.22	250.22	250.22		107.76	114.61	339.21	355.05
95th-Percentile Queue Length [veh/ln]	15.20	15.20	15.20		7.72	8.10	19.61	20.38
95th-Percentile Queue Length [ft/ln]	379.93	379.93	379.93		192.88	202.39	490.23	509.56

**Movement, Approach, & Intersection Results**

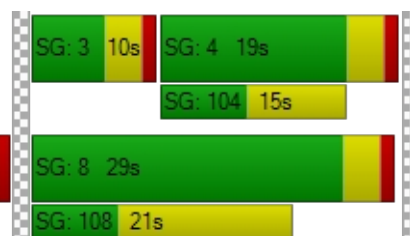
d_M, Delay for Movement [s/veh]	44.22	0.00	44.22	0.00	0.00	0.00	57.09	7.81	0.00	0.00	22.32	23.23
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.22			0.00			14.20			22.45		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.55											
Intersection LOS	C											
Intersection V/C	0.767											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	1.774	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	455	273
d_b, Bicycle Delay [s]	55.00	55.00	32.84	41.02
I_b,int, Bicycle LOS Score for Intersection	5.969	4.132	2.482	2.739
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.654

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	477	0	0	348	128	0	0	0	77	95	91
Total Analysis Volume [veh/h]	77	1908	0	0	1391	512	0	0	0	307	380	362
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	68	59	59		24	24	24
g / C, Green / Cycle	0.05	0.68	0.59	0.59		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.33	0.33	0.35		0.17	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3881	2230	1056		431	909	431
d1, Uniform Delay [s]	45.77	7.66	12.81	13.18		34.89	32.16	36.23
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.41	0.45	1.06	2.53		2.21	0.31	4.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.49	0.57	0.60		0.71	0.42	0.84
d, Delay for Lane Group [s/veh]	47.18	8.11	13.87	15.70		37.10	32.46	40.71
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.96	5.88	8.50	9.14		7.02	3.89	8.81
50th-Percentile Queue Length [ft/ln]	23.97	147.01	212.41	228.58		175.47	97.29	220.15
95th-Percentile Queue Length [veh/ln]	1.73	9.86	13.28	14.10		11.36	7.00	13.67
95th-Percentile Queue Length [ft/ln]	43.14	246.44	331.92	352.56		284.09	175.12	341.82

**Movement, Approach, & Intersection Results**

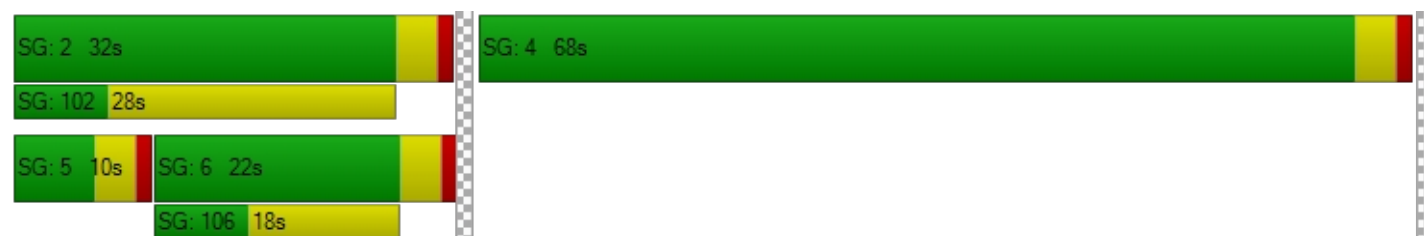
d_M, Delay for Movement [s/veh]	47.18	8.11	0.00	0.00	14.03	15.70	0.00	0.00	0.00	37.10	32.46	40.71
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.62			14.48			0.00			36.67		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.24											
Intersection LOS	B											
Intersection V/C	0.654											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.192			2.392		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.651			2.606			4.132			2.425		
Bicycle LOS	B			B			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	303	0	0	304	84	0	0	0	42	142	154
Total Analysis Volume [veh/h]	101	1213	0	0	1217	336	0	0	0	167	567	617
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	43	43		38	38	38
g / C, Green / Cycle	0.07	0.54	0.43	0.43		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.27	0.29		0.21	0.19	0.34
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	127	3078	1631	772		684	722	684
d1, Uniform Delay [s]	45.74	13.45	22.40	22.87		24.20	23.76	29.24
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	0.38	1.90	4.59		0.67	0.54	9.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.39	0.63	0.67		0.54	0.50	0.90
d, Delay for Lane Group [s/veh]	56.22	13.83	24.30	27.47		24.88	24.30	38.54
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.83	5.19	9.65	10.40		6.83	6.54	15.23
50th-Percentile Queue Length [ft/ln]	70.64	129.78	241.32	260.12		170.64	163.61	380.68
95th-Percentile Queue Length [veh/ln]	5.09	8.93	14.75	15.69		11.11	10.74	21.63
95th-Percentile Queue Length [ft/ln]	127.15	223.19	368.71	392.37		277.75	268.50	540.67

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.22	13.83	0.00	0.00	24.77	27.47	0.00	0.00	0.00	24.88	24.51	38.54
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.08			25.35			0.00			30.96		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.57											
Intersection LOS	C											
Intersection V/C	0.780											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.209	2.384
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	620	0	1000
d_b, Bicycle Delay [s]	16.82	23.81	50.00	12.50
I_b,int, Bicycle LOS Score for Intersection	2.282	2.414	4.132	2.674
Bicycle LOS	B	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	19.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	336	54	68	369	0	176	73	37	0	0	0
Total Analysis Volume [veh/h]	0	1345	214	272	1474	0	703	292	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	54	54	10	68	24	24	24	
g / C, Green / Cycle	0.54	0.54	0.10	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.20	0.15	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3073	971	339	3854	854	463	439	
d1, Uniform Delay [s]	13.90	12.05	44.22	7.08	35.77	33.78	31.11	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.45	0.52	4.42	0.29	2.07	1.42	0.44	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.44	0.22	0.80	0.38	0.82	0.63	0.33	
d, Delay for Lane Group [s/veh]	14.35	12.57	48.64	7.37	37.84	35.19	31.55	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.94	2.55	3.48	4.15	8.22	6.43	2.93	
50th-Percentile Queue Length [ft/ln]	148.60	63.70	87.09	103.86	205.38	160.85	73.32	
95th-Percentile Queue Length [veh/ln]	9.94	4.59	6.27	7.48	12.92	10.59	5.28	
95th-Percentile Queue Length [ft/ln]	248.56	114.66	156.75	186.95	322.90	264.85	131.97	

**Movement, Approach, & Intersection Results**

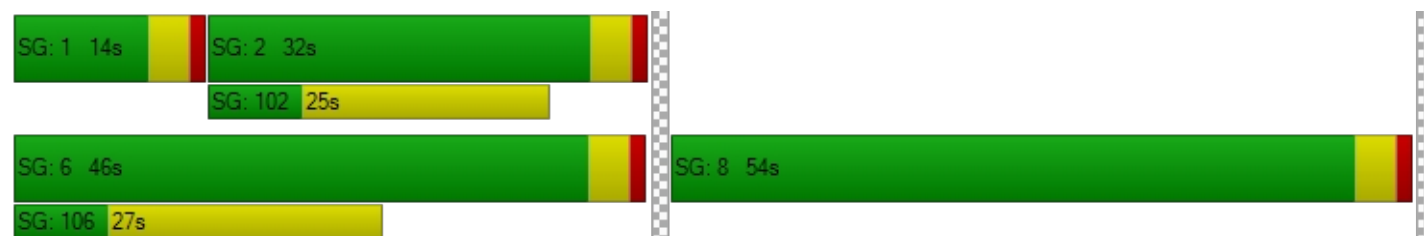
d_M, Delay for Movement [s/veh]	0.00	14.35	12.57	48.64	7.37	0.00	37.84	35.19	31.55	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	14.11			13.80			36.36			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.70											
Intersection LOS	B											
Intersection V/C	0.585											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.414			2.099		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.520			3.442			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.616

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	247	52	102	236	0	80	104	14	0	0	0
Total Analysis Volume [veh/h]	0	988	209	408	944	0	321	414	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.20	0.19	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1917	908	490	2601	424	447	424	
d1, Uniform Delay [s]	15.54	15.78	41.85	6.62	36.72	36.24	30.18	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.67	1.54	3.74	0.39	5.46	3.83	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.42	0.44	0.83	0.36	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.21	17.32	45.60	7.01	42.18	40.07	30.33	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.67	5.97	5.11	3.83	9.11	8.84	1.10	
50th-Percentile Queue Length [ft/ln]	141.79	149.14	127.65	95.85	227.82	221.10	27.43	
95th-Percentile Queue Length [veh/ln]	9.58	9.97	8.81	6.90	14.06	13.72	1.97	
95th-Percentile Queue Length [ft/ln]	239.43	249.28	220.29	172.53	351.59	343.03	49.37	

**Movement, Approach, & Intersection Results**

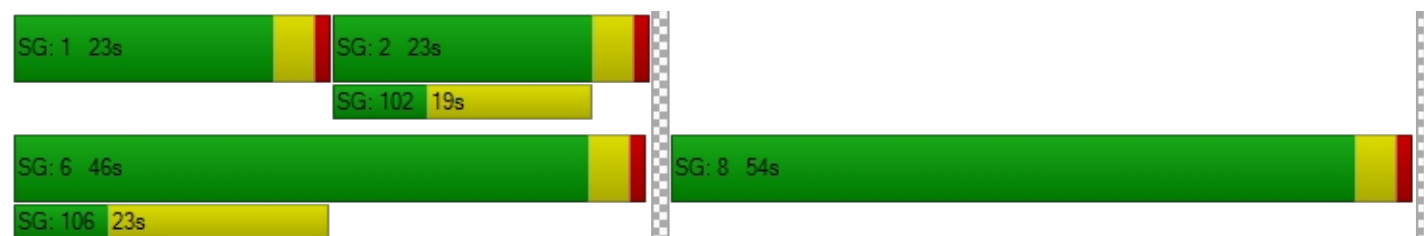
d_M, Delay for Movement [s/veh]	0.00	16.43	17.32	45.60	7.01	0.00	42.18	40.30	30.33	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	16.58			18.66			40.35			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.06											
Intersection LOS	C											
Intersection V/C	0.616											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.202			2.222		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.218			2.675			2.213			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX H-V*



**EXISTING PLUS PROJECT SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	60	0	176	119	98	316	0
Total Analysis Volume [veh/h]	0	0	0	92	0	239	0	702	476	391	1264	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	20	0	0	34	0	56	90	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		16	16	56	56	26	86
g / C, Green / Cycle		0.15	0.15	0.51	0.51	0.24	0.78
(v / s)_i Volume / Saturation Flow Rate		0.05	0.13	0.18	0.26	0.22	0.33
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		262	262	1927	913	429	2970
d1, Uniform Delay [s]		42.30	46.28	16.39	18.17	40.77	3.93
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.80	11.79	0.53	2.13	7.85	0.45
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.35	0.91	0.36	0.52	0.91	0.43
d, Delay for Lane Group [s/veh]		43.10	58.08	16.92	20.29	48.63	4.38
Lane Group LOS		D	E	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.31	7.26	5.38	8.42	11.12	3.77
50th-Percentile Queue Length [ft/ln]		57.74	181.47	134.62	210.45	278.01	94.24
95th-Percentile Queue Length [veh/ln]		4.16	11.68	9.19	13.18	16.59	6.79
95th-Percentile Queue Length [ft/ln]		103.94	291.93	229.76	329.41	414.73	169.63

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	43.10	43.10	58.08	0.00	16.92	20.29	48.63	4.38	0.00
Movement LOS				D	D	E		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			53.91			18.29			14.83		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	20.21											
Intersection LOS	C											
Intersection V/C	0.690											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.278	1.886	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	291	545	1564
d_b, Bicycle Delay [s]	55.00	40.16	29.09	2.62
I_b,int, Bicycle LOS Score for Intersection	4.132	2.106	2.208	2.925
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	154	0	98	0	0	0	53	160	0	0	243	36
Total Analysis Volume [veh/h]	614	0	393	0	0	0	210	638	0	0	972	142
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	59	0	0	0	0	0	32	51	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		15	78	59	59
g / C, Green / Cycle	0.22	0.22	0.22		0.14	0.71	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.12	0.17	0.29	0.31
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	399	399	399		246	2681	1012	959
d1, Uniform Delay [s]	40.94	40.94	40.94		46.41	5.73	16.99	17.39
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.83	4.83	4.83		8.25	0.21	2.15	2.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.84	0.84		0.85	0.24	0.55	0.58
d, Delay for Lane Group [s/veh]	45.77	45.77	45.77		54.66	5.94	19.15	19.96
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.15	9.15	9.15		6.15	2.42	9.59	9.88
50th-Percentile Queue Length [ft/ln]	228.87	228.87	228.87		153.74	60.56	239.65	246.91
95th-Percentile Queue Length [veh/ln]	14.12	14.12	14.12		10.22	4.36	14.66	15.03
95th-Percentile Queue Length [ft/ln]	352.92	352.92	352.92		255.41	109.00	366.60	375.75

**Movement, Approach, & Intersection Results**

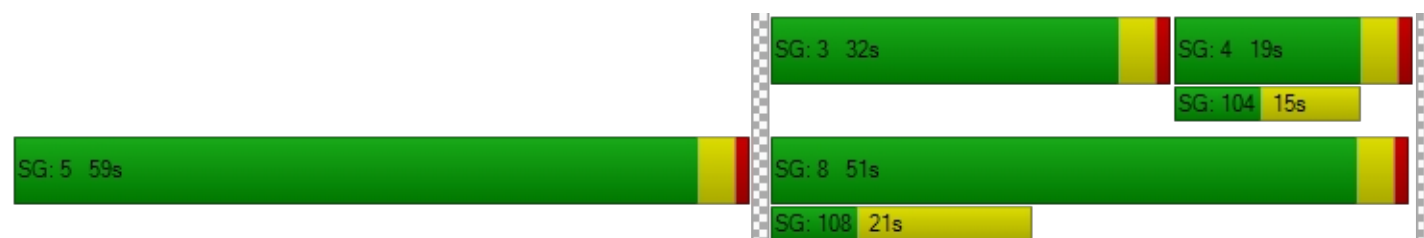
d_M, Delay for Movement [s/veh]	45.77	0.00	45.77	0.00	0.00	0.00	54.66	5.94	0.00	0.00	19.50	19.96
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	45.77			0.00			18.01			19.56		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	28.00											
Intersection LOS	C											
Intersection V/C	0.688											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.277	1.776	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	855	273
d_b, Bicycle Delay [s]	55.00	55.00	18.04	41.02
I_b,int, Bicycle LOS Score for Intersection	5.794	4.132	2.259	2.479
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	427	0	0	345	172	0	0	0	54	95	88
Total Analysis Volume [veh/h]	112	1707	0	0	1379	686	0	0	0	215	378	353
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	69	59	59		23	23	23
g / C, Green / Cycle	0.06	0.69	0.59	0.59		0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.03	0.30	0.36	0.38		0.12	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3922	2241	1062		417	881	417
d1, Uniform Delay [s]	45.81	6.94	13.19	13.62		33.50	32.76	36.70
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.35	1.27	3.07		0.99	0.33	4.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.44	0.61	0.65		0.52	0.43	0.85
d, Delay for Lane Group [s/veh]	48.11	7.30	14.46	16.69		34.49	33.09	41.47
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	4.82	9.57	10.37		4.62	3.91	8.66
50th-Percentile Queue Length [ft/ln]	35.31	120.57	239.15	259.35		115.49	97.83	216.42
95th-Percentile Queue Length [veh/ln]	2.54	8.42	14.64	15.66		8.14	7.04	13.48
95th-Percentile Queue Length [ft/ln]	63.56	210.61	365.96	391.40		203.62	176.10	337.05

**Movement, Approach, & Intersection Results**

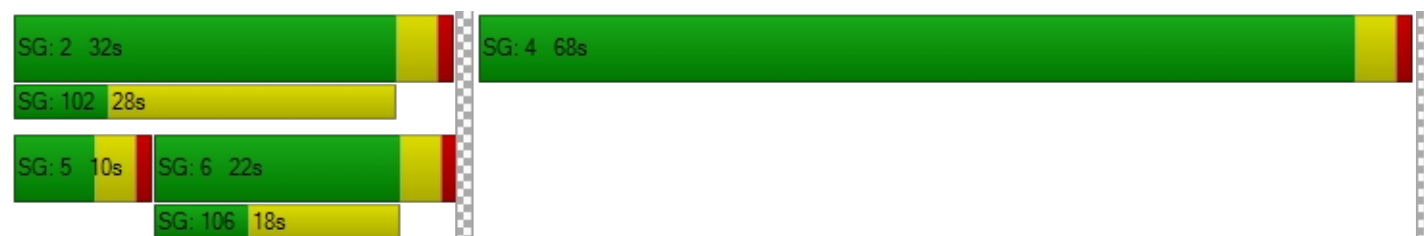
d_M, Delay for Movement [s/veh]	48.11	7.30	0.00	0.00	14.46	16.69	0.00	0.00	0.00	34.49	33.09	41.47
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	9.81			15.20			0.00			36.54		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	17.35											
Intersection LOS	B											
Intersection V/C	0.694											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.293			2.367		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.560			2.695			4.132			2.340		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.882

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	251	0	0	286	88	0	0	0	33	133	200
Total Analysis Volume [veh/h]	101	1003	0	0	1145	351	0	0	0	131	532	798
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	44	34	34		48	48	48
g / C, Green / Cycle	0.06	0.44	0.34	0.34		0.48	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.06	0.18	0.26	0.28		0.19	0.17	0.44
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2508	1289	610		864	912	864
d1, Uniform Delay [s]	46.72	19.02	29.61	30.21		16.63	16.34	24.30
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.25
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	24.46	0.48	4.57	11.54		0.29	0.24	9.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.92	0.40	0.77	0.82		0.39	0.36	0.92
d, Delay for Lane Group [s/veh]	71.18	19.50	34.18	41.74		16.91	16.58	34.14
Lane Group LOS	E	B	C	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.23	5.25	11.27	12.62		4.84	4.63	18.94
50th-Percentile Queue Length [ft/ln]	80.73	131.28	281.80	315.51		121.03	115.78	473.43
95th-Percentile Queue Length [veh/ln]	5.81	9.01	16.78	18.45		8.45	8.16	26.07
95th-Percentile Queue Length [ft/ln]	145.32	225.24	419.45	461.16		211.25	204.02	651.84

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	71.18	19.50	0.00	0.00	35.16	41.74	0.00	0.00	0.00	16.91	16.71	34.14
Movement LOS	E	B			D	D				B	B	C
d_A, Approach Delay [s/veh]	24.23			36.70			0.00			26.25		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	29.55											
Intersection LOS	C											
Intersection V/C	0.882											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.199	2.420
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	2.167	2.382	4.132	2.765
Bicycle LOS	B	B	D	C

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	259	68	122	285	0	221	78	45	0	0	0
Total Analysis Volume [veh/h]	0	1034	272	487	1139	0	884	313	179	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	42	42	16	62	30	30	30	
g / C, Green / Cycle	0.42	0.42	0.16	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.25	0.16	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2392	755	576	3558	1035	562	532	
d1, Uniform Delay [s]	20.57	19.84	40.54	8.82	33.18	29.69	27.54	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.57	1.33	3.51	0.24	2.13	0.87	0.37	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.36	0.85	0.32	0.85	0.56	0.34	
d, Delay for Lane Group [s/veh]	21.15	21.18	44.04	9.06	35.31	30.56	27.91	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.70	4.52	6.03	3.66	10.17	6.39	3.37	
50th-Percentile Queue Length [ft/ln]	142.47	113.01	150.74	91.55	254.25	159.64	84.25	
95th-Percentile Queue Length [veh/ln]	9.61	8.01	10.06	6.59	15.40	10.53	6.07	
95th-Percentile Queue Length [ft/ln]	240.35	200.19	251.42	164.80	385.00	263.25	151.65	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	21.15	21.18	44.04	9.06	0.00	35.31	30.56	27.91	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	21.15			19.54			33.27			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	24.41											
Intersection LOS	C											
Intersection V/C	0.651											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.471			2.242		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.454			3.830			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	169	42	150	190	0	74	186	16	0	0	0
Total Analysis Volume [veh/h]	0	676	169	600	758	0	297	744	62	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	36	36	19	60	32	32	32	
g / C, Green / Cycle	0.36	0.36	0.19	0.60	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.17	0.20	0.29	0.27	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1378	653	673	2261	585	617	585	
d1, Uniform Delay [s]	23.84	24.08	39.36	10.24	32.15	31.31	23.60	
k, delay calibration	0.50	0.50	0.11	0.50	0.17	0.14	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.90	2.08	4.34	0.40	7.81	4.08	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.43	0.89	0.34	0.90	0.84	0.11	
d, Delay for Lane Group [s/veh]	24.74	26.15	43.70	10.64	39.96	35.39	23.68	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.07	5.32	7.48	4.09	12.99	11.98	1.03	
50th-Percentile Queue Length [ft/ln]	126.80	133.09	187.12	102.13	324.87	299.40	25.80	
95th-Percentile Queue Length [veh/ln]	8.77	9.11	11.97	7.35	18.91	17.65	1.86	
95th-Percentile Queue Length [ft/ln]	219.13	227.70	299.29	183.83	472.67	441.29	46.43	

**Movement, Approach, & Intersection Results**

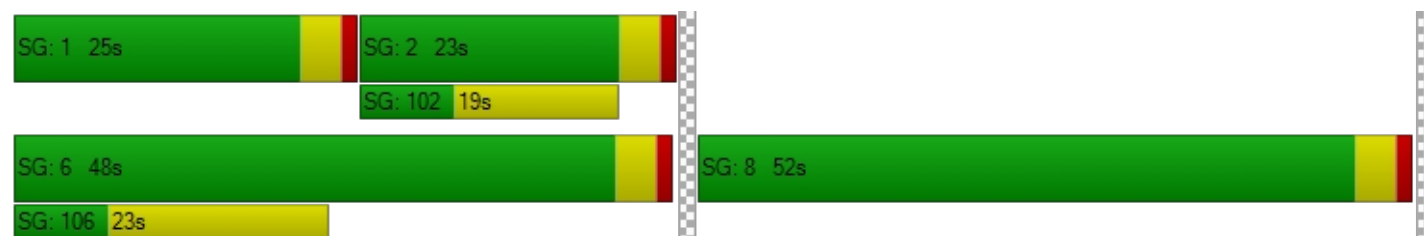
d_M, Delay for Movement [s/veh]	0.00	24.98	26.15	43.70	10.64	0.00	39.96	36.78	23.68	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	25.21			25.25			36.90			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.13											
Intersection LOS	C											
Intersection V/C	0.703											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.304			2.457		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.024			2.680			2.470			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







*APPENDIX H-VI*

**EXISTING PLUS PROJECT SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.735

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	0	33	0	230	167	95	222	0
Total Analysis Volume [veh/h]	0	0	0	101	0	133	0	918	667	379	888	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	14	0	0	19	0	77	96	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	63	63	25	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.24	0.37	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		163	163	2160	1023	417	3179
d1, Uniform Delay [s]		48.16	49.08	13.50	16.27	41.13	1.92
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.76	9.35	0.61	3.23	7.84	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.62	0.81	0.42	0.65	0.91	0.28
d, Delay for Lane Group [s/veh]		51.93	58.43	14.11	19.49	48.97	2.14
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.84	4.00	6.42	11.83	10.79	1.32
50th-Percentile Queue Length [ft/ln]		70.88	100.00	160.43	295.75	269.84	32.99
95th-Percentile Queue Length [veh/ln]		5.10	7.20	10.57	17.47	16.18	2.38
95th-Percentile Queue Length [ft/ln]		127.58	180.00	264.29	436.77	404.54	59.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	51.93	51.93	58.43	0.00	14.11	19.49	48.97	2.14	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.62			16.38			16.15		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	19.26											
Intersection LOS	B											
Intersection V/C	0.735											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.453			1.838			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			182			273			1673		
d_b, Bicycle Delay [s]	55.00			45.45			41.02			1.47		
I_b,int, Bicycle LOS Score for Intersection	4.132			1.946			2.431			2.605		
Bicycle LOS	D			A			B			B		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	120	0	106	0	0	0	89	178	0	0	203	37
Total Analysis Volume [veh/h]	481	0	424	0	0	0	354	710	0	0	810	148
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	55	0	0	0	0	0	36	55	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		24	80	52	52
g / C, Green / Cycle	0.20	0.20	0.20		0.22	0.72	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.16		0.20	0.19	0.25	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	367	367	367		392	2749	892	845
d1, Uniform Delay [s]	42.00	41.89	41.73		41.91	5.17	20.68	21.08
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.02	4.67	4.27		7.92	0.23	2.31	2.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.81		0.90	0.26	0.54	0.57
d, Delay for Lane Group [s/veh]	47.02	46.56	46.00		49.83	5.40	23.00	23.83
Lane Group LOS	D	D	D		D	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.42	8.26	8.05		10.12	2.52	9.11	9.34
50th-Percentile Queue Length [ft/ln]	210.58	206.49	201.22		253.10	62.93	227.68	233.54
95th-Percentile Queue Length [veh/ln]	13.18	12.97	12.70		15.34	4.53	14.06	14.35
95th-Percentile Queue Length [ft/ln]	329.58	324.32	317.54		383.56	113.27	351.41	358.86



**Movement, Approach, & Intersection Results**

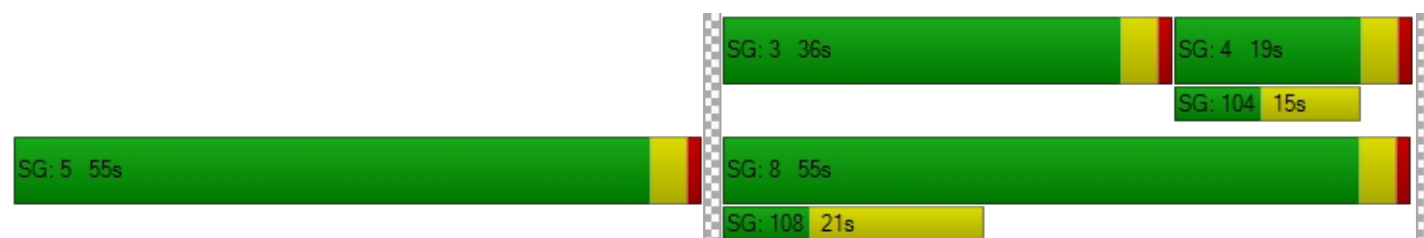
d_M, Delay for Movement [s/veh]	46.85	0.00	46.17	0.00	0.00	0.00	49.83	5.40	0.00	0.00	23.34	23.83
Movement LOS	D		D				D	A			C	C
d_A, Approach Delay [s/veh]	46.53			0.00			20.18			23.41		
Approach LOS	D			A			C			C		
d_I, Intersection Delay [s/veh]	29.39											
Intersection LOS	C											
Intersection V/C	0.710											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.244	1.922	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	927	273
d_b, Bicycle Delay [s]	55.00	55.00	15.82	41.02
I_b,int, Bicycle LOS Score for Intersection	5.626	4.132	2.437	2.350
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	398	0	0	368	180	0	0	0	54	124	114
Total Analysis Volume [veh/h]	110	1591	0	0	1473	720	0	0	0	216	497	457
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.28	0.38	0.41		0.12	0.13	0.25
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	203	3574	2010	952		527	1113	527
d1, Uniform Delay [s]	45.80	9.65	18.03	18.68		28.41	28.76	33.50
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.23	0.40	2.34	5.92		0.51	0.28	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.54	0.45	0.73	0.77		0.41	0.45	0.87
d, Delay for Lane Group [s/veh]	48.03	10.05	20.38	24.60		28.92	29.04	37.97
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.39	5.63	12.76	14.11		4.19	4.83	10.92
50th-Percentile Queue Length [ft/ln]	34.64	140.84	318.99	352.64		104.70	120.85	272.93
95th-Percentile Queue Length [veh/ln]	2.49	9.53	18.62	20.26		7.54	8.44	16.34
95th-Percentile Queue Length [ft/ln]	62.35	238.15	465.45	506.62		188.45	211.00	408.40

**Movement, Approach, & Intersection Results**

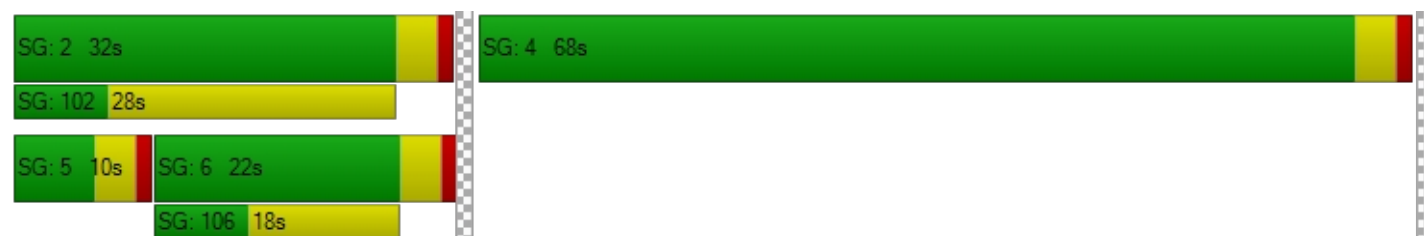
d_M, Delay for Movement [s/veh]	48.03	10.05	0.00	0.00	20.41	24.60	0.00	0.00	0.00	28.92	29.04	37.97
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	12.51			21.79			0.00			32.50		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	21.15											
Intersection LOS	C											
Intersection V/C	0.786											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.367			2.421		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.495			2.766			4.132			2.525		
Bicycle LOS	B			C			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.814

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	177	0	0	291	105	0	0	0	42	131	170
Total Analysis Volume [veh/h]	83	706	0	0	1163	421	0	0	0	168	523	679
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.28	0.29		0.19	0.18	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	107	2874	1537	728		749	790	749
d1, Uniform Delay [s]	46.35	14.03	24.56	25.10		21.17	20.81	27.40
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.10	0.20	2.53	6.21		0.45	0.38	6.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.69	0.73		0.47	0.43	0.91
d, Delay for Lane Group [s/veh]	57.46	14.24	27.09	31.31		21.62	21.18	34.29
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.35	2.98	10.52	11.46		5.87	5.65	15.98
50th-Percentile Queue Length [ft/ln]	58.85	74.49	262.99	286.38		146.77	141.16	399.49
95th-Percentile Queue Length [veh/ln]	4.24	5.36	15.84	17.01		9.84	9.54	22.54
95th-Percentile Queue Length [ft/ln]	105.94	134.08	395.97	425.14		246.11	238.58	563.38



**Movement, Approach, & Intersection Results**

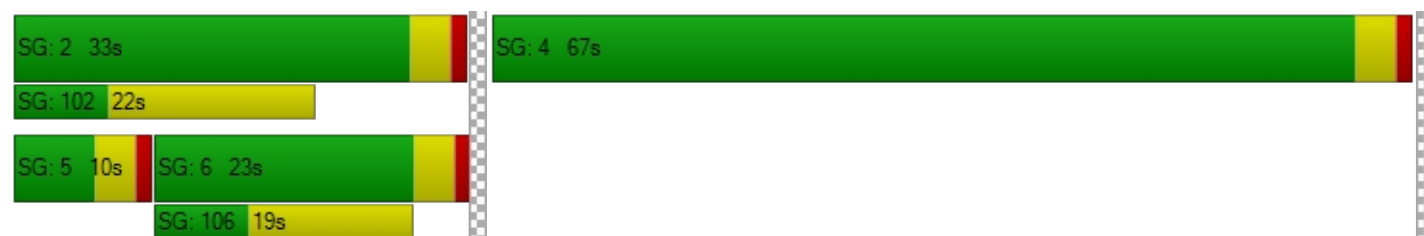
d_M, Delay for Movement [s/veh]	57.46	14.24	0.00	0.00	27.47	31.31	0.00	0.00	0.00	21.62	21.33	34.29
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	18.78			28.49			0.00			27.79		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	26.19											
Intersection LOS	C											
Intersection V/C	0.814											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.220			2.390		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	1.994			2.431			4.132			2.690		
Bicycle LOS	A			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	250	65	120	297	0	170	60	36	0	0	0
Total Analysis Volume [veh/h]	0	1000	258	479	1186	0	680	240	145	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	19	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	49	49	15	68	24	24	24	
g / C, Green / Cycle	0.49	0.49	0.15	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.14	0.14	0.21	0.19	0.13	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2815	889	527	3901	825	448	424	
d1, Uniform Delay [s]	15.54	14.95	41.80	6.29	36.26	33.44	31.78	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.35	0.83	6.39	0.20	2.16	1.00	0.48	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.29	0.91	0.30	0.82	0.54	0.34	
d, Delay for Lane Group [s/veh]	15.89	15.78	48.19	6.49	38.42	34.44	32.25	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.61	3.57	6.22	3.01	7.99	5.16	2.95	
50th-Percentile Queue Length [ft/ln]	115.16	89.19	155.42	75.24	199.76	129.12	73.75	
95th-Percentile Queue Length [veh/ln]	8.13	6.42	10.31	5.42	12.63	8.89	5.31	
95th-Percentile Queue Length [ft/ln]	203.16	160.54	257.64	135.43	315.66	222.30	132.74	

**Movement, Approach, & Intersection Results**

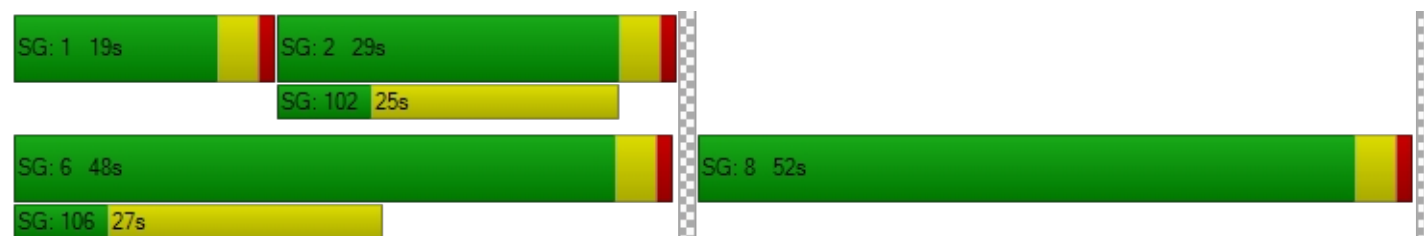
d_M, Delay for Movement [s/veh]	0.00	15.89	15.78	48.19	6.49	0.00	38.42	34.44	32.25	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	15.87			18.49			36.68			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.52											
Intersection LOS	C											
Intersection V/C	0.576											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.396			2.196		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			880			960			0		
d_b, Bicycle Delay [s]	28.13			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.252			2.475			3.317			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	144	44	155	192	0	53	183	14	0	0	0
Total Analysis Volume [veh/h]	0	574	176	620	766	0	210	733	57	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	27	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	38	38	20	62	30	30	30	
g / C, Green / Cycle	0.38	0.38	0.20	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.18	0.20	0.26	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1454	689	701	2367	535	565	535	
d1, Uniform Delay [s]	21.95	22.14	38.86	8.91	33.58	32.76	25.51	
k, delay calibration	0.50	0.50	0.11	0.50	0.15	0.12	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.48	3.94	0.36	7.03	3.45	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.34	0.36	0.88	0.32	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	22.60	23.62	42.81	9.27	40.62	36.21	25.60	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.24	4.42	7.67	3.76	11.81	10.85	0.99	
50th-Percentile Queue Length [ft/ln]	105.93	110.62	191.68	94.02	295.24	271.24	24.81	
95th-Percentile Queue Length [veh/ln]	7.61	7.87	12.21	6.77	17.45	16.25	1.79	
95th-Percentile Queue Length [ft/ln]	190.33	196.86	305.21	169.24	436.14	406.28	44.66	



**Movement, Approach, & Intersection Results**

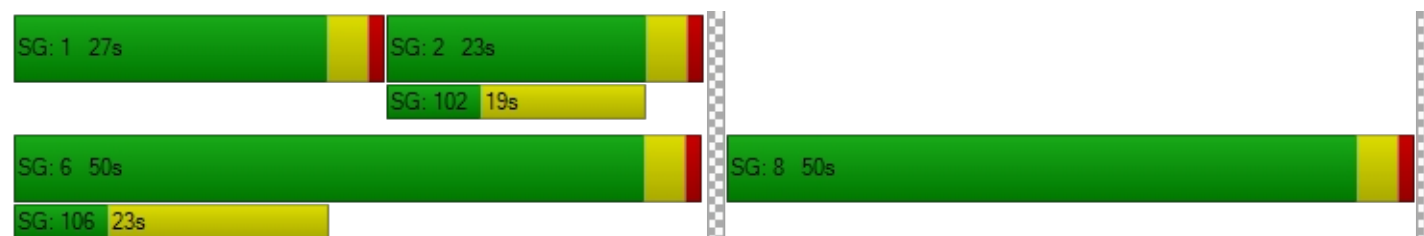
d_M, Delay for Movement [s/veh]	0.00	22.73	23.62	42.81	9.27	0.00	40.62	37.81	25.60	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.94			24.27			37.70			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.23											
Intersection LOS	C											
Intersection V/C	0.660											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.270			2.465		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			920			920			0		
d_b, Bicycle Delay [s]	32.81			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.972			2.703			2.385			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## APPENDIX I

### YEAR 2020 CUMULATIVE TRAFFIC CONDITIONS CALTRANS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS



*APPENDIX I-I*

**YEAR 2020 CUMULATIVE WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	31	44	53	0	260	132	52	398	0
Total Analysis Volume [veh/h]	0	0	0	122	177	212	0	1038	527	209	1593	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	70	0	0	30	0	10	40	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	62	62	15	81
g / C, Green / Cycle		0.19	0.19	0.56	0.56	0.14	0.74
(v / s)_i Volume / Saturation Flow Rate		0.17	0.12	0.27	0.29	0.12	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		344	344	2143	1015	244	2798
d1, Uniform Delay [s]		43.16	40.79	14.38	14.77	46.46	6.58
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.78	1.80	0.79	1.90	8.31	0.85
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.62	0.48	0.52	0.85	0.57
d, Delay for Lane Group [s/veh]		49.93	42.60	15.16	16.67	54.77	7.43
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.47	5.42	7.69	8.31	6.13	7.43
50th-Percentile Queue Length [ft/ln]		211.86	135.45	192.14	207.78	153.13	185.65
95th-Percentile Queue Length [veh/ln]		13.25	9.24	12.23	13.04	10.18	11.90
95th-Percentile Queue Length [ft/ln]		331.22	230.88	305.80	325.98	254.60	297.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	49.93	49.93	42.60	0.00	15.16	16.67	54.77	7.43	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			46.89			15.67			12.92		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.51											
Intersection LOS	B											
Intersection V/C	0.657											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.323			1.974			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			1200			473			655		
d_b, Bicycle Delay [s]	55.00			8.80			32.07			24.89		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.403			2.420			3.046		
Bicycle LOS	D			B			B			C		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	158	0	124	0	0	0	37	249	0	0	314	52
Total Analysis Volume [veh/h]	632	0	496	0	0	0	149	995	0	0	1254	208
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	80	0	0	0	0	0	10	30	0	0	20	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.25	0.25	0.25		0.10	0.68	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.38	0.41
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	444	444	444		183	2587	1031	977
d1, Uniform Delay [s]	39.45	39.45	39.45		48.39	7.60	18.68	19.35
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.55	4.55	4.55		8.53	0.43	4.12	5.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.82	0.38	0.71	0.75
d, Delay for Lane Group [s/veh]	44.01	44.01	44.01		56.92	8.03	22.80	24.59
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.13	10.13	10.13		4.42	4.79	14.35	15.06
50th-Percentile Queue Length [ft/ln]	253.22	253.22	253.22		110.60	119.74	358.73	376.58
95th-Percentile Queue Length [veh/ln]	15.35	15.35	15.35		7.87	8.38	20.56	21.43
95th-Percentile Queue Length [ft/ln]	383.71	383.71	383.71		196.84	209.47	514.04	535.71

**Movement, Approach, & Intersection Results**

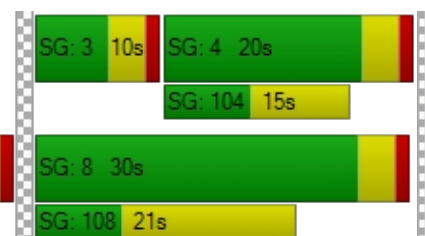
d_M, Delay for Movement [s/veh]	44.01	0.00	44.01	0.00	0.00	0.00	56.92	8.03	0.00	0.00	23.55	24.59
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	44.01			0.00			14.40			23.69		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	26.98											
Intersection LOS	C											
Intersection V/C	0.783											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.316	1.781	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	473	291
d_b, Bicycle Delay [s]	55.00	55.00	32.07	40.16
I_b,int, Bicycle LOS Score for Intersection	5.994	4.132	2.503	2.766
Bicycle LOS	F	D	B	C

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	494	0	0	358	132	0	0	0	78	97	95
Total Analysis Volume [veh/h]	78	1974	0	0	1431	526	0	0	0	312	388	379
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	67	58	58		25	25	25
g / C, Green / Cycle	0.05	0.67	0.58	0.58		0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.35	0.34	0.36		0.17	0.10	0.21
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3825	2192	1038		448	946	448
d1, Uniform Delay [s]	45.76	8.28	13.63	14.04		34.11	31.41	35.72
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.43	0.50	1.20	2.88		1.96	0.29	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.52	0.60	0.63		0.70	0.41	0.85
d, Delay for Lane Group [s/veh]	47.19	8.78	14.83	16.92		36.07	31.69	40.18
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.97	6.47	9.16	9.89		7.03	3.92	9.19
50th-Percentile Queue Length [ft/ln]	24.28	161.86	229.07	247.29		175.72	98.04	229.65
95th-Percentile Queue Length [veh/ln]	1.75	10.65	14.13	15.05		11.38	7.06	14.16
95th-Percentile Queue Length [ft/ln]	43.71	266.19	353.18	376.24		284.41	176.47	353.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.19	8.78	0.00	0.00	15.02	16.92	0.00	0.00	0.00	36.07	31.69	40.18
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	10.24			15.53			0.00			35.94		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.73											
Intersection LOS	B											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.203			2.399		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.688			2.636			4.132			2.450		
Bicycle LOS	B			B			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	307	0	0	310	86	0	0	0	43	147	156
Total Analysis Volume [veh/h]	103	1229	0	0	1238	343	0	0	0	170	588	625
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	54	42	42		38	38	38
g / C, Green / Cycle	0.07	0.54	0.42	0.42		0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.28	0.29		0.21	0.20	0.35
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	3051	1613	764		693	731	693
d1, Uniform Delay [s]	45.79	13.77	22.93	23.43		24.05	23.58	29.00
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.40	2.08	5.06		0.69	0.56	9.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.40	0.65	0.69		0.55	0.51	0.90
d, Delay for Lane Group [s/veh]	57.11	14.17	25.00	28.48		24.74	24.14	38.47
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.35	10.01	10.83		7.05	6.75	15.42
50th-Percentile Queue Length [ft/ln]	72.68	133.71	250.35	270.75		176.25	168.66	385.62
95th-Percentile Queue Length [veh/ln]	5.23	9.14	15.20	16.23		11.40	11.01	21.87
95th-Percentile Queue Length [ft/ln]	130.82	228.54	380.10	405.68		285.11	275.16	546.64

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.11	14.17	0.00	0.00	25.52	28.48	0.00	0.00	0.00	24.74	24.36	38.47
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.49			26.16			0.00			30.78		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.96											
Intersection LOS	C											
Intersection V/C	0.792											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.224			2.395		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.292			2.429			4.132			2.701		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	349	54	71	377	0	181	74	37	0	0	0
Total Analysis Volume [veh/h]	0	1394	217	282	1509	0	722	295	148	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	10	67	25	25	25	
g / C, Green / Cycle	0.53	0.53	0.10	0.67	0.25	0.25	0.25	
(v / s)_i Volume / Saturation Flow Rate	0.24	0.12	0.08	0.26	0.21	0.16	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3025	955	348	3820	874	475	450	
d1, Uniform Delay [s]	14.57	12.52	44.10	7.39	35.46	33.32	30.67	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	0.55	4.52	0.31	2.06	1.34	0.42	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.23	0.81	0.39	0.83	0.62	0.33	
d, Delay for Lane Group [s/veh]	15.08	13.07	48.62	7.70	37.52	34.65	31.09	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.38	2.65	3.61	4.40	8.42	6.45	2.95	
50th-Percentile Queue Length [ft/ln]	159.53	66.24	90.34	110.04	210.43	161.18	73.72	
95th-Percentile Queue Length [veh/ln]	10.52	4.77	6.50	7.84	13.18	10.61	5.31	
95th-Percentile Queue Length [ft/ln]	263.10	119.23	162.61	196.06	329.38	265.28	132.69	

**Movement, Approach, & Intersection Results**

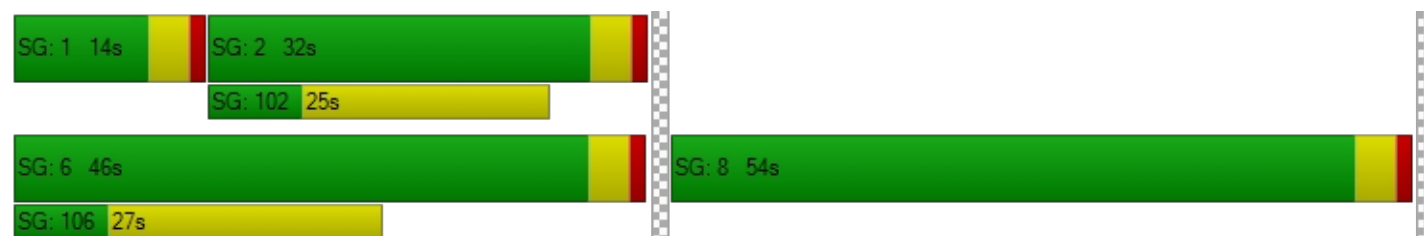
d_M, Delay for Movement [s/veh]	0.00	15.08	13.07	48.62	7.70	0.00	37.52	34.65	31.09	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	14.81			14.15			35.98			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	19.95											
Intersection LOS	B											
Intersection V/C	0.604											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.420			2.107		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.446			2.545			3.482			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	251	53	104	240	0	81	107	15	0	0	0
Total Analysis Volume [veh/h]	0	1002	212	415	959	0	325	426	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.22	0.12	0.25	0.21	0.20	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1892	896	497	2584	432	456	432	
d1, Uniform Delay [s]	16.02	16.27	41.76	6.85	36.48	35.99	29.83	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.71	1.64	3.76	0.41	5.44	3.79	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.45	0.83	0.37	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.73	17.91	45.52	7.26	41.91	39.78	29.97	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.87	6.18	5.19	4.00	9.29	9.01	1.11	
50th-Percentile Queue Length [ft/ln]	146.83	154.57	129.81	100.01	232.37	225.37	27.72	
95th-Percentile Queue Length [veh/ln]	9.85	10.26	8.93	7.20	14.29	13.94	2.00	
95th-Percentile Queue Length [ft/ln]	246.20	256.52	223.24	180.03	357.36	348.48	49.90	

**Movement, Approach, & Intersection Results**

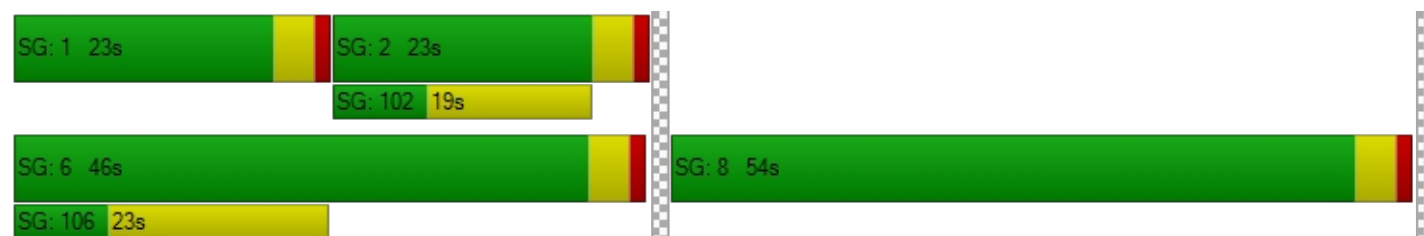
d_M, Delay for Movement [s/veh]	0.00	16.96	17.91	45.52	7.26	0.00	41.91	40.03	29.97	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	17.12			18.82			40.07			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.27											
Intersection LOS	C											
Intersection V/C	0.627											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.208			2.233		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.227			2.693			2.227			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX I-II*

**YEAR 2020 CUMULATIVE SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	30	0	166	108	99	255	0
Total Analysis Volume [veh/h]	0	0	0	93	0	119	0	662	433	397	1021	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	18	0	0	19	0	73	92	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		9	9	62	62	27	93
g / C, Green / Cycle		0.08	0.08	0.56	0.56	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.05	0.07	0.17	0.24	0.22	0.27
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		153	153	2144	1016	435	3201
d1, Uniform Delay [s]		48.55	49.30	12.65	13.75	40.57	1.87
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.86	8.23	0.37	1.31	7.79	0.26
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.61	0.78	0.31	0.43	0.91	0.32
d, Delay for Lane Group [s/veh]		52.41	57.53	13.02	15.06	48.36	2.13
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.62	3.54	4.29	6.32	11.27	1.47
50th-Percentile Queue Length [ft/ln]		65.58	88.62	107.29	157.89	281.81	36.64
95th-Percentile Queue Length [veh/ln]		4.72	6.38	7.69	10.44	16.78	2.64
95th-Percentile Queue Length [ft/ln]		118.04	159.52	192.23	260.93	419.47	65.94

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.41	52.41	57.53	0.00	13.02	15.06	48.36	2.13	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			55.29			13.83			15.08		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	17.70											
Intersection LOS	B											
Intersection V/C	0.592											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.242	1.828	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	255	273	1600
d_b, Bicycle Delay [s]	55.00	41.89	41.02	2.20
I_b,int, Bicycle LOS Score for Intersection	4.132	1.909	2.162	2.729
Bicycle LOS	D	A	B	B

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.620

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	0	100	0	0	0	45	157	0	0	228	36
Total Analysis Volume [veh/h]	437	0	399	0	0	0	181	629	0	0	910	144
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	60	0	0	0	0	0	31	50	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21		13	81	64	64
g / C, Green / Cycle	0.19	0.19	0.19		0.12	0.74	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.16	0.15	0.15		0.10	0.17	0.28	0.29
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	345	345	345		216	2795	1100	1042
d1, Uniform Delay [s]	42.72	42.51	42.27		47.34	4.61	13.48	13.77
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.17	4.51	3.92		8.34	0.19	1.49	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.81	0.78		0.84	0.23	0.48	0.51
d, Delay for Lane Group [s/veh]	47.89	47.02	46.19		55.67	4.80	14.98	15.53
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.93	7.63	7.32		5.33	2.03	7.73	7.94
50th-Percentile Queue Length [ft/ln]	198.23	190.76	182.91		133.26	50.79	193.27	198.50
95th-Percentile Queue Length [veh/ln]	12.55	12.16	11.75		9.12	3.66	12.29	12.56
95th-Percentile Queue Length [ft/ln]	313.68	304.02	293.81		227.92	91.43	307.27	314.03

**Movement, Approach, & Intersection Results**

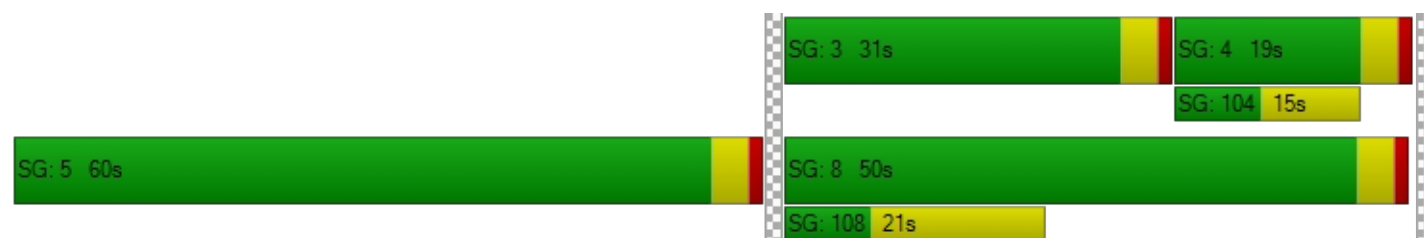
d_M, Delay for Movement [s/veh]	47.58	0.00	46.45	0.00	0.00	0.00	55.67	4.80	0.00	0.00	15.21	15.53
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	47.05			0.00			16.17			15.25		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	25.37											
Intersection LOS	C											
Intersection V/C	0.620											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.221	1.750	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	836	273
d_b, Bicycle Delay [s]	55.00	55.00	18.62	41.02
I_b,int, Bicycle LOS Score for Intersection	5.512	4.132	2.228	2.429
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.707

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	410	0	0	350	170	0	0	0	55	89	92
Total Analysis Volume [veh/h]	114	1639	0	0	1401	681	0	0	0	218	354	367
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	68	58	58		24	24	24
g / C, Green / Cycle	0.06	0.68	0.58	0.58		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.37	0.39		0.12	0.09	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3880	2213	1048		431	909	431
d1, Uniform Delay [s]	45.82	7.15	13.74	14.20		32.92	31.91	36.35
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.34	1.36	3.29		0.92	0.27	4.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.42	0.63	0.66		0.51	0.39	0.85
d, Delay for Lane Group [s/veh]	48.19	7.49	15.10	17.49		33.85	32.18	41.20
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	4.71	9.94	10.79		4.64	3.60	8.99
50th-Percentile Queue Length [ft/ln]	35.98	117.77	248.39	269.79		115.91	89.90	224.81
95th-Percentile Queue Length [veh/ln]	2.59	8.27	15.10	16.18		8.17	6.47	13.91
95th-Percentile Queue Length [ft/ln]	64.76	206.76	377.62	404.47		204.20	161.83	347.76

**Movement, Approach, & Intersection Results**

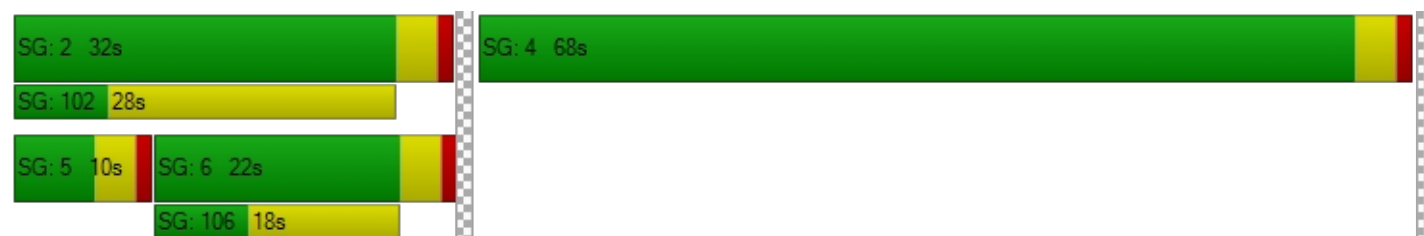
d_M, Delay for Movement [s/veh]	48.19	7.49	0.00	0.00	15.12	17.49	0.00	0.00	0.00	33.85	32.18	41.20
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	10.14			15.90			0.00			36.09		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.76											
Intersection LOS	B											
Intersection V/C	0.707											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.280	2.365
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	560	360	0	1280
d_b, Bicycle Delay [s]	25.92	33.62	50.00	6.48
I_b,int, Bicycle LOS Score for Intersection	2.524	2.705	4.132	2.334
Bicycle LOS	B	B	D	B

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	215	0	0	284	82	0	0	0	33	137	190
Total Analysis Volume [veh/h]	103	858	0	0	1137	327	0	0	0	133	549	761
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	44	0	0	33	0	0	0	0	0	56	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	47	36	36		45	45	45
g / C, Green / Cycle	0.07	0.47	0.36	0.36		0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.26	0.27		0.19	0.18	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	2654	1348	638		818	863	818
d1, Uniform Delay [s]	45.79	16.81	28.02	28.57		18.42	18.09	25.78
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.33
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.32	3.41	8.47		0.35	0.29	13.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.32	0.72	0.76		0.42	0.39	0.93
d, Delay for Lane Group [s/veh]	57.11	17.14	31.43	37.04		18.76	18.37	39.32
Lane Group LOS	E	B	C	D		B	B	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	4.11	10.51	11.56		5.32	5.09	19.25
50th-Percentile Queue Length [ft/ln]	72.68	102.68	262.70	289.11		133.07	127.23	481.31
95th-Percentile Queue Length [veh/ln]	5.23	7.39	15.82	17.14		9.11	8.79	26.45
95th-Percentile Queue Length [ft/ln]	130.82	184.82	395.61	428.54		227.66	219.72	661.20

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.11	17.14	0.00	0.00	32.22	37.04	0.00	0.00	0.00	18.76	18.52	39.32
Movement LOS	E	B			C	D				B	B	D
d_A, Approach Delay [s/veh]	21.42			33.30			0.00			29.51		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	28.93											
Intersection LOS	C											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.197			2.414		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			580			0			1040		
d_b, Bicycle Delay [s]	18.00			25.21			50.00			11.52		
I_b,int, Bicycle LOS Score for Intersection	2.088			2.365			4.132			2.750		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.636

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	256	69	125	288	0	208	52	46	0	0	0
Total Analysis Volume [veh/h]	0	1024	276	499	1153	0	830	206	182	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	28	57	0	0	43	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	43	43	17	64	28	28	28	
g / C, Green / Cycle	0.43	0.43	0.17	0.64	0.28	0.28	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.24	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2471	780	590	3660	973	528	500	
d1, Uniform Delay [s]	19.56	18.96	40.31	8.03	34.17	29.24	29.00	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	1.26	3.44	0.23	2.25	0.47	0.44	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.35	0.85	0.32	0.85	0.39	0.36	
d, Delay for Lane Group [s/veh]	20.08	20.21	43.75	8.26	36.42	29.71	29.45	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.46	4.46	6.16	3.48	9.65	4.04	3.54	
50th-Percentile Queue Length [ft/ln]	136.61	111.54	154.10	86.93	241.16	100.93	88.47	
95th-Percentile Queue Length [veh/ln]	9.30	7.93	10.24	6.26	14.74	7.27	6.37	
95th-Percentile Queue Length [ft/ln]	232.45	198.14	255.90	156.48	368.50	181.67	159.25	

**Movement, Approach, & Intersection Results**

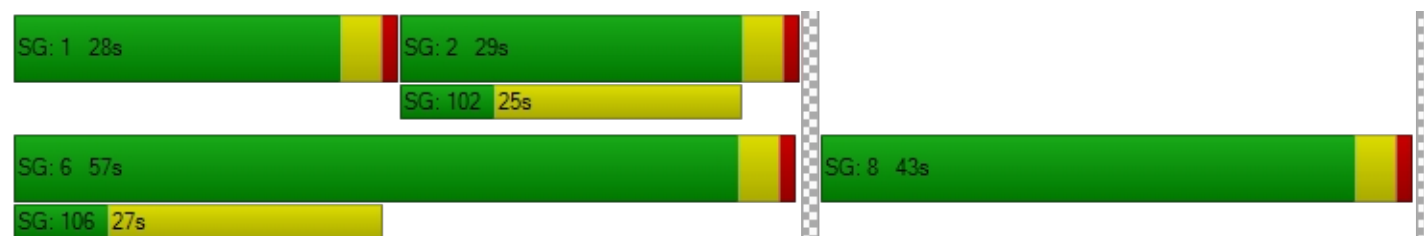
d_M, Delay for Movement [s/veh]	0.00	20.08	20.21	43.75	8.26	0.00	36.42	29.71	29.45	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	20.11			18.98			34.24			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	23.79											
Intersection LOS	C											
Intersection V/C	0.636											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.433			2.198		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1060			780			0		
d_b, Bicycle Delay [s]	28.13			11.05			18.61			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.468			3.569			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	28.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	159	43	149	189	0	48	190	16	0	0	0
Total Analysis Volume [veh/h]	0	637	172	597	757	0	190	760	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	26	49	0	0	51	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	19	62	30	30	30	
g / C, Green / Cycle	0.39	0.39	0.19	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.17	0.20	0.27	0.25	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1471	697	676	2357	539	569	539	
d1, Uniform Delay [s]	21.88	22.09	39.25	9.00	33.44	32.59	25.42	
k, delay calibration	0.50	0.50	0.11	0.50	0.14	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.71	1.62	4.04	0.36	6.76	3.22	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.37	0.39	0.88	0.32	0.89	0.83	0.12	
d, Delay for Lane Group [s/veh]	22.59	23.71	43.28	9.36	40.21	35.81	25.51	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.59	4.80	7.41	3.74	11.86	10.86	1.10	
50th-Percentile Queue Length [ft/ln]	114.67	119.93	185.20	93.48	296.43	271.51	27.40	
95th-Percentile Queue Length [veh/ln]	8.10	8.39	11.87	6.73	17.50	16.27	1.97	
95th-Percentile Queue Length [ft/ln]	202.48	209.73	296.79	168.27	437.61	406.63	49.33	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	22.76	23.71	43.28	9.36	0.00	40.21	37.49	25.51	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	22.96			24.32			37.25			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.10											
Intersection LOS	C											
Intersection V/C	0.667											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.274			2.465		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			900			940			0		
d_b, Bicycle Delay [s]	32.81			15.13			14.05			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.005			2.677			2.395			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX I-III*

**YEAR 2020 CUMULATIVE SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	26	0	31	0	169	112	96	221	0
Total Analysis Volume [veh/h]	0	0	0	103	0	122	0	674	446	385	882	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	26	0	0	19	0	65	84	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	62	62	26	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.24	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.07	0.18	0.25	0.21	0.23
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		159	159	2157	1022	423	3188
d1, Uniform Delay [s]		48.47	49.02	12.50	13.67	40.94	1.86
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.36	7.49	0.38	1.36	7.82	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.65	0.77	0.31	0.44	0.91	0.28
d, Delay for Lane Group [s/veh]		52.83	56.51	12.88	15.03	48.77	2.08
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.92	3.60	4.34	6.51	10.95	1.27
50th-Percentile Queue Length [ft/ln]		73.02	89.97	108.62	162.73	273.83	31.64
95th-Percentile Queue Length [veh/ln]		5.26	6.48	7.76	10.69	16.38	2.28
95th-Percentile Queue Length [ft/ln]		131.44	161.95	194.08	267.33	409.53	56.95



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.83	52.83	56.51	0.00	12.88	15.03	48.77	2.08	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			54.83			13.74			16.26		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.50											
Intersection LOS	B											
Intersection V/C	0.594											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.243	1.834	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	400	273	1455
d_b, Bicycle Delay [s]	55.00	35.20	41.02	4.09
I_b,int, Bicycle LOS Score for Intersection	4.132	1.931	2.176	2.605
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	117	0	108	0	0	0	51	154	0	0	206	38
Total Analysis Volume [veh/h]	468	0	430	0	0	0	205	617	0	0	823	150
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	67	0	0	0	0	0	15	43	0	0	28	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22		15	80	61	61
g / C, Green / Cycle	0.20	0.20	0.20		0.13	0.72	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.16		0.11	0.16	0.26	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	365	365	365		241	2753	1053	998
d1, Uniform Delay [s]	42.06	41.92	41.77		46.57	4.98	14.68	14.96
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.01	4.61	4.21		8.26	0.19	1.46	1.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.82	0.81		0.85	0.22	0.46	0.49
d, Delay for Lane Group [s/veh]	47.07	46.54	45.97		54.83	5.17	16.13	16.67
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.37	8.18	7.97		6.01	2.11	7.44	7.63
50th-Percentile Queue Length [ft/ln]	209.36	204.60	199.26		150.21	52.78	186.10	190.66
95th-Percentile Queue Length [veh/ln]	13.12	12.88	12.60		10.03	3.80	11.92	12.16
95th-Percentile Queue Length [ft/ln]	328.00	321.89	315.01		250.71	95.00	297.96	303.88

**Movement, Approach, & Intersection Results**

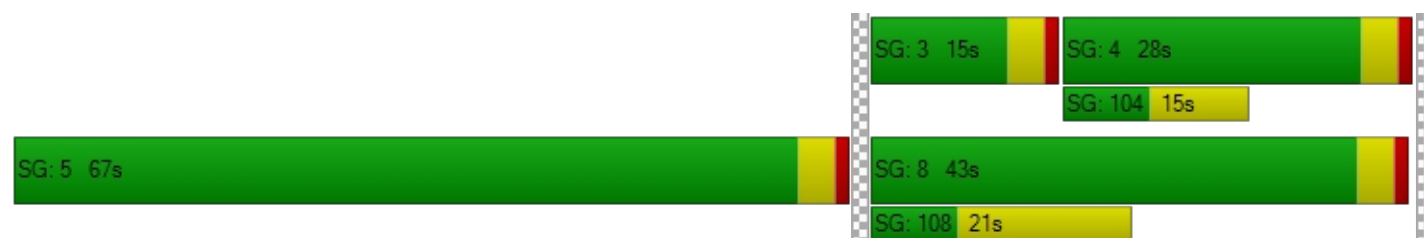
d_M, Delay for Movement [s/veh]	46.88	0.00	46.15	0.00	0.00	0.00	54.83	5.17	0.00	0.00	16.35	16.67
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	46.53			0.00			17.56			16.40		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.80											
Intersection LOS	C											
Intersection V/C	0.621											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.242	1.779	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	709	436
d_b, Bicycle Delay [s]	55.00	55.00	22.91	33.62
I_b,int, Bicycle LOS Score for Intersection	5.614	4.132	2.238	2.362
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	20.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.775

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	408	0	0	362	161	0	0	0	55	91	118
Total Analysis Volume [veh/h]	112	1632	0	0	1448	642	0	0	0	219	365	473
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	62	52	52		30	30	30
g / C, Green / Cycle	0.06	0.62	0.52	0.52		0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.37	0.39		0.12	0.10	0.26
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3541	1987	941		538	1136	538
d1, Uniform Delay [s]	45.81	10.06	17.97	18.57		27.99	27.19	33.35
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.43	2.09	5.22		0.50	0.16	4.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.46	0.70	0.74		0.41	0.32	0.88
d, Delay for Lane Group [s/veh]	48.11	10.49	20.07	23.79		28.48	27.36	38.18
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	5.97	11.97	13.13		4.21	3.38	11.37
50th-Percentile Queue Length [ft/ln]	35.31	149.14	299.25	328.36		105.28	84.39	284.22
95th-Percentile Queue Length [veh/ln]	2.54	9.97	17.64	19.08		7.58	6.08	16.90
95th-Percentile Queue Length [ft/ln]	63.56	249.28	441.10	476.95		189.42	151.90	422.46



**Movement, Approach, & Intersection Results**

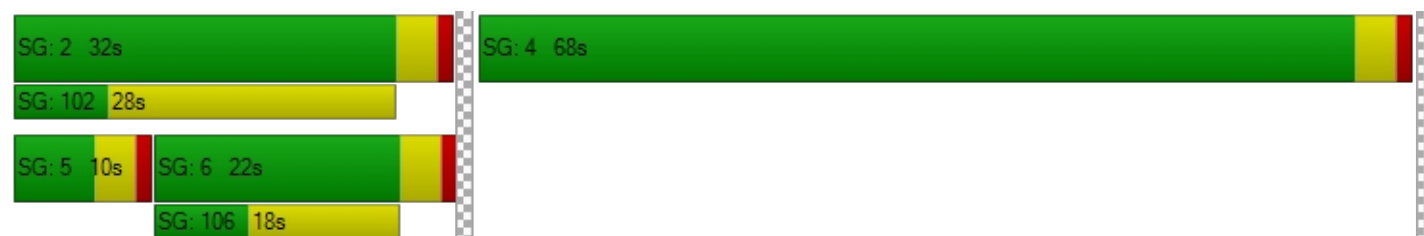
d_M, Delay for Movement [s/veh]	48.11	10.49	0.00	0.00	20.21	23.79	0.00	0.00	0.00	28.48	27.36	38.18
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	12.91			21.31			0.00			32.43		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	20.72											
Intersection LOS	C											
Intersection V/C	0.775											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.265			2.394		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.519			2.709			4.132			2.432		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	175	0	0	265	72	0	0	0	43	135	171
Total Analysis Volume [veh/h]	84	700	0	0	1058	288	0	0	0	171	540	684
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.24	0.25		0.20	0.19	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2856	1522	721		754	796	754
d1, Uniform Delay [s]	46.31	14.20	23.52	23.93		21.09	20.71	27.22
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.03	0.20	1.68	4.02		0.47	0.39	6.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.59	0.62		0.48	0.44	0.91
d, Delay for Lane Group [s/veh]	57.34	14.40	25.20	27.94		21.55	21.10	34.17
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.38	2.97	8.44	9.03		6.05	5.81	16.08
50th-Percentile Queue Length [ft/ln]	59.49	74.36	210.89	225.63		151.17	145.16	401.95
95th-Percentile Queue Length [veh/ln]	4.28	5.35	13.20	13.95		10.08	9.76	22.65
95th-Percentile Queue Length [ft/ln]	107.08	133.85	329.97	348.80		251.99	243.96	566.35

**Movement, Approach, & Intersection Results**

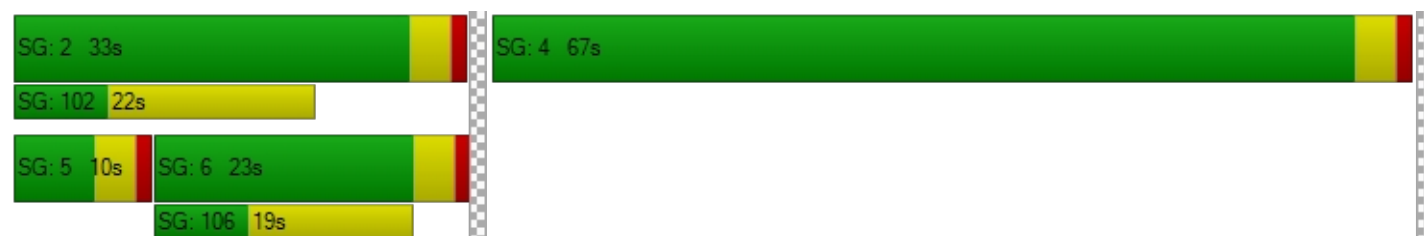
d_M, Delay for Movement [s/veh]	57.34	14.40	0.00	0.00	25.62	27.94	0.00	0.00	0.00	21.55	21.26	34.17
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	19.00			26.11			0.00			27.63		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	25.13											
Intersection LOS	C											
Intersection V/C	0.768											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.164	2.398
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	1.991	2.300	4.132	2.710
Bicycle LOS	A	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	258	66	123	288	0	173	58	37	0	0	0
Total Analysis Volume [veh/h]	0	1033	262	491	1152	0	690	231	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	17	68	24	24	24	
g / C, Green / Cycle	0.48	0.48	0.17	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.20	0.20	0.12	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2715	857	588	3900	825	448	424	
d1, Uniform Delay [s]	16.75	16.05	40.26	6.25	36.37	33.24	31.80	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.41	0.92	3.21	0.19	2.33	0.92	0.48	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.38	0.31	0.84	0.30	0.84	0.52	0.35	
d, Delay for Lane Group [s/veh]	17.16	16.98	43.48	6.44	38.70	34.16	32.28	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.01	3.80	6.04	2.90	8.15	4.94	2.99	
50th-Percentile Queue Length [ft/ln]	125.17	94.88	150.99	72.58	203.76	123.47	74.84	
95th-Percentile Queue Length [veh/ln]	8.68	6.83	10.07	5.23	12.83	8.58	5.39	
95th-Percentile Queue Length [ft/ln]	216.91	170.79	251.75	130.64	320.81	214.59	134.72	



**Movement, Approach, & Intersection Results**

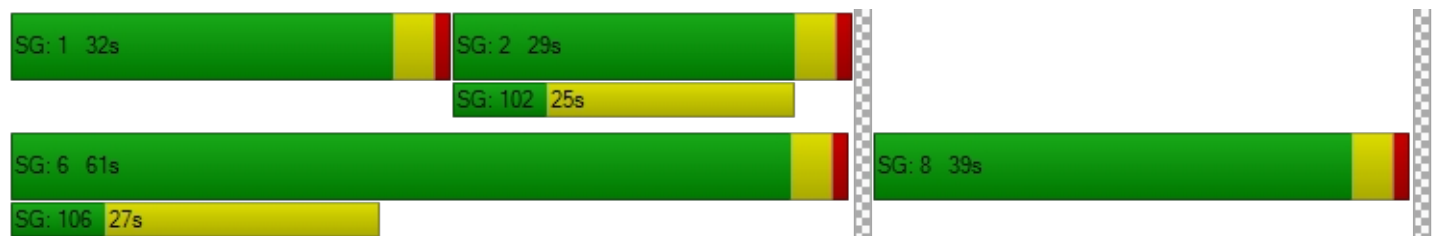
d_M, Delay for Movement [s/veh]	0.00	17.16	16.98	43.48	6.44	0.00	38.70	34.16	32.28	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	17.12			17.51			36.84			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.54											
Intersection LOS	C											
Intersection V/C	0.589											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.396			2.199		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.272			2.463			3.322			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	145	45	142	179	0	50	187	15	0	0	0
Total Analysis Volume [veh/h]	0	578	179	568	717	0	201	749	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	40	40	18	62	30	30	30	
g / C, Green / Cycle	0.40	0.40	0.18	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.16	0.19	0.27	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1510	715	641	2357	539	569	539	
d1, Uniform Delay [s]	20.94	21.12	39.84	8.88	33.44	32.60	25.34	
k, delay calibration	0.50	0.50	0.11	0.50	0.13	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.60	1.37	4.37	0.33	6.01	3.12	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.33	0.35	0.89	0.30	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	21.54	22.49	44.21	9.22	39.45	35.72	25.43	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.16	4.34	7.11	3.49	11.74	10.85	1.01	
50th-Percentile Queue Length [ft/ln]	103.92	108.43	177.63	87.36	293.42	271.33	25.15	
95th-Percentile Queue Length [veh/ln]	7.48	7.75	11.48	6.29	17.36	16.26	1.81	
95th-Percentile Queue Length [ft/ln]	187.05	193.82	286.92	157.25	433.88	406.40	45.28	

**Movement, Approach, & Intersection Results**

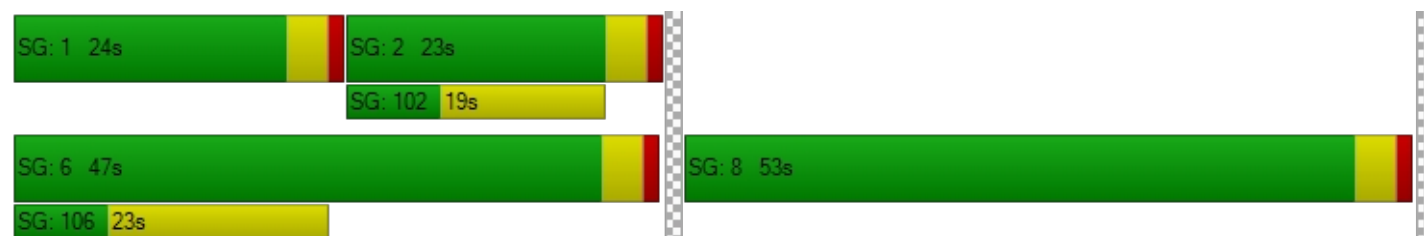
d_M, Delay for Movement [s/veh]	0.00	21.66	22.49	44.21	9.22	0.00	39.45	37.11	25.43	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	21.86			24.68			36.90			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.02											
Intersection LOS	C											
Intersection V/C	0.647											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.273			2.449		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.976			2.620			2.391			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX I-IV*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	31	44	54	0	260	132	52	401	0
Total Analysis Volume [veh/h]	0	0	0	122	177	217	0	1038	527	209	1602	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	70	0	0	30	0	10	40	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	62	62	15	81
g / C, Green / Cycle		0.19	0.19	0.56	0.56	0.14	0.74
(v / s)_i Volume / Saturation Flow Rate		0.17	0.12	0.27	0.29	0.12	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		344	344	2143	1015	244	2797
d1, Uniform Delay [s]		43.15	40.91	14.38	14.78	46.46	6.62
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		6.75	1.91	0.79	1.90	8.31	0.86
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.87	0.63	0.48	0.52	0.85	0.57
d, Delay for Lane Group [s/veh]		49.89	42.82	15.17	16.68	54.77	7.48
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.47	5.57	7.69	8.31	6.13	7.50
50th-Percentile Queue Length [ft/ln]		211.77	139.20	192.20	207.85	153.13	187.62
95th-Percentile Queue Length [veh/ln]		13.24	9.44	12.24	13.04	10.18	12.00
95th-Percentile Queue Length [ft/ln]		331.10	235.95	305.89	326.07	254.60	299.93

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	49.89	49.89	42.82	0.00	15.17	16.68	54.77	7.48	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			46.92			15.68			12.93		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	18.54											
Intersection LOS	B											
Intersection V/C	0.660											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.323	1.976	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1200	473	655
d_b, Bicycle Delay [s]	55.00	8.80	32.07	24.89
I_b,int, Bicycle LOS Score for Intersection	4.132	2.411	2.420	3.054
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	0	124	0	0	0	37	249	0	0	315	52
Total Analysis Volume [veh/h]	635	0	496	0	0	0	149	995	0	0	1259	208
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	79	0	0	0	0	0	10	31	0	0	21	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		11	75	60	60
g / C, Green / Cycle	0.25	0.25	0.25		0.10	0.68	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.08	0.26	0.39	0.41
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	445	445	445		183	2584	1030	976
d1, Uniform Delay [s]	39.42	39.42	39.42		48.39	7.62	18.77	19.45
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.55	4.55	4.55		8.53	0.44	4.19	5.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.82	0.39	0.71	0.75
d, Delay for Lane Group [s/veh]	43.97	43.97	43.97		56.92	8.06	22.96	24.78
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.15	10.15	10.15		4.42	4.80	14.46	15.19
50th-Percentile Queue Length [ft/ln]	253.83	253.83	253.83		110.60	120.05	361.55	379.72
95th-Percentile Queue Length [veh/ln]	15.38	15.38	15.38		7.87	8.40	20.70	21.58
95th-Percentile Queue Length [ft/ln]	384.47	384.47	384.47		196.84	209.90	517.47	539.50

**Movement, Approach, & Intersection Results**

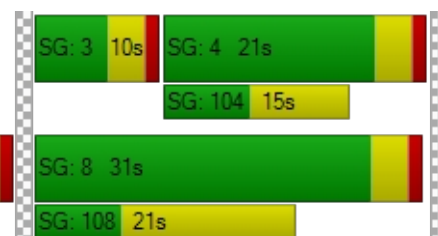
d_M, Delay for Movement [s/veh]	43.97	0.00	43.97	0.00	0.00	0.00	56.92	8.06	0.00	0.00	23.72	24.78
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	43.97			0.00			14.42			23.87		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	27.06											
Intersection LOS	C											
Intersection V/C	0.785											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.317	1.781	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	491	309
d_b, Bicycle Delay [s]	55.00	55.00	31.31	39.31
I_b,int, Bicycle LOS Score for Intersection	5.999	4.132	2.503	2.770
Bicycle LOS	F	D	B	C

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	495	0	0	358	132	0	0	0	78	97	95
Total Analysis Volume [veh/h]	78	1980	0	0	1431	526	0	0	0	312	388	379
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	67	58	58		25	25	25
g / C, Green / Cycle	0.05	0.67	0.58	0.58		0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.35	0.34	0.36		0.17	0.10	0.21
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	189	3825	2192	1038		448	946	448
d1, Uniform Delay [s]	45.76	8.29	13.63	14.04		34.11	31.41	35.72
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.43	0.50	1.20	2.88		1.96	0.29	4.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.52	0.60	0.63		0.70	0.41	0.85
d, Delay for Lane Group [s/veh]	47.19	8.80	14.83	16.92		36.07	31.69	40.18
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.97	6.50	9.16	9.89		7.03	3.92	9.19
50th-Percentile Queue Length [ft/ln]	24.28	162.62	229.07	247.29		175.72	98.04	229.65
95th-Percentile Queue Length [veh/ln]	1.75	10.69	14.13	15.05		11.38	7.06	14.16
95th-Percentile Queue Length [ft/ln]	43.71	267.19	353.18	376.24		284.41	176.47	353.91

**Movement, Approach, & Intersection Results**

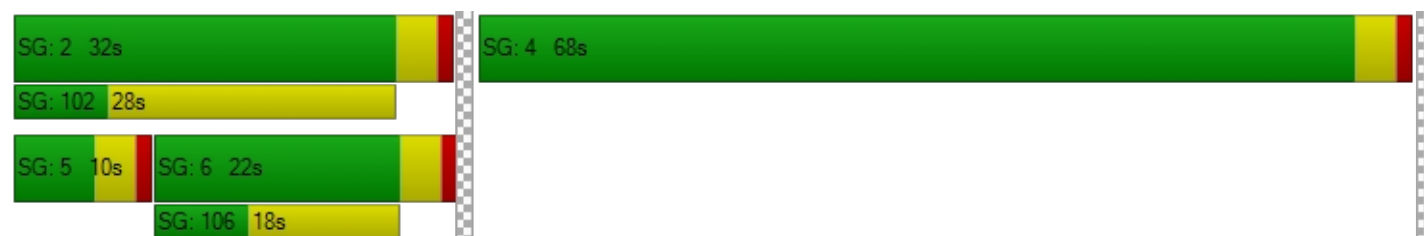
d_M, Delay for Movement [s/veh]	47.19	8.80	0.00	0.00	15.02	16.92	0.00	0.00	0.00	36.07	31.69	40.18
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	10.25			15.53			0.00			35.94		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.72											
Intersection LOS	B											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.203			2.399		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.692			2.636			4.132			2.450		
Bicycle LOS	B			B			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.794

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	309	0	0	310	86	0	0	0	43	147	157
Total Analysis Volume [veh/h]	103	1236	0	0	1238	343	0	0	0	170	588	628
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	46	0	0	35	0	0	0	0	0	54	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	53	42	42		39	39	39
g / C, Green / Cycle	0.07	0.53	0.42	0.42		0.39	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.28	0.29		0.21	0.20	0.35
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	3042	1607	761		695	734	695
d1, Uniform Delay [s]	45.79	13.89	23.05	23.55		23.92	23.46	28.92
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.24
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.40	2.11	5.13		0.68	0.55	9.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.41	0.66	0.69		0.55	0.51	0.90
d, Delay for Lane Group [s/veh]	57.11	14.29	25.16	28.69		24.61	24.01	38.49
Lane Group LOS	E	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.41	10.05	10.87		7.03	6.72	15.51
50th-Percentile Queue Length [ft/ln]	72.68	135.28	251.28	271.87		175.69	168.12	387.74
95th-Percentile Queue Length [veh/ln]	5.23	9.23	15.25	16.28		11.38	10.98	21.97
95th-Percentile Queue Length [ft/ln]	130.82	230.66	381.26	407.08		284.38	274.44	549.20

**Movement, Approach, & Intersection Results**

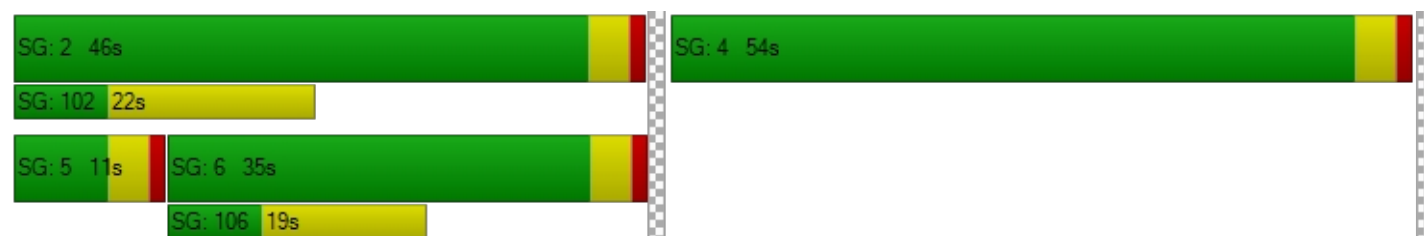
d_M, Delay for Movement [s/veh]	57.11	14.29	0.00	0.00	25.68	28.69	0.00	0.00	0.00	24.61	24.23	38.49
Movement LOS	E	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	17.58			26.34			0.00			30.74		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	25.03											
Intersection LOS	C											
Intersection V/C	0.794											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.224			2.395		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			620			0			1000		
d_b, Bicycle Delay [s]	16.82			23.81			50.00			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.296			2.429			4.132			2.703		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	349	54	71	377	0	181	75	37	0	0	0
Total Analysis Volume [veh/h]	0	1397	217	282	1509	0	725	299	148	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	32	0	14	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	10	67	25	25	25	
g / C, Green / Cycle	0.53	0.53	0.10	0.67	0.25	0.25	0.25	
(v / s)_i Volume / Saturation Flow Rate	0.25	0.12	0.08	0.26	0.21	0.16	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3020	954	348	3815	878	476	451	
d1, Uniform Delay [s]	14.65	12.57	44.10	7.44	35.40	33.31	30.59	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.51	0.56	4.52	0.31	2.05	1.36	0.42	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.23	0.81	0.40	0.83	0.63	0.33	
d, Delay for Lane Group [s/veh]	15.16	13.13	48.62	7.75	37.46	34.68	31.01	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.42	2.66	3.61	4.42	8.45	6.54	2.94	
50th-Percentile Queue Length [ft/ln]	160.43	66.42	90.34	110.53	211.19	163.57	73.60	
95th-Percentile Queue Length [veh/ln]	10.57	4.78	6.50	7.87	13.21	10.74	5.30	
95th-Percentile Queue Length [ft/ln]	264.29	119.55	162.61	196.73	330.35	268.44	132.48	

**Movement, Approach, & Intersection Results**

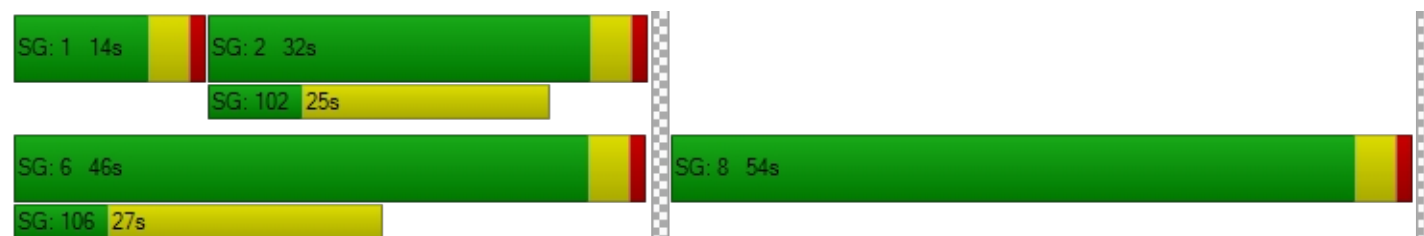
d_M, Delay for Movement [s/veh]	0.00	15.16	13.13	48.62	7.75	0.00	37.46	34.68	31.01	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	14.89			14.18			35.93			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	20.00											
Intersection LOS	C											
Intersection V/C	0.605											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.422			2.109		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			840			1000			0		
d_b, Bicycle Delay [s]	25.92			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.447			2.545			3.493			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	251	53	104	240	0	82	107	15	0	0	0
Total Analysis Volume [veh/h]	0	1005	212	415	959	0	329	426	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	24	47	0	0	53	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	14	68	24	24	24	
g / C, Green / Cycle	0.50	0.50	0.14	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.21	0.23	0.12	0.25	0.21	0.20	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1885	893	499	2579	434	458	434	
d1, Uniform Delay [s]	16.14	16.39	41.70	6.90	36.42	35.93	29.75	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.72	1.67	3.66	0.41	5.43	3.80	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.43	0.45	0.83	0.37	0.87	0.82	0.13	
d, Delay for Lane Group [s/veh]	16.86	18.06	45.35	7.31	41.86	39.73	29.89	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.92	6.23	5.18	4.02	9.34	9.06	1.11	
50th-Percentile Queue Length [ft/ln]	147.95	155.77	129.55	100.51	233.48	226.54	27.68	
95th-Percentile Queue Length [veh/ln]	9.91	10.32	8.92	7.24	14.35	14.00	1.99	
95th-Percentile Queue Length [ft/ln]	247.70	258.12	222.88	180.92	358.78	349.96	49.82	

**Movement, Approach, & Intersection Results**

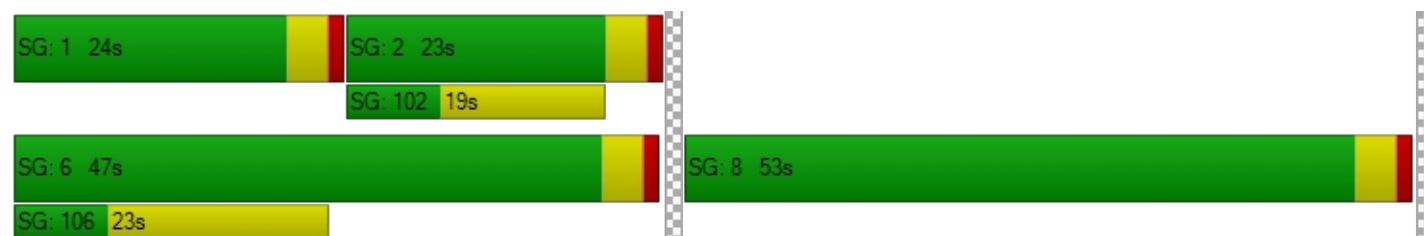
d_M, Delay for Movement [s/veh]	0.00	17.09	18.06	45.35	7.31	0.00	41.86	39.97	29.89	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	17.26			18.80			40.01			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	23.32											
Intersection LOS	C											
Intersection V/C	0.629											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.209			2.233		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			860			980			0		
d_b, Bicycle Delay [s]	32.81			16.25			13.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.229			2.693			2.230			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX I-V*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	20.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	61	0	180	121	99	323	0
Total Analysis Volume [veh/h]	0	0	0	93	0	242	0	718	483	397	1291	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	19	0	68	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		17	17	55	55	27	85
g / C, Green / Cycle		0.15	0.15	0.50	0.50	0.24	0.78
(v / s)_i Volume / Saturation Flow Rate		0.05	0.13	0.19	0.27	0.22	0.34
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		274	274	1889	895	435	2945
d1, Uniform Delay [s]		41.68	45.66	17.14	19.00	40.58	4.21
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.73	9.17	0.58	2.33	7.83	0.48
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.34	0.88	0.38	0.54	0.91	0.44
d, Delay for Lane Group [s/veh]		42.41	54.84	17.72	21.33	48.41	4.69
Lane Group LOS		D	D	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.31	7.13	5.68	8.82	11.28	4.09
50th-Percentile Queue Length [ft/ln]		57.82	178.35	141.93	220.46	281.91	102.28
95th-Percentile Queue Length [veh/ln]		4.16	11.51	9.58	13.69	16.78	7.36
95th-Percentile Queue Length [ft/ln]		104.08	287.86	239.62	342.21	419.59	184.11

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	42.41	42.41	54.84	0.00	17.72	21.33	48.41	4.69	0.00
Movement LOS				D	D	D		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			51.39			19.18			14.97		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	20.32											
Intersection LOS	C											
Intersection V/C	0.700											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.291	1.888	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	273	1509
d_b, Bicycle Delay [s]	55.00	37.64	41.02	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.112	2.220	2.952
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	155	0	100	0	0	0	54	163	0	0	249	36
Total Analysis Volume [veh/h]	621	0	399	0	0	0	214	652	0	0	996	144
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	59	0	0	0	0	0	32	51	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25		15	77	58	58
g / C, Green / Cycle	0.22	0.22	0.22		0.14	0.70	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.12	0.17	0.30	0.32
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	404	404	404		250	2671	1003	950
d1, Uniform Delay [s]	40.78	40.78	40.78		46.28	5.86	17.52	17.95
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.80	4.80	4.80		8.24	0.22	2.34	2.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.84	0.84		0.86	0.24	0.57	0.60
d, Delay for Lane Group [s/veh]	45.59	45.59	45.59		54.53	6.08	19.86	20.75
Lane Group LOS	D	D	D		D	A	B	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.26	9.26	9.26		6.26	2.52	10.05	10.37
50th-Percentile Queue Length [ft/ln]	231.54	231.54	231.54		156.55	62.97	251.31	259.24
95th-Percentile Queue Length [veh/ln]	14.25	14.25	14.25		10.37	4.53	15.25	15.65
95th-Percentile Queue Length [ft/ln]	356.32	356.32	356.32		259.15	113.34	381.31	391.27

**Movement, Approach, & Intersection Results**

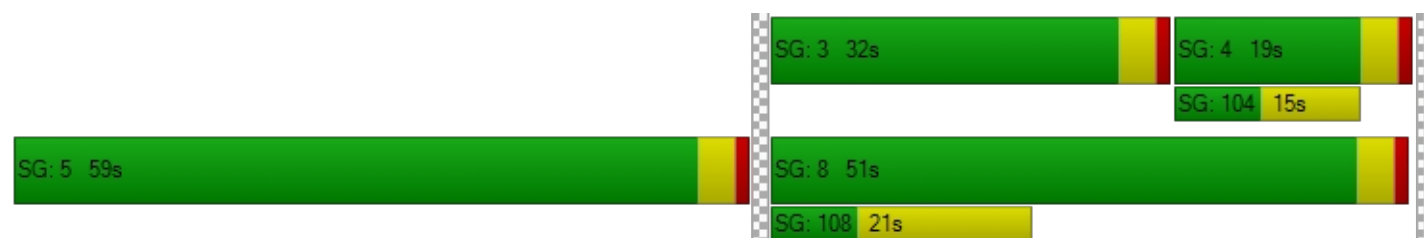
d_M, Delay for Movement [s/veh]	45.59	0.00	45.59	0.00	0.00	0.00	54.53	6.08	0.00	0.00	20.24	20.75
Movement LOS	D		D				D	A			C	C
d_A, Approach Delay [s/veh]	45.59			0.00			18.05			20.30		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	28.18											
Intersection LOS	C											
Intersection V/C	0.701											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.281	1.782	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	855	273
d_b, Bicycle Delay [s]	55.00	55.00	18.04	41.02
I_b,int, Bicycle LOS Score for Intersection	5.815	4.132	2.274	2.500
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	441	0	0	354	175	0	0	0	55	96	92
Total Analysis Volume [veh/h]	114	1762	0	0	1414	701	0	0	0	218	384	367
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	68	58	58		24	24	24
g / C, Green / Cycle	0.06	0.68	0.58	0.58		0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.37	0.39		0.12	0.10	0.20
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3876	2210	1047		432	912	432
d1, Uniform Delay [s]	45.82	7.41	13.92	14.39		32.87	32.13	36.28
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.39	1.42	3.46		0.91	0.31	4.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.45	0.64	0.67		0.50	0.42	0.85
d, Delay for Lane Group [s/veh]	48.19	7.80	15.34	17.85		33.78	32.44	41.04
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	5.24	10.22	11.12		4.63	3.93	8.97
50th-Percentile Queue Length [ft/ln]	35.98	131.06	255.39	277.94		115.78	98.32	224.35
95th-Percentile Queue Length [veh/ln]	2.59	9.00	15.46	16.59		8.16	7.08	13.89
95th-Percentile Queue Length [ft/ln]	64.76	224.93	386.44	414.65		204.01	176.97	347.18

**Movement, Approach, & Intersection Results**

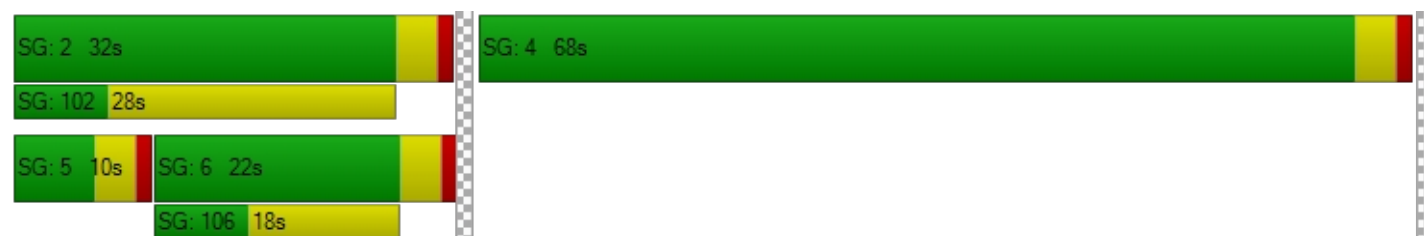
d_M, Delay for Movement [s/veh]	48.19	7.80	0.00	0.00	15.35	17.85	0.00	0.00	0.00	33.78	32.44	41.04
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	10.25			16.18			0.00			36.00		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	17.81											
Intersection LOS	B											
Intersection V/C	0.714											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.304			2.372		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.591			2.723			4.132			2.359		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.896

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	255	0	0	291	89	0	0	0	33	137	203
Total Analysis Volume [veh/h]	103	1018	0	0	1163	357	0	0	0	133	549	810
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	34	0	0	23	0	0	0	0	0	66	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	7	43	32	32		49	49	49
g / C, Green / Cycle	0.07	0.43	0.32	0.32		0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.06	0.18	0.27	0.28		0.19	0.18	0.45
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	128	2472	1227	581		875	924	875
d1, Uniform Delay [s]	45.79	19.52	31.27	31.91		16.33	16.03	23.99
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.27
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.32	0.51	6.44	16.41		0.29	0.24	10.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.41	0.83	0.87		0.39	0.36	0.93
d, Delay for Lane Group [s/veh]	57.11	20.03	37.70	48.32		16.62	16.27	34.39
Lane Group LOS	E	C	D	D		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.91	5.42	12.09	13.87		4.94	4.72	19.30
50th-Percentile Queue Length [ft/ln]	72.68	135.60	302.31	346.78		123.47	117.93	482.43
95th-Percentile Queue Length [veh/ln]	5.23	9.24	17.80	19.98		8.58	8.28	26.50
95th-Percentile Queue Length [ft/ln]	130.82	231.08	444.88	499.48		214.59	206.97	662.53

**Movement, Approach, & Intersection Results**

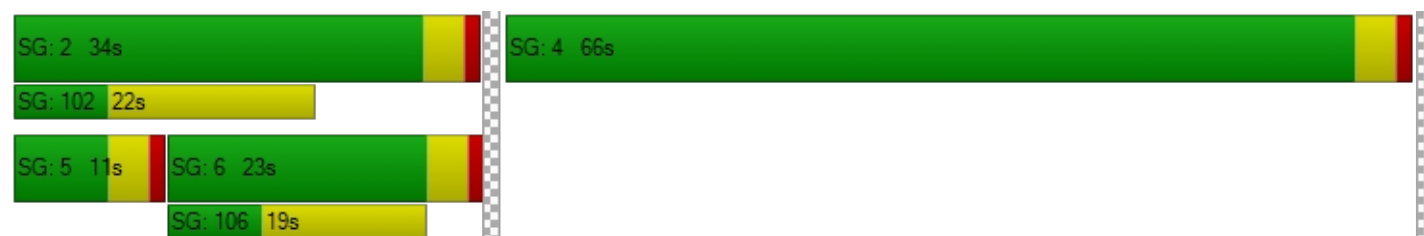
d_M, Delay for Movement [s/veh]	57.11	20.03	0.00	0.00	39.07	48.32	0.00	0.00	0.00	16.62	16.41	34.39
Movement LOS	E	C			D	D				B	B	C
d_A, Approach Delay [s/veh]	23.44			41.24			0.00			26.19		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	30.98											
Intersection LOS	C											
Intersection V/C	0.896											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.212			2.430		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			380			0			1240		
d_b, Bicycle Delay [s]	24.50			32.81			50.00			7.22		
I_b,int, Bicycle LOS Score for Intersection	2.176			2.396			4.132			2.791		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.669

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	268	69	125	292	0	226	79	46	0	0	0
Total Analysis Volume [veh/h]	0	1073	276	499	1166	0	904	317	182	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	41	41	17	62	30	30	30	
g / C, Green / Cycle	0.41	0.41	0.17	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.15	0.14	0.20	0.26	0.17	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2340	739	588	3526	1055	573	543	
d1, Uniform Delay [s]	21.40	20.52	40.37	9.15	32.90	29.29	27.15	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.65	1.44	3.53	0.25	2.14	0.84	0.36	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.46	0.37	0.85	0.33	0.86	0.55	0.34	
d, Delay for Lane Group [s/veh]	22.05	21.96	43.90	9.40	35.04	30.13	27.51	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.08	4.69	6.18	3.85	10.38	6.42	3.40	
50th-Percentile Queue Length [ft/ln]	152.06	117.31	154.38	96.25	259.54	160.49	84.99	
95th-Percentile Queue Length [veh/ln]	10.13	8.25	10.25	6.93	15.67	10.57	6.12	
95th-Percentile Queue Length [ft/ln]	253.18	206.13	256.26	173.25	391.64	264.37	152.99	

**Movement, Approach, & Intersection Results**

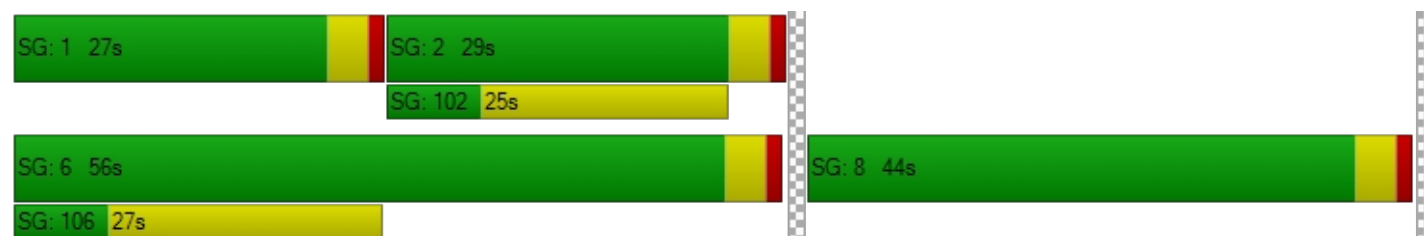
d_M, Delay for Movement [s/veh]	0.00	22.05	21.96	43.90	9.40	0.00	35.04	30.13	27.51	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	22.03			19.74			32.95			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	24.63											
Intersection LOS	C											
Intersection V/C	0.669											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.478			2.252		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.302			2.475			3.875			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	172	43	153	193	0	75	190	16	0	0	0
Total Analysis Volume [veh/h]	0	686	172	610	770	0	301	760	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	35	35	19	59	33	33	33	
g / C, Green / Cycle	0.35	0.35	0.19	0.59	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.15	0.16	0.17	0.20	0.30	0.28	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1347	638	682	2240	595	628	595	
d1, Uniform Delay [s]	24.52	24.77	39.26	10.57	31.85	31.00	23.22	
k, delay calibration	0.50	0.50	0.11	0.50	0.18	0.15	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.98	2.27	4.43	0.42	8.14	4.26	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.42	0.45	0.89	0.34	0.90	0.84	0.11	
d, Delay for Lane Group [s/veh]	25.50	27.04	43.69	10.99	39.99	35.26	23.29	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.25	5.52	7.62	4.25	13.27	12.20	1.04	
50th-Percentile Queue Length [ft/ln]	131.21	137.93	190.42	106.14	331.81	305.02	25.96	
95th-Percentile Queue Length [veh/ln]	9.01	9.37	12.14	7.62	19.25	17.93	1.87	
95th-Percentile Queue Length [ft/ln]	225.14	234.24	303.58	190.62	481.18	448.23	46.73	

**Movement, Approach, & Intersection Results**

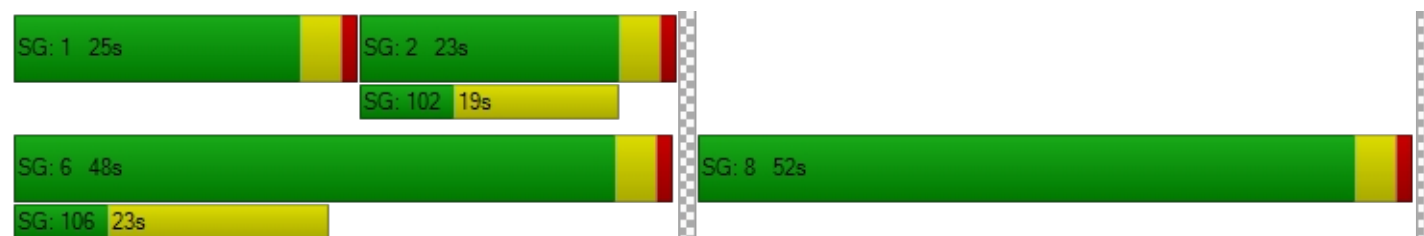
d_M, Delay for Movement [s/veh]	0.00	25.76	27.04	43.69	10.99	0.00	39.99	36.71	23.29	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	26.01			25.45			36.84			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.40											
Intersection LOS	C											
Intersection V/C	0.716											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.310			2.471		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.032			2.698			2.487			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX I-VI*




**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.746

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	26	0	34	0	234	169	96	228	0
Total Analysis Volume [veh/h]	0	0	0	103	0	136	0	934	675	385	913	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	14	0	0	49	0	47	96	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		10	10	62	62	26	92
g / C, Green / Cycle		0.09	0.09	0.57	0.57	0.23	0.84
(v / s)_i Volume / Saturation Flow Rate		0.06	0.08	0.25	0.38	0.21	0.24
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		164	164	2148	1018	422	3177
d1, Uniform Delay [s]		48.17	49.13	13.78	16.63	41.00	1.95
k, delay calibration		0.11	0.11	0.50	0.50	0.13	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.90	10.11	0.64	3.41	9.13	0.23
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.63	0.83	0.43	0.66	0.91	0.29
d, Delay for Lane Group [s/veh]		52.07	59.24	14.42	20.04	50.14	2.17
Lane Group LOS		D	E	B	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.90	4.12	6.63	12.19	11.11	1.37
50th-Percentile Queue Length [ft/ln]		72.42	103.06	165.70	304.74	277.83	34.37
95th-Percentile Queue Length [veh/ln]		5.21	7.42	10.85	17.92	16.58	2.47
95th-Percentile Queue Length [ft/ln]		130.35	185.51	271.26	447.89	414.51	61.86

**Movement, Approach, & Intersection Results**

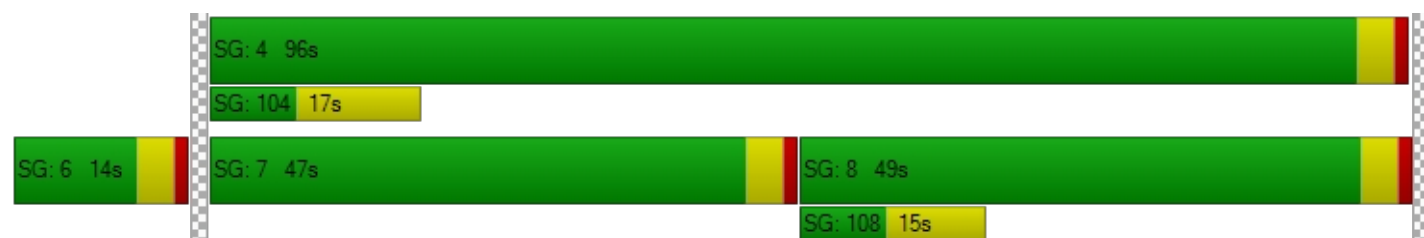
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	52.07	52.07	59.24	0.00	14.42	20.04	50.14	2.17	0.00
Movement LOS				D	D	E		B	C	D	A	
d_A, Approach Delay [s/veh]	0.00			56.15			16.78			16.40		
Approach LOS	A			E			B			B		
d_I, Intersection Delay [s/veh]	19.61											
Intersection LOS	B											
Intersection V/C	0.746											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.466	1.841	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	182	818	1673
d_b, Bicycle Delay [s]	55.00	45.45	19.20	1.47
I_b,int, Bicycle LOS Score for Intersection	4.132	1.954	2.445	2.630
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	122	0	108	0	0	0	90	181	0	0	208	38
Total Analysis Volume [veh/h]	489	0	430	0	0	0	358	724	0	0	833	150
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	56	0	0	0	0	0	35	54	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23		24	79	51	51
g / C, Green / Cycle	0.21	0.21	0.21		0.22	0.72	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.17		0.20	0.19	0.26	0.27
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	371	371	371		396	2740	883	837
d1, Uniform Delay [s]	41.86	41.76	41.64		41.78	5.29	21.24	21.66
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.98	4.71	4.36		7.91	0.24	2.52	3.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.84	0.83	0.81		0.91	0.26	0.56	0.59
d, Delay for Lane Group [s/veh]	46.84	46.47	46.00		49.70	5.52	23.76	24.67
Lane Group LOS	D	D	D		D	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	8.52	8.38	8.21		10.23	2.61	9.55	9.81
50th-Percentile Queue Length [ft/ln]	212.95	209.62	205.20		255.80	65.30	238.70	245.14
95th-Percentile Queue Length [veh/ln]	13.30	13.13	12.91		15.48	4.70	14.62	14.94
95th-Percentile Queue Length [ft/ln]	332.61	328.34	322.66		386.94	117.54	365.39	373.52

**Movement, Approach, & Intersection Results**

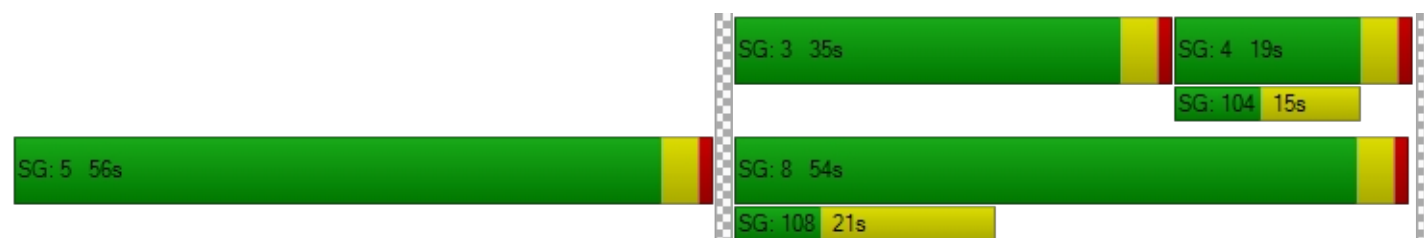
d_M, Delay for Movement [s/veh]	46.70	0.00	46.13	0.00	0.00	0.00	49.70	5.52	0.00	0.00	24.13	24.67
Movement LOS	D		D				D	A			C	C
d_A, Approach Delay [s/veh]	46.44			0.00			20.14			24.21		
Approach LOS	D			A			C			C		
d_I, Intersection Delay [s/veh]	29.58											
Intersection LOS	C											
Intersection V/C	0.723											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.248	1.928	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	909	273
d_b, Bicycle Delay [s]	55.00	55.00	16.36	41.02
I_b,int, Bicycle LOS Score for Intersection	5.649	4.132	2.452	2.371
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.807

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	412	0	0	377	184	0	0	0	55	126	118
Total Analysis Volume [veh/h]	112	1646	0	0	1509	734	0	0	0	219	503	473
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	62	52	52		30	30	30
g / C, Green / Cycle	0.06	0.62	0.52	0.52		0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.29	0.39	0.42		0.12	0.13	0.26
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	3522	1975	935		544	1148	544
d1, Uniform Delay [s]	45.81	10.26	19.03	19.74		27.73	28.07	33.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.30	0.45	2.77	7.11		0.48	0.26	4.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.55	0.47	0.76	0.80		0.40	0.44	0.87
d, Delay for Lane Group [s/veh]	48.11	10.71	21.80	26.84		28.21	28.33	37.48
Lane Group LOS	D	B	C	C		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.41	6.11	13.64	15.21		4.19	4.83	11.26
50th-Percentile Queue Length [ft/ln]	35.31	152.73	340.99	380.17		104.68	120.64	281.47
95th-Percentile Queue Length [veh/ln]	2.54	10.16	19.70	21.60		7.54	8.43	16.76
95th-Percentile Queue Length [ft/ln]	63.56	254.07	492.40	540.06		188.43	210.71	419.05

**Movement, Approach, & Intersection Results**

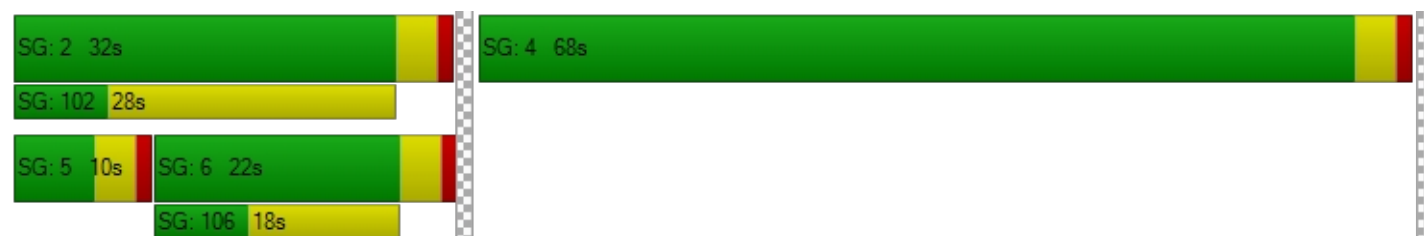
d_M, Delay for Movement [s/veh]	48.11	10.71	0.00	0.00	21.84	26.84	0.00	0.00	0.00	28.21	28.33	37.48
Movement LOS	D	B			C	C				C	C	D
d_A, Approach Delay [s/veh]	13.09			23.48			0.00			31.93		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	21.91											
Intersection LOS	C											
Intersection V/C	0.807											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.377			2.427		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.527			2.793			4.132			2.545		
Bicycle LOS	B			C			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.827

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	180	0	0	295	107	0	0	0	43	135	173
Total Analysis Volume [veh/h]	84	718	0	0	1180	426	0	0	0	171	540	690
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	40	40		42	42	42
g / C, Green / Cycle	0.06	0.50	0.40	0.40		0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.28	0.30		0.20	0.19	0.38
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2837	1510	715		760	802	760
d1, Uniform Delay [s]	46.31	14.44	25.29	25.85		20.85	20.48	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.18
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.03	0.21	2.84	7.05		0.46	0.38	7.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.25	0.71	0.75		0.47	0.44	0.91
d, Delay for Lane Group [s/veh]	57.34	14.65	28.13	32.90		21.31	20.85	34.15
Lane Group LOS	E	B	C	C		C	C	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.38	3.09	10.92	11.95		6.00	5.77	16.23
50th-Percentile Queue Length [ft/ln]	59.49	77.19	272.93	298.79		150.12	144.14	405.65
95th-Percentile Queue Length [veh/ln]	4.28	5.56	16.34	17.62		10.02	9.70	22.83
95th-Percentile Queue Length [ft/ln]	107.08	138.95	408.40	440.53		250.59	242.58	570.80

**Movement, Approach, & Intersection Results**

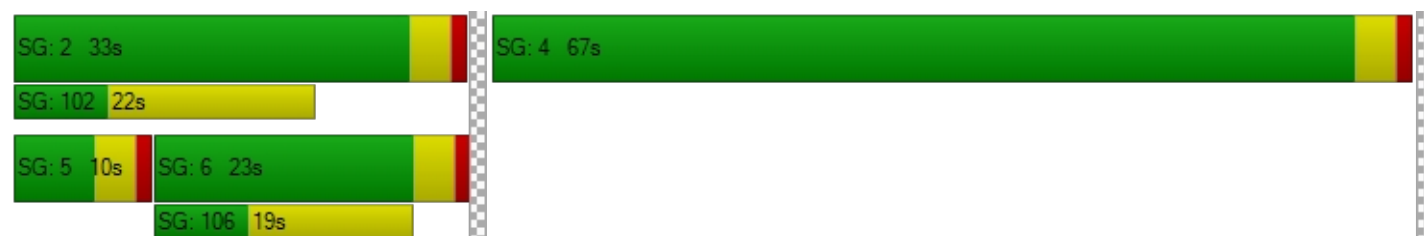
d_M, Delay for Movement [s/veh]	57.34	14.65	0.00	0.00	28.57	32.90	0.00	0.00	0.00	21.31	21.01	34.15
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	19.12			29.72			0.00			27.52		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	26.68											
Intersection LOS	C											
Intersection V/C	0.827											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.232			2.400		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	2.001			2.443			4.132			2.715		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	260	66	123	303	0	175	61	37	0	0	0
Total Analysis Volume [veh/h]	0	1039	262	491	1213	0	698	244	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	32	61	0	0	39	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	47	47	17	68	24	24	24	
g / C, Green / Cycle	0.47	0.47	0.17	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.14	0.21	0.20	0.13	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2700	853	588	3886	834	453	429	
d1, Uniform Delay [s]	16.94	16.21	40.26	6.44	36.23	33.28	31.59	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.93	3.21	0.21	2.32	1.00	0.47	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.38	0.31	0.84	0.31	0.84	0.54	0.34	
d, Delay for Lane Group [s/veh]	17.36	17.14	43.48	6.65	38.55	34.28	32.06	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.07	3.82	6.04	3.14	8.24	5.24	2.98	
50th-Percentile Queue Length [ft/ln]	126.83	95.47	150.99	78.39	205.88	131.04	74.54	
95th-Percentile Queue Length [veh/ln]	8.77	6.87	10.07	5.64	12.94	9.00	5.37	
95th-Percentile Queue Length [ft/ln]	219.18	171.84	251.75	141.11	323.53	224.91	134.17	

**Movement, Approach, & Intersection Results**

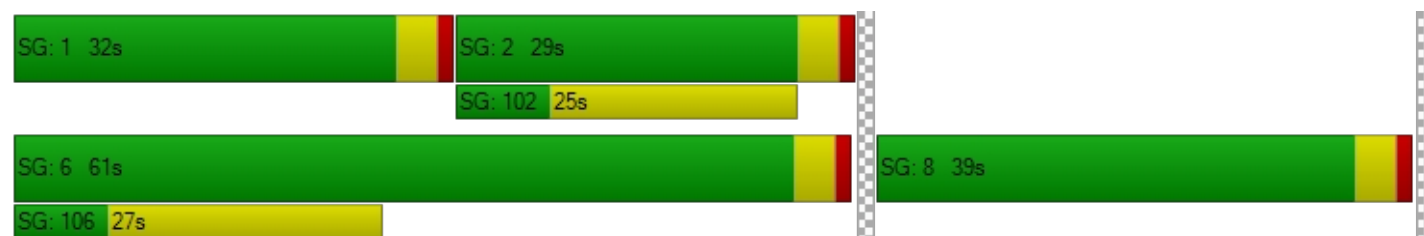
d_M, Delay for Movement [s/veh]	0.00	17.36	17.14	43.48	6.65	0.00	38.55	34.28	32.06	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	17.31			17.26			36.72			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	22.45											
Intersection LOS	C											
Intersection V/C	0.593											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.401			2.206		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1140			700			0		
d_b, Bicycle Delay [s]	28.13			9.25			21.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.497			3.356			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.672

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	146	45	157	195	0	54	187	15	0	0	0
Total Analysis Volume [veh/h]	0	584	179	629	778	0	214	749	58	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	27	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	20	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.20	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.18	0.20	0.27	0.25	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1423	674	709	2345	545	575	545	
d1, Uniform Delay [s]	22.58	22.78	38.76	9.22	33.29	32.45	25.11	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.70	1.61	4.00	0.38	7.39	3.65	0.08	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.38	0.89	0.33	0.89	0.83	0.11	
d, Delay for Lane Group [s/veh]	23.28	24.39	42.76	9.60	40.68	36.10	25.20	
Lane Group LOS	C	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.39	4.59	7.78	3.92	12.09	11.08	1.00	
50th-Percentile Queue Length [ft/ln]	109.82	114.80	194.54	97.88	302.27	277.06	25.02	
95th-Percentile Queue Length [veh/ln]	7.83	8.11	12.36	7.05	17.79	16.54	1.80	
95th-Percentile Queue Length [ft/ln]	195.75	202.66	308.91	176.19	444.84	413.54	45.03	

**Movement, Approach, & Intersection Results**

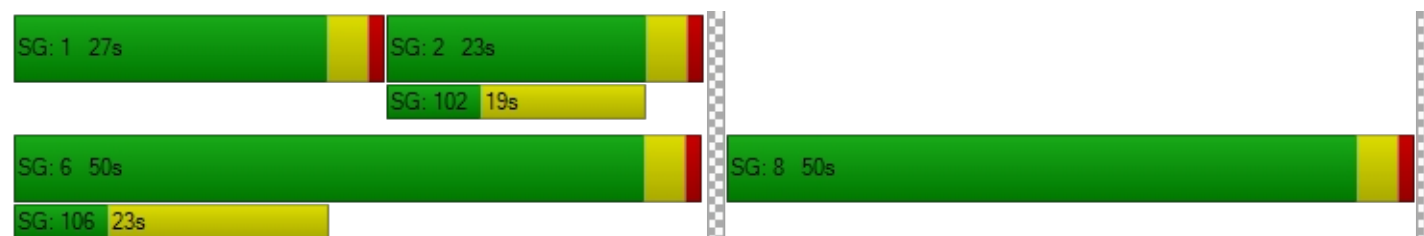
d_M, Delay for Movement [s/veh]	0.00	23.43	24.39	42.76	9.60	0.00	40.68	37.76	25.20	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	23.65			24.42			37.66			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.47											
Intersection LOS	C											
Intersection V/C	0.672											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.277			2.479		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			920			920			0		
d_b, Bicycle Delay [s]	32.81			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.979			2.720			2.402			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





## APPENDIX J

### YEAR 2030 BUILDOUT TRAFFIC CONDITIONS CALTRANS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

*APPENDIX J-1*

**YEAR 2030 BUILDOUT WEEKDAY  
PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.921

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	33	59	103	0	411	209	58	513	0
Total Analysis Volume [veh/h]	0	0	0	132	236	412	0	1642	834	231	2051	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	33	0	0	59	0	18	77	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		27	27	55	55	16	75
g / C, Green / Cycle		0.25	0.25	0.50	0.50	0.14	0.68
(v / s)_i Volume / Saturation Flow Rate		0.20	0.23	0.43	0.46	0.13	0.54
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		446	446	1898	899	259	2583
d1, Uniform Delay [s]		39.13	40.37	24.26	25.67	46.23	12.25
k, delay calibration		0.27	0.33	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		9.16	20.54	5.57	16.90	10.23	2.61
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.83	0.92	0.87	0.93	0.89	0.79
d, Delay for Lane Group [s/veh]		48.29	60.92	29.83	42.57	56.47	14.87
Lane Group LOS		D	E	C	D	E	B
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		10.43	13.28	19.40	23.50	6.91	16.32
50th-Percentile Queue Length [ft/ln]		260.80	332.08	485.00	587.40	172.63	407.93
95th-Percentile Queue Length [veh/ln]		15.73	19.26	26.62	31.45	11.21	22.94
95th-Percentile Queue Length [ft/ln]		393.23	481.51	665.59	786.14	280.37	573.55

**Movement, Approach, & Intersection Results**

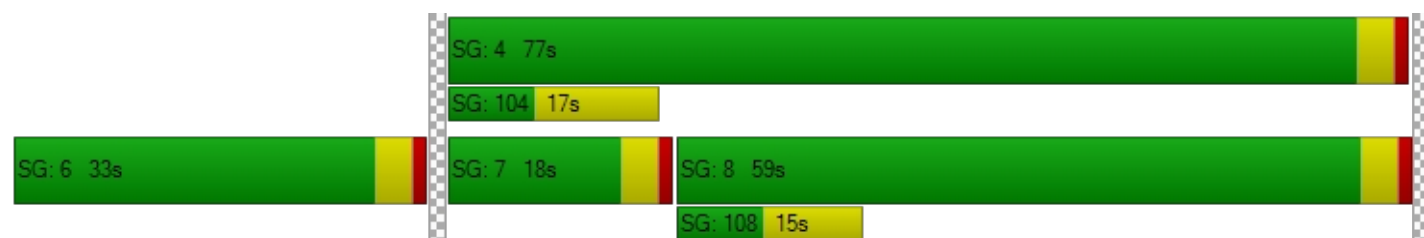
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	48.29	48.29	60.92	0.00	29.83	42.57	56.47	14.87	0.00
Movement LOS				D	D	E		C	D	E	B	
d_A, Approach Delay [s/veh]	0.00			54.96			34.12			19.08		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	30.86											
Intersection LOS	C											
Intersection V/C	0.921											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.701	2.105	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	527	1000	1327
d_b, Bicycle Delay [s]	55.00	29.82	13.75	6.22
I_b,int, Bicycle LOS Score for Intersection	4.132	2.847	2.921	3.442
Bicycle LOS	D	C	C	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	86.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.100

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	211	0	136	0	0	0	106	334	0	0	383	57
Total Analysis Volume [veh/h]	843	0	543	0	0	0	424	1334	0	0	1530	226
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	28	0	0	0	0	0	26	82	0	0	56	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		28	78	46	46
g / C, Green / Cycle	0.22	0.22	0.22		0.26	0.71	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.26		0.24	0.35	0.46	0.49
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	393	393	393		462	2693	790	749
d1, Uniform Delay [s]	42.97	42.97	42.97		39.76	7.19	32.11	32.11
k, delay calibration	0.41	0.41	0.41		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	98.70	98.70	98.70		7.82	0.65	66.93	91.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.17	1.17	1.17		0.92	0.50	1.11	1.17
d, Delay for Lane Group [s/veh]	141.67	141.67	141.67		47.59	7.84	99.05	123.67
Lane Group LOS	F	F	F		D	A	F	F
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	21.34	21.34	21.34		12.00	6.42	34.93	38.22
50th-Percentile Queue Length [ft/ln]	533.62	533.62	533.62		300.03	160.49	873.35	955.40
95th-Percentile Queue Length [veh/ln]	31.50	31.50	31.50		17.68	10.57	48.14	54.00
95th-Percentile Queue Length [ft/ln]	787.45	787.45	787.45		442.07	264.37	1203.60	1349.98

**Movement, Approach, & Intersection Results**

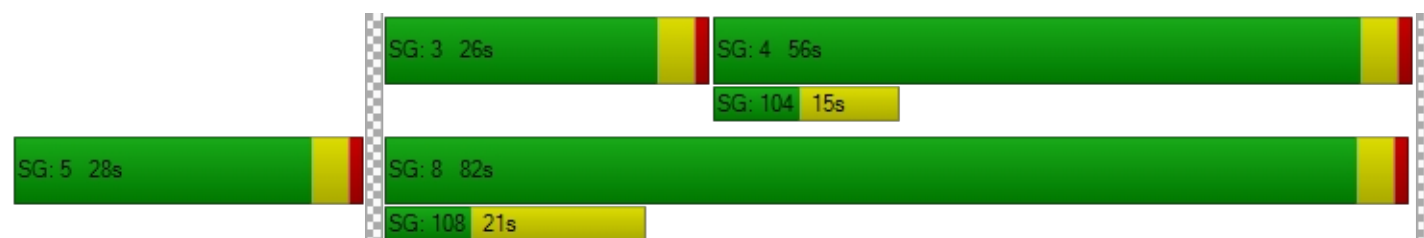
d_M, Delay for Movement [s/veh]	141.67	0.00	141.67	0.00	0.00	0.00	47.59	7.84	0.00	0.00	109.54	123.67
Movement LOS	F		F				D	A			F	F
d_A, Approach Delay [s/veh]	141.67			0.00			17.43			111.36		
Approach LOS	F			A			B			F		
d_I, Intersection Delay [s/veh]	86.23											
Intersection LOS	F											
Intersection V/C	1.100											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.400	2.067	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1418	945
d_b, Bicycle Delay [s]	55.00	55.00	4.65	15.29
I_b,int, Bicycle LOS Score for Intersection	6.419	4.132	3.010	3.008
Bicycle LOS	F	D	C	C

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	643	0	0	459	209	0	0	0	85	117	139
Total Analysis Volume [veh/h]	85	2571	0	0	1835	836	0	0	0	338	469	554
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	51	51		32	32	32
g / C, Green / Cycle	0.05	0.60	0.51	0.51		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.45	0.47	0.49		0.19	0.12	0.31
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	194	3421	1918	909		576	1216	576
d1, Uniform Delay [s]	45.74	14.57	23.07	24.26		28.48	26.39	33.41
k, delay calibration	0.11	0.50	0.50	0.50		0.15	0.11	0.43
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.57	9.40	25.36		1.32	0.20	26.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.75	0.93	0.98		0.59	0.39	0.96
d, Delay for Lane Group [s/veh]	47.30	16.14	32.48	49.63		29.79	26.59	59.89
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.06	13.34	20.70	25.53		6.87	4.32	17.05
50th-Percentile Queue Length [ft/ln]	26.50	333.48	517.51	638.35		171.79	107.90	426.14
95th-Percentile Queue Length [veh/ln]	1.91	19.33	28.16	33.82		11.17	7.72	23.82
95th-Percentile Queue Length [ft/ln]	47.70	483.23	704.05	845.53		279.26	193.08	595.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.30	16.14	0.00	0.00	32.99	49.63	0.00	0.00	0.00	29.79	26.59	59.89
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	17.13			38.19			0.00			40.94		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	30.39											
Intersection LOS	C											
Intersection V/C	0.939											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.397	2.468
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	1000	0	640
d_b, Bicycle Delay [s]	8.00	12.50	50.00	23.12
I_b,int, Bicycle LOS Score for Intersection	3.020	3.029	4.132	2.682
Bicycle LOS	C	C	D	B

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	40.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.016

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	381	0	0	383	105	0	0	0	46	195	212
Total Analysis Volume [veh/h]	111	1522	0	0	1531	421	0	0	0	184	780	847
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	50	0	0	40	0	0	0	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	46	36	36		46	46	46
g / C, Green / Cycle	0.06	0.46	0.36	0.36		0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.34	0.36		0.27	0.25	0.47
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2629	1369	649		826	872	826
d1, Uniform Delay [s]	46.96	19.80	31.12	31.99		20.13	19.51	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.16	0.12	0.48
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.94	15.06	36.14		1.02	0.60	37.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.58	0.95	1.00		0.59	0.54	1.03
d, Delay for Lane Group [s/veh]	89.94	20.74	46.17	68.13		21.16	20.11	64.60
Lane Group LOS	F	C	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	8.60	17.60	21.61		8.42	7.80	27.12
50th-Percentile Queue Length [ft/ln]	100.53	215.06	439.93	540.17		210.40	194.93	678.08
95th-Percentile Queue Length [veh/ln]	7.24	13.41	24.48	29.30		13.17	12.38	36.37
95th-Percentile Queue Length [ft/ln]	180.95	335.32	611.92	732.45		329.34	309.42	909.36

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	20.74	0.00	0.00	49.47	68.13	0.00	0.00	0.00	21.16	20.52	64.60
Movement LOS	F	C			D	E				C	C	F
d_A, Approach Delay [s/veh]	25.44			53.49			0.00			41.20		
Approach LOS	C			D			A			D		
d_I, Intersection Delay [s/veh]	40.88											
Intersection LOS	D											
Intersection V/C	1.016											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.359	2.534
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	920	720	0	920
d_b, Bicycle Delay [s]	14.58	20.48	50.00	14.58
I_b,int, Bicycle LOS Score for Intersection	2.458	2.633	4.132	3.054
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	429	59	114	443	0	253	92	40	0	0	0
Total Analysis Volume [veh/h]	0	1714	235	454	1771	0	1012	366	161	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	21	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	15	58	34	34	34	
g / C, Green / Cycle	0.39	0.39	0.15	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.30	0.13	0.13	0.31	0.29	0.19	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2243	708	527	3329	1176	638	605	
d1, Uniform Delay [s]	26.31	21.16	41.46	12.55	31.01	27.31	24.21	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.54	1.26	4.29	0.61	1.98	0.81	0.23	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.76	0.33	0.86	0.53	0.86	0.57	0.27	
d, Delay for Lane Group [s/veh]	28.85	22.42	45.75	13.17	32.99	28.12	24.44	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	11.93	4.02	5.72	7.62	11.40	7.20	2.79	
50th-Percentile Queue Length [ft/ln]	298.36	100.52	142.94	190.39	284.99	179.97	69.77	
95th-Percentile Queue Length [veh/ln]	17.60	7.24	9.64	12.14	16.94	11.60	5.02	
95th-Percentile Queue Length [ft/ln]	440.01	180.94	240.98	303.53	423.43	289.98	125.58	

**Movement, Approach, & Intersection Results**

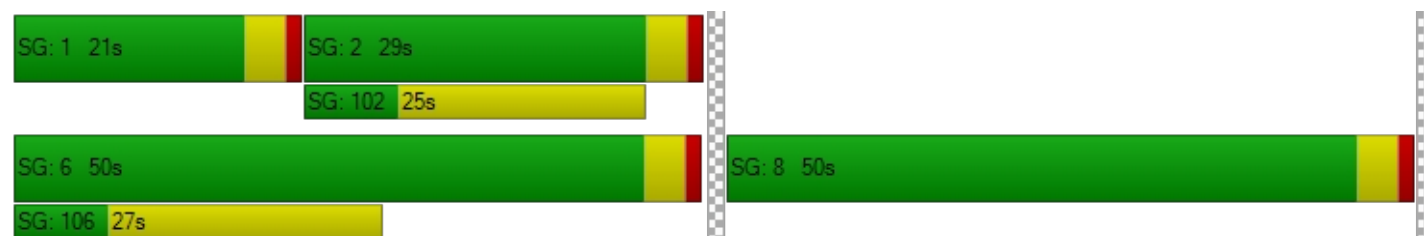
d_M, Delay for Movement [s/veh]	0.00	28.85	22.42	45.75	13.17	0.00	32.99	28.12	24.44	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	28.08			19.82			30.94			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.63											
Intersection LOS	C											
Intersection V/C	0.818											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.511			2.234		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			920			920			0		
d_b, Bicycle Delay [s]	28.13			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.632			2.783			4.099			4.132		
Bicycle LOS	B			C			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	308	58	148	272	0	100	153	16	0	0	0
Total Analysis Volume [veh/h]	0	1230	230	590	1089	0	398	610	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	38	38	19	61	31	31	31	
g / C, Green / Cycle	0.38	0.38	0.19	0.61	0.31	0.31	0.31	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.27	0.17	0.29	0.28	0.27	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1428	676	665	2302	566	597	566	
d1, Uniform Delay [s]	26.19	26.70	39.46	10.89	32.67	32.00	24.37	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.65	6.49	4.25	0.70	7.13	4.04	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.68	0.72	0.89	0.47	0.89	0.84	0.11	
d, Delay for Lane Group [s/veh]	28.84	33.19	43.71	11.59	39.80	36.04	24.46	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	9.98	10.86	7.35	6.38	12.45	11.74	1.07	
50th-Percentile Queue Length [ft/ln]	249.52	271.48	183.85	159.51	311.28	293.62	26.72	
95th-Percentile Queue Length [veh/ln]	15.16	16.26	11.80	10.52	18.24	17.37	1.92	
95th-Percentile Queue Length [ft/ln]	379.05	406.59	295.03	263.07	455.96	434.13	48.10	

**Movement, Approach, & Intersection Results**

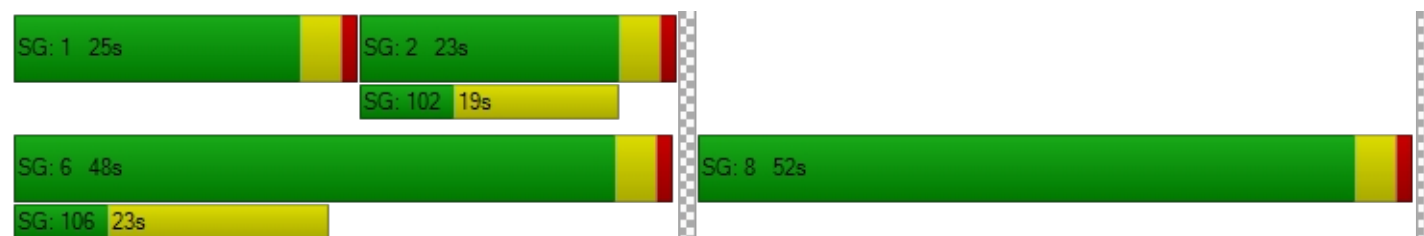
d_M, Delay for Movement [s/veh]	0.00	29.75	33.19	43.71	11.59	0.00	39.80	36.69	24.46	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	30.29			22.88			37.13			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.07											
Intersection LOS	C											
Intersection V/C	0.817											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.293			2.417		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.363			2.945			2.443			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX J-II*

**YEAR 2030 BUILDOUT SATURDAY  
ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**Control Type:  
Analysis Method:  
Analysis Period:Signalized  
HCM 6th Edition  
15 minutesDelay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):24.1  
C  
0.847**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	9	65	0	275	166	108	335	0
Total Analysis Volume [veh/h]	0	0	0	101	34	260	0	1101	665	433	1341	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	33	0	54	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		18	18	51	51	29	84
g / C, Green / Cycle		0.16	0.16	0.47	0.47	0.26	0.77
(v / s)_i Volume / Saturation Flow Rate		0.08	0.14	0.29	0.37	0.24	0.35
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		291	291	1778	842	471	2910
d1, Uniform Delay [s]		41.80	45.19	21.92	24.69	39.48	4.66
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.16	9.48	1.63	7.44	7.79	0.53
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.46	0.89	0.62	0.79	0.92	0.46
d, Delay for Lane Group [s/veh]		42.95	54.67	23.55	32.12	47.28	5.19
Lane Group LOS		D	D	C	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.41	7.67	10.77	15.84	12.24	4.64
50th-Percentile Queue Length [ft/ln]		85.28	191.85	269.21	396.10	305.91	115.94
95th-Percentile Queue Length [veh/ln]		6.14	12.22	16.15	22.37	17.97	8.17
95th-Percentile Queue Length [ft/ln]		153.51	305.43	403.76	559.30	449.33	204.23

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	42.95	42.95	54.67	0.00	23.55	32.12	47.28	5.19	0.00
Movement LOS				D	D	D		C	C	D	A	
d_A, Approach Delay [s/veh]	0.00			50.66			26.78			15.46		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	24.07											
Intersection LOS	C											
Intersection V/C	0.847											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.537	1.917	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	527	1509
d_b, Bicycle Delay [s]	55.00	37.64	29.82	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.211	2.531	3.023
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.852

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	147	0	109	0	0	0	98	218	0	0	278	39
Total Analysis Volume [veh/h]	589	0	436	0	0	0	391	872	0	0	1110	156
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	44	0	0	0	0	0	33	66	0	0	33	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25		26	77	47	47
g / C, Green / Cycle	0.22	0.22	0.22		0.24	0.70	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.19		0.22	0.23	0.33	0.35
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	404	404	404		429	2671	814	771
d1, Uniform Delay [s]	40.83	40.83	40.83		40.76	6.30	26.95	27.72
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.95	4.95	4.95		7.83	0.33	7.22	9.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.91	0.33	0.78	0.82
d, Delay for Lane Group [s/veh]	45.78	45.78	45.78		48.59	6.62	34.17	37.29
Lane Group LOS	D	D	D		D	A	C	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.33	9.33	9.33		11.12	3.63	15.48	16.29
50th-Percentile Queue Length [ft/ln]	233.28	233.28	233.28		277.88	90.64	386.96	407.28
95th-Percentile Queue Length [veh/ln]	14.34	14.34	14.34		16.58	6.53	21.93	22.91
95th-Percentile Queue Length [ft/ln]	358.53	358.53	358.53		414.57	163.15	548.26	572.76

**Movement, Approach, & Intersection Results**

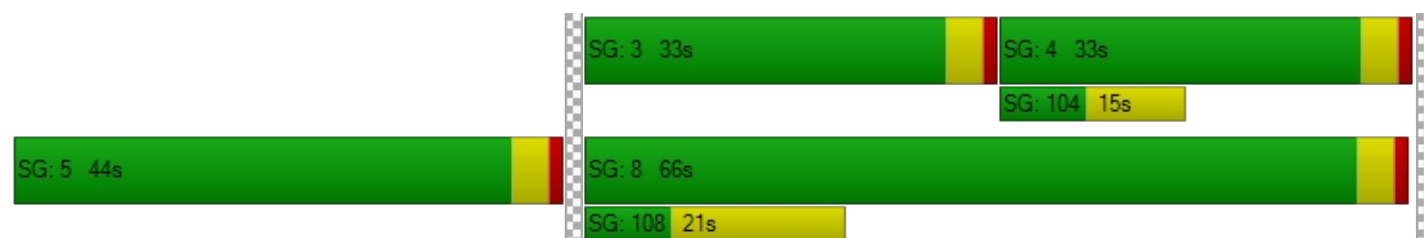
d_M, Delay for Movement [s/veh]	45.78	0.00	45.78	0.00	0.00	0.00	48.59	6.62	0.00	0.00	35.51	37.29
Movement LOS	D		D				D	A			D	D
d_A, Approach Delay [s/veh]	45.78			0.00			19.61			35.73		
Approach LOS	D			A			B			D		
d_I, Intersection Delay [s/veh]	32.90											
Intersection LOS	C											
Intersection V/C	0.852											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.283	1.966	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1127	527
d_b, Bicycle Delay [s]	55.00	55.00	10.47	29.82
I_b,int, Bicycle LOS Score for Intersection	5.824	4.132	2.602	2.604
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.950

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	523	0	0	433	234	0	0	0	59	105	126
Total Analysis Volume [veh/h]	123	2093	0	0	1730	936	0	0	0	237	419	505
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	67	0	0	57	0	0	0	0	0	33	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.04	0.37	0.46	0.52		0.13	0.11	0.28
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3591	2018	956		522	1102	522
d1, Uniform Delay [s]	45.89	10.82	20.19	22.91		29.03	28.33	35.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.74	0.70	4.98	24.51		0.62	0.22	28.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.58	0.86	0.98		0.45	0.38	0.97
d, Delay for Lane Group [s/veh]	48.63	11.52	25.16	47.43		29.65	28.55	63.26
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.56	8.38	17.48	26.26		4.69	4.00	15.91
50th-Percentile Queue Length [ft/ln]	39.04	209.60	437.02	656.58		117.14	99.95	397.81
95th-Percentile Queue Length [veh/ln]	2.81	13.13	24.34	34.67		8.24	7.20	22.45
95th-Percentile Queue Length [ft/ln]	70.28	328.32	608.44	866.69		205.88	179.91	561.37

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.63	11.52	0.00	0.00	25.16	47.43	0.00	0.00	0.00	29.65	28.55	63.26
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	13.58			32.98			0.00			43.87		
Approach LOS	B			C			A			D		
d_I, Intersection Delay [s/veh]	27.96											
Intersection LOS	C											
Intersection V/C	0.950											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.440			2.419		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1260			1060			0			580		
d_b, Bicycle Delay [s]	6.85			11.05			50.00			25.21		
I_b,int, Bicycle LOS Score for Intersection	2.778			3.026			4.132			2.517		
Bicycle LOS	C			C			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	48.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.040

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	266	0	0	343	97	0	0	0	36	176	237
Total Analysis Volume [veh/h]	111	1064	0	0	1371	389	0	0	0	144	702	949
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	45	0	0	35	0	0	0	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	41	31	31		51	51	51
g / C, Green / Cycle	0.06	0.41	0.31	0.31		0.51	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.06	0.19	0.31	0.33		0.24	0.22	0.53
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	109	2343	1180	559		916	967	916
d1, Uniform Delay [s]	46.98	21.32	34.38	34.47		15.85	15.43	24.55
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	45.21	0.64	24.84	51.66		0.38	0.30	39.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.02	0.45	0.99	1.05		0.47	0.43	1.04
d, Delay for Lane Group [s/veh]	92.19	21.96	59.22	86.13		16.22	15.73	63.83
Lane Group LOS	F	C	E	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.06	6.02	17.88	21.22		6.17	5.79	30.04
50th-Percentile Queue Length [ft/ln]	101.42	150.52	447.11	530.49		154.34	144.84	750.90
95th-Percentile Queue Length [veh/ln]	7.30	10.05	24.82	29.69		10.25	9.74	40.15
95th-Percentile Queue Length [ft/ln]	182.55	251.13	620.50	742.26		256.21	243.53	1003.74

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	92.19	21.96	0.00	0.00	63.10	86.13	0.00	0.00	0.00	16.22	15.93	63.83
Movement LOS	F	C			E	F				B	B	F
d_A, Approach Delay [s/veh]	28.60			68.19			0.00			41.28		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	48.14											
Intersection LOS	D											
Intersection V/C	1.040											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.306			2.528		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	820			620			0			1020		
d_b, Bicycle Delay [s]	17.41			23.81			50.00			12.01		
I_b,int, Bicycle LOS Score for Intersection	2.206			2.528			4.132			3.040		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.810

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	315	75	163	337	0	267	63	49	0	0	0
Total Analysis Volume [veh/h]	0	1259	299	652	1349	0	1069	253	197	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	31	0	27	58	0	0	42	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	33	33	21	58	34	34	34	
g / C, Green / Cycle	0.33	0.33	0.21	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.17	0.19	0.24	0.31	0.13	0.11	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	1889	596	729	3304	1191	647	613	
d1, Uniform Delay [s]	28.69	26.81	38.52	11.58	31.32	25.10	24.43	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.88	2.99	4.16	0.38	2.69	0.39	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.67	0.50	0.89	0.41	0.90	0.39	0.32	
d, Delay for Lane Group [s/veh]	30.58	29.80	42.68	11.95	34.01	25.48	24.73	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.78	6.12	8.08	5.30	12.33	4.58	3.47	
50th-Percentile Queue Length [ft/ln]	219.49	153.03	201.94	132.38	308.16	114.38	86.66	
95th-Percentile Queue Length [veh/ln]	13.64	10.18	12.74	9.07	18.08	8.08	6.24	
95th-Percentile Queue Length [ft/ln]	340.97	254.47	318.47	226.72	452.11	202.08	155.99	

**Movement, Approach, & Intersection Results**

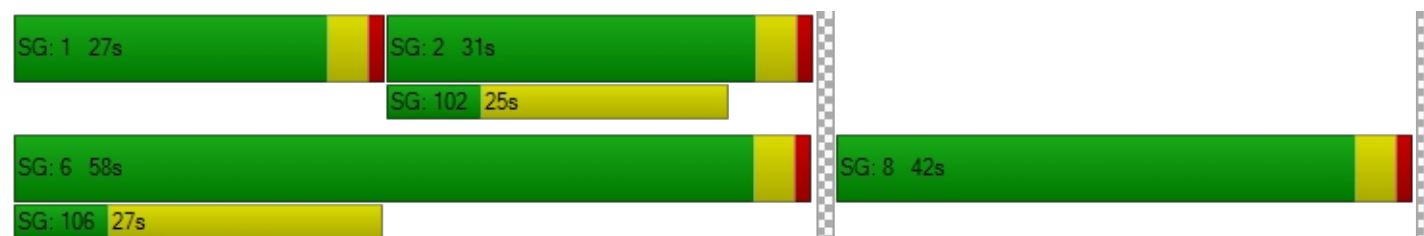
d_M, Delay for Movement [s/veh]	0.00	30.58	29.80	42.68	11.95	0.00	34.01	25.48	24.73	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	30.43			21.97			31.39			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	27.38											
Intersection LOS	C											
Intersection V/C	0.810											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.506			2.307		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	540			1080			760			0		
d_b, Bicycle Delay [s]	26.65			10.58			19.22			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.660			4.066			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	199	47	188	214	0	59	234	17	0	0	0
Total Analysis Volume [veh/h]	0	796	186	750	857	0	236	934	68	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	25	0	29	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	29	29	24	56	36	36	36	
g / C, Green / Cycle	0.29	0.29	0.24	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.17	0.18	0.21	0.23	0.33	0.30	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1088	515	823	2133	646	682	646	
d1, Uniform Delay [s]	30.78	31.14	37.24	12.43	30.62	29.56	21.37	
k, delay calibration	0.50	0.50	0.11	0.50	0.30	0.26	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.47	5.88	4.39	0.57	13.49	6.96	0.07	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.64	0.91	0.40	0.92	0.85	0.11	
d, Delay for Lane Group [s/veh]	33.25	37.02	41.63	12.99	44.11	36.52	21.44	
Lane Group LOS	C	D	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	7.07	7.62	9.27	5.31	15.57	13.74	1.07	
50th-Percentile Queue Length [ft/ln]	176.83	190.49	231.69	132.87	389.25	343.44	26.69	
95th-Percentile Queue Length [veh/ln]	11.43	12.15	14.26	9.10	22.04	19.82	1.92	
95th-Percentile Queue Length [ft/ln]	285.87	303.67	356.51	227.39	551.03	495.40	48.05	

**Movement, Approach, & Intersection Results**

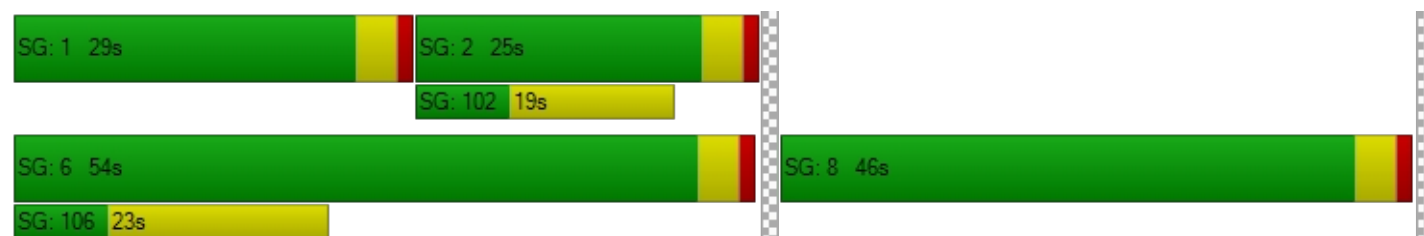
d_M, Delay for Movement [s/veh]	0.00	33.92	37.02	41.63	12.99	0.00	44.11	39.41	21.44	0.00	0.00	0.00
Movement LOS		C	D	D	B		D	D	C			
d_A, Approach Delay [s/veh]	34.51			26.36			39.32			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	32.64											
Intersection LOS	C											
Intersection V/C	0.824											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.347			2.631		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	420			1000			840			0		
d_b, Bicycle Delay [s]	31.21			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.100			2.885			2.581			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX J-III*

**YEAR 2030 BUILDOUT SATURDAY  
DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.849

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	28	9	66	0	279	170	105	298	0
Total Analysis Volume [veh/h]	0	0	0	111	34	263	0	1114	678	420	1191	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	23	0	0	34	0	53	87	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		18	18	52	52	28	84
g / C, Green / Cycle		0.16	0.16	0.47	0.47	0.25	0.76
(v / s)_i Volume / Saturation Flow Rate		0.08	0.15	0.29	0.38	0.23	0.31
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		293	293	1800	853	458	2904
d1, Uniform Delay [s]		41.90	45.12	21.55	24.43	39.89	4.45
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.29	9.67	1.61	7.57	7.83	0.43
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.49	0.90	0.62	0.80	0.92	0.41
d, Delay for Lane Group [s/veh]		43.19	54.78	23.16	32.01	47.72	4.88
Lane Group LOS		D	D	C	C	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.68	7.78	10.80	16.15	11.90	3.92
50th-Percentile Queue Length [ft/ln]		92.08	194.39	270.04	403.71	297.40	97.93
95th-Percentile Queue Length [veh/ln]		6.63	12.35	16.19	22.74	17.55	7.05
95th-Percentile Queue Length [ft/ln]		165.74	308.72	404.80	568.47	438.81	176.28

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	43.19	43.19	54.78	0.00	23.16	32.01	47.72	4.88	0.00
Movement LOS				D	D	D		C	C	D	A	
d_A, Approach Delay [s/veh]	0.00			50.66			26.50			16.05		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	24.67											
Intersection LOS	C											
Intersection V/C	0.849											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.537	1.923	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	345	545	1509
d_b, Bicycle Delay [s]	55.00	37.64	29.09	3.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.233	2.545	2.889
Bicycle LOS	D	B	B	C

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	0	118	0	0	0	104	215	0	0	254	41
Total Analysis Volume [veh/h]	622	0	470	0	0	0	417	858	0	0	1015	163
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	47	0	0	0	0	0	44	63	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26		28	76	44	44
g / C, Green / Cycle	0.24	0.24	0.24		0.25	0.69	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.20	0.20	0.20		0.23	0.23	0.31	0.33
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	429	429	429		455	2619	760	720
d1, Uniform Delay [s]	40.01	40.01	40.01		39.95	6.86	28.69	29.43
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.78	4.78	4.78		7.76	0.33	7.59	10.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.92	0.33	0.78	0.82
d, Delay for Lane Group [s/veh]	44.78	44.78	44.78		47.71	7.20	36.29	39.45
Lane Group LOS	D	D	D		D	A	D	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.87	9.87	9.87		11.80	3.79	14.79	15.53
50th-Percentile Queue Length [ft/ln]	246.80	246.80	246.80		295.07	94.68	369.86	388.33
95th-Percentile Queue Length [veh/ln]	15.02	15.02	15.02		17.44	6.82	21.10	22.00
95th-Percentile Queue Length [ft/ln]	375.62	375.62	375.62		435.93	170.43	527.56	549.92

**Movement, Approach, & Intersection Results**

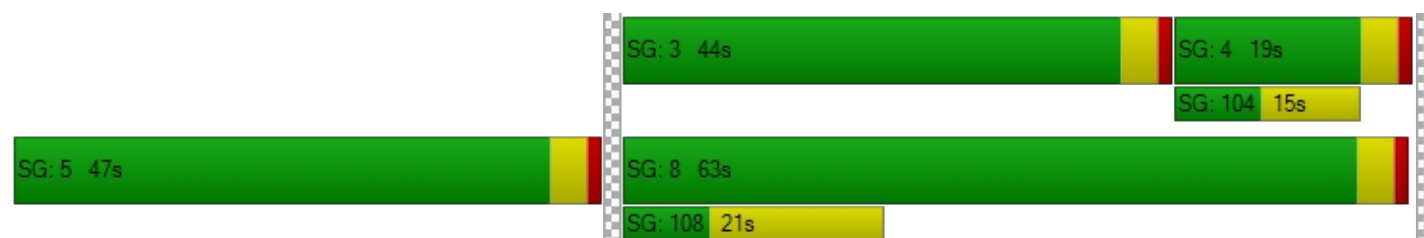
d_M, Delay for Movement [s/veh]	44.78	0.00	44.78	0.00	0.00	0.00	47.71	7.20	0.00	0.00	37.62	39.45
Movement LOS	D		D				D	A			D	D
d_A, Approach Delay [s/veh]	44.78			0.00			20.45			37.87		
Approach LOS	D			A			C			D		
d_I, Intersection Delay [s/veh]	33.73											
Intersection LOS	C											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.305	1.998	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1073	273
d_b, Bicycle Delay [s]	55.00	55.00	11.82	41.02
I_b,int, Bicycle LOS Score for Intersection	5.934	4.132	2.611	2.531
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.995

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	522	0	0	445	224	0	0	0	60	108	155
Total Analysis Volume [veh/h]	121	2086	0	0	1780	894	0	0	0	238	431	620
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	62	0	0	52	0	0	0	0	0	38	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	58	48	48		34	34	34
g / C, Green / Cycle	0.06	0.58	0.48	0.48		0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.47	0.50		0.13	0.11	0.34
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3307	1829	866		612	1291	612
d1, Uniform Delay [s]	45.88	13.90	25.31	25.94		25.11	24.58	33.01
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.65	0.92	15.59	39.05		0.40	0.15	38.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.63	0.97	1.03		0.39	0.33	1.01
d, Delay for Lane Group [s/veh]	48.53	14.82	40.89	64.98		25.52	24.73	71.58
Lane Group LOS	D	B	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.53	9.91	23.24	28.63		4.31	3.78	20.87
50th-Percentile Queue Length [ft/ln]	38.36	247.81	580.89	715.73		107.67	94.58	521.77
95th-Percentile Queue Length [veh/ln]	2.76	15.08	31.14	38.34		7.71	6.81	28.63
95th-Percentile Queue Length [ft/ln]	69.04	376.89	778.52	958.57		192.75	170.24	715.71

**Movement, Approach, & Intersection Results**

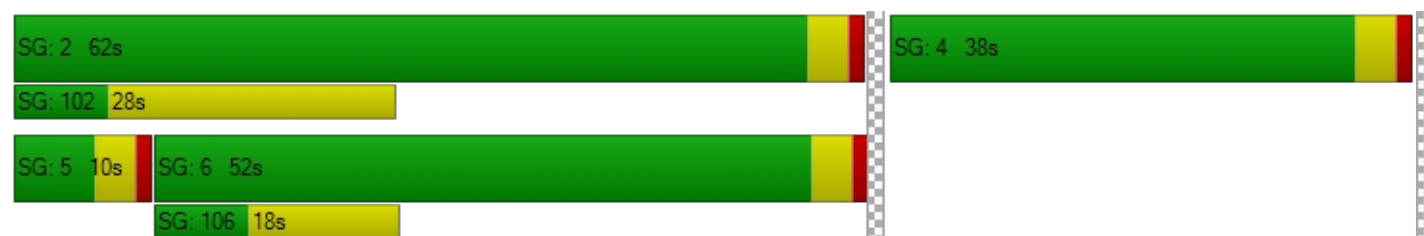
d_M, Delay for Movement [s/veh]	48.53	14.82	0.00	0.00	40.89	64.98	0.00	0.00	0.00	25.52	24.73	71.58
Movement LOS	D	B			D	F				C	C	F
d_A, Approach Delay [s/veh]	16.67			48.95			0.00			47.41		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	37.08											
Intersection LOS	D											
Intersection V/C	0.995											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.425	2.450
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1160	960	0	680
d_b, Bicycle Delay [s]	8.82	13.52	50.00	21.78
I_b,int, Bicycle LOS Score for Intersection	2.773	3.030	4.132	2.623
Bicycle LOS	C	C	D	B

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	36.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.947

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	224	0	0	321	87	0	0	0	46	173	216
Total Analysis Volume [veh/h]	91	894	0	0	1285	347	0	0	0	185	692	865
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	44	0	0	34	0	0	0	0	0	56	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	42	32	32		50	50	50
g / C, Green / Cycle	0.06	0.42	0.32	0.32		0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.05	0.16	0.29	0.30		0.25	0.23	0.48
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	111	2380	1200	568		904	955	904
d1, Uniform Delay [s]	46.36	20.12	32.81	33.56		16.45	16.02	23.83
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.41
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	13.44	0.45	11.47	28.56		0.42	0.34	18.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.38	0.91	0.96		0.49	0.45	0.96
d, Delay for Lane Group [s/veh]	59.79	20.57	44.28	62.11		16.87	16.35	42.40
Lane Group LOS	E	C	D	E		B	B	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.64	4.80	14.19	17.07		6.58	6.19	22.86
50th-Percentile Queue Length [ft/ln]	65.99	120.07	354.78	426.68		164.41	154.69	571.55
95th-Percentile Queue Length [veh/ln]	4.75	8.40	20.37	23.84		10.78	10.27	30.70
95th-Percentile Queue Length [ft/ln]	118.77	209.93	509.23	596.06		269.56	256.67	767.59

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.79	20.57	0.00	0.00	47.02	62.11	0.00	0.00	0.00	16.87	16.55	42.40
Movement LOS	E	C			D	E				B	B	D
d_A, Approach Delay [s/veh]	24.20			50.23			0.00			29.42		
Approach LOS	C			D			A			C		
d_I, Intersection Delay [s/veh]	36.03											
Intersection LOS	D											
Intersection V/C	0.947											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.271	2.511
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	600	0	1040
d_b, Bicycle Delay [s]	18.00	24.50	50.00	11.52
I_b,int, Bicycle LOS Score for Intersection	2.101	2.457	4.132	2.997
Bicycle LOS	B	B	D	C

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.759

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	317	71	161	337	0	229	70	40	0	0	0
Total Analysis Volume [veh/h]	0	1268	284	643	1348	0	917	281	160	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	31	60	0	0	40	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	21	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.21	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.18	0.24	0.26	0.15	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2107	665	737	3536	1049	569	539	
d1, Uniform Delay [s]	25.55	23.59	38.17	9.44	33.23	28.78	26.91	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.28	2.00	3.40	0.31	2.47	0.66	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.43	0.87	0.38	0.87	0.49	0.30	
d, Delay for Lane Group [s/veh]	26.83	25.59	41.57	9.76	35.70	29.44	27.22	
Lane Group LOS	C	C	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.20	5.30	7.85	4.61	10.65	5.57	2.96	
50th-Percentile Queue Length [ft/ln]	204.98	132.51	196.23	115.31	266.35	139.23	73.88	
95th-Percentile Queue Length [veh/ln]	12.90	9.08	12.44	8.13	16.01	9.44	5.32	
95th-Percentile Queue Length [ft/ln]	322.39	226.91	311.10	203.36	400.17	235.98	132.99	

**Movement, Approach, & Intersection Results**

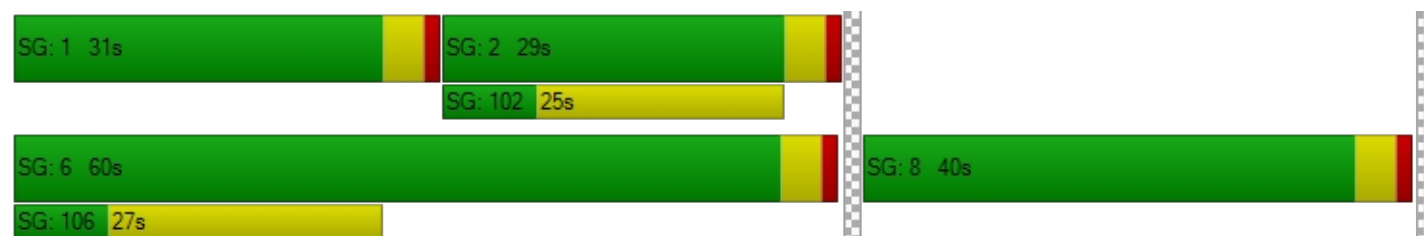
d_M, Delay for Movement [s/veh]	0.00	26.83	25.59	41.57	9.76	0.00	35.70	29.44	27.22	0.00	0.00	0.00
Movement LOS		C	C	D	A		D	C	C			
d_A, Approach Delay [s/veh]	26.61			20.03			33.40			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	25.82											
Intersection LOS	C											
Intersection V/C	0.759											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.467			2.309		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1120			720			0		
d_b, Bicycle Delay [s]	28.13			9.68			20.48			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.413			2.655			3.800			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	183	49	180	203	0	62	231	16	0	0	0
Total Analysis Volume [veh/h]	0	731	194	719	813	0	248	922	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	29	52	0	0	48	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	29	29	23	56	36	36	36	
g / C, Green / Cycle	0.29	0.29	0.23	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.17	0.21	0.21	0.33	0.30	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1110	526	797	2127	648	684	648	
d1, Uniform Delay [s]	29.92	30.25	37.53	12.33	30.47	29.43	21.21	
k, delay calibration	0.50	0.50	0.11	0.50	0.28	0.24	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.01	4.74	4.10	0.52	12.11	6.23	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.56	0.59	0.90	0.38	0.91	0.85	0.10	
d, Delay for Lane Group [s/veh]	31.93	34.99	41.62	12.85	42.59	35.66	21.27	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.49	6.94	8.85	4.99	15.29	13.58	0.98	
50th-Percentile Queue Length [ft/ln]	162.16	173.40	221.37	124.67	382.14	339.47	24.59	
95th-Percentile Queue Length [veh/ln]	10.66	11.26	13.74	8.65	21.70	19.62	1.77	
95th-Percentile Queue Length [ft/ln]	266.59	281.38	343.38	216.23	542.44	490.55	44.26	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	32.41	34.99	41.62	12.85	0.00	42.59	38.24	21.27	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	32.95			26.35			38.25			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	31.98											
Intersection LOS	C											
Intersection V/C	0.801											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.346			2.614		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			960			880			0		
d_b, Bicycle Delay [s]	32.81			13.52			15.68			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.068			2.824			2.577			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






*APPENDIX J-IV*

**YEAR 2030 BUILDOUT PLUS PROJECT  
WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.924

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	33	59	104	0	411	209	58	515	0
Total Analysis Volume [veh/h]	0	0	0	132	236	417	0	1642	834	231	2060	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	33	0	0	59	0	18	77	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		27	27	55	55	16	75
g / C, Green / Cycle		0.25	0.25	0.50	0.50	0.14	0.68
(v / s)_i Volume / Saturation Flow Rate		0.20	0.23	0.43	0.46	0.13	0.54
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		450	450	1896	898	256	2574
d1, Uniform Delay [s]		38.90	40.28	24.30	25.71	46.43	12.49
k, delay calibration		0.27	0.34	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		8.71	21.15	5.60	17.00	11.30	2.72
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.82	0.93	0.87	0.93	0.90	0.80
d, Delay for Lane Group [s/veh]		47.61	61.43	29.90	42.71	57.73	15.21
Lane Group LOS		D	E	C	D	E	B
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		10.36	13.51	19.42	23.53	6.99	16.65
50th-Percentile Queue Length [ft/ln]		258.88	337.87	485.39	588.18	174.69	416.30
95th-Percentile Queue Length [veh/ln]		15.63	19.54	26.64	31.48	11.32	23.34
95th-Percentile Queue Length [ft/ln]		390.81	488.59	666.05	787.05	283.07	583.60



**Movement, Approach, & Intersection Results**

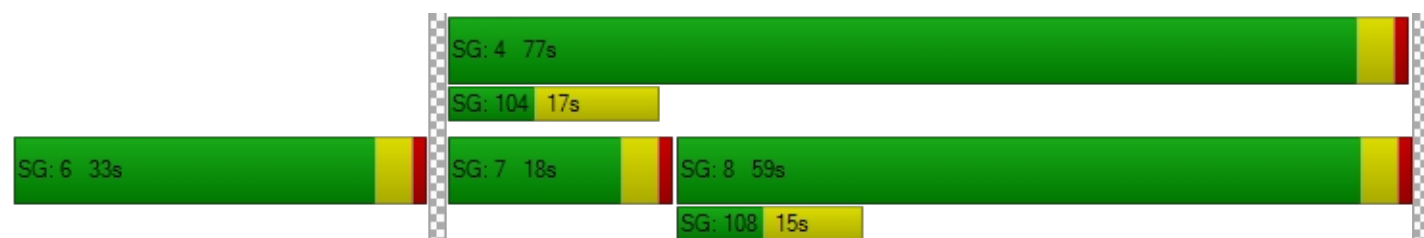
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	47.61	47.61	61.43	0.00	29.90	42.71	57.73	15.21	0.00
Movement LOS				D	D	E		C	D	E	B	
d_A, Approach Delay [s/veh]	0.00			54.95			34.22			19.50		
Approach LOS	A			D			C			B		
d_I, Intersection Delay [s/veh]	31.07											
Intersection LOS	C											
Intersection V/C	0.924											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.701			2.107			0.000			0.000		
Crosswalk LOS	B			B			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			527			1000			1327		
d_b, Bicycle Delay [s]	55.00			29.82			13.75			6.22		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.855			2.921			3.450		
Bicycle LOS	D			C			C			C		

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	87.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.102

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	212	0	136	0	0	0	106	334	0	0	384	57
Total Analysis Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	28	0	0	0	0	0	26	82	0	0	56	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24		28	78	46	46
g / C, Green / Cycle	0.22	0.22	0.22		0.26	0.71	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.26		0.24	0.35	0.46	0.49
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	393	393	393		462	2693	790	749
d1, Uniform Delay [s]	42.97	42.97	42.97		39.76	7.19	32.11	32.11
k, delay calibration	0.41	0.41	0.41		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	99.74	99.74	99.74		7.82	0.65	68.11	92.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.18	1.18	1.18		0.92	0.50	1.11	1.18
d, Delay for Lane Group [s/veh]	142.72	142.72	142.72		47.59	7.84	100.22	125.01
Lane Group LOS	F	F	F		D	A	F	F
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	21.46	21.46	21.46		12.00	6.42	35.19	38.49
50th-Percentile Queue Length [ft/ln]	536.48	536.48	536.48		300.03	160.49	879.81	962.37
95th-Percentile Queue Length [veh/ln]	31.68	31.68	31.68		17.68	10.57	48.55	54.45
95th-Percentile Queue Length [ft/ln]	791.95	791.95	791.95		442.07	264.37	1213.85	1361.20

**Movement, Approach, & Intersection Results**

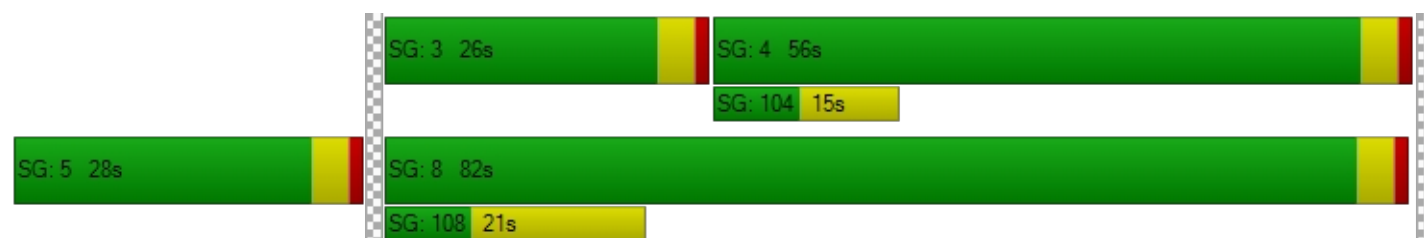
d_M, Delay for Movement [s/veh]	142.72	0.00	142.72	0.00	0.00	0.00	47.59	7.84	0.00	0.00	110.79	125.01
Movement LOS	F		F				D	A			F	F
d_A, Approach Delay [s/veh]	142.72			0.00			17.43			112.62		
Approach LOS	F			A			B			F		
d_I, Intersection Delay [s/veh]	87.04											
Intersection LOS	F											
Intersection V/C	1.102											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.401	2.067	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1418	945
d_b, Bicycle Delay [s]	55.00	55.00	4.65	15.29
I_b,int, Bicycle LOS Score for Intersection	6.424	4.132	3.010	3.012
Bicycle LOS	F	D	C	C

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	644	0	0	459	209	0	0	0	85	117	139
Total Analysis Volume [veh/h]	85	2577	0	0	1835	836	0	0	0	338	469	554
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	51	51		32	32	32
g / C, Green / Cycle	0.05	0.60	0.51	0.51		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.45	0.47	0.49		0.19	0.12	0.31
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	194	3421	1918	909		576	1216	576
d1, Uniform Delay [s]	45.74	14.59	23.07	24.26		28.48	26.39	33.41
k, delay calibration	0.11	0.50	0.50	0.50		0.15	0.11	0.43
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	1.58	9.40	25.36		1.32	0.20	26.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.44	0.75	0.93	0.98		0.59	0.39	0.96
d, Delay for Lane Group [s/veh]	47.30	16.18	32.48	49.63		29.79	26.59	59.89
Lane Group LOS	D	B	C	D		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.06	13.40	20.70	25.53		6.87	4.32	17.05
50th-Percentile Queue Length [ft/ln]	26.50	334.96	517.51	638.35		171.79	107.90	426.14
95th-Percentile Queue Length [veh/ln]	1.91	19.40	28.16	33.82		11.17	7.72	23.82
95th-Percentile Queue Length [ft/ln]	47.70	485.04	704.05	845.53		279.26	193.08	595.42



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	47.30	16.18	0.00	0.00	32.99	49.63	0.00	0.00	0.00	29.79	26.59	59.89
Movement LOS	D	B			C	D				C	C	E
d_A, Approach Delay [s/veh]	17.17			38.19			0.00			40.94		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	30.39											
Intersection LOS	C											
Intersection V/C	0.939											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.397	2.468
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	1000	0	640
d_b, Bicycle Delay [s]	8.00	12.50	50.00	23.12
I_b,int, Bicycle LOS Score for Intersection	3.024	3.029	4.132	2.682
Bicycle LOS	C	C	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	41.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.017

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	382	0	0	383	105	0	0	0	46	195	213
Total Analysis Volume [veh/h]	111	1529	0	0	1531	421	0	0	0	184	780	850
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	50	0	0	40	0	0	0	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	46	36	36		46	46	46
g / C, Green / Cycle	0.06	0.46	0.36	0.36		0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.34	0.36		0.27	0.25	0.47
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2629	1369	649		826	872	826
d1, Uniform Delay [s]	46.96	19.84	31.12	31.99		20.13	19.51	27.06
k, delay calibration	0.11	0.50	0.50	0.50		0.16	0.12	0.49
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.95	15.06	36.14		1.02	0.60	38.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.58	0.95	1.00		0.59	0.54	1.03
d, Delay for Lane Group [s/veh]	89.94	20.78	46.18	68.13		21.16	20.11	65.72
Lane Group LOS	F	C	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	8.66	17.60	21.61		8.42	7.80	27.38
50th-Percentile Queue Length [ft/ln]	100.53	216.44	439.94	540.18		210.41	194.92	684.48
95th-Percentile Queue Length [veh/ln]	7.24	13.48	24.48	29.30		13.17	12.38	36.78
95th-Percentile Queue Length [ft/ln]	180.95	337.08	611.93	732.46		329.36	309.40	919.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	20.78	0.00	0.00	49.47	68.13	0.00	0.00	0.00	21.16	20.52	65.72
Movement LOS	F	C			D	E				C	C	F
d_A, Approach Delay [s/veh]	25.46			53.49			0.00			41.76		
Approach LOS	C			D			A			D		
d_I, Intersection Delay [s/veh]	41.05											
Intersection LOS	D											
Intersection V/C	1.017											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.359			2.535		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	920			720			0			920		
d_b, Bicycle Delay [s]	14.58			20.48			50.00			14.58		
I_b,int, Bicycle LOS Score for Intersection	2.462			2.633			4.132			3.056		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	429	59	114	443	0	254	93	40	0	0	0
Total Analysis Volume [veh/h]	0	1717	235	454	1771	0	1015	370	161	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	21	50	0	0	50	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	39	39	15	58	34	34	34	
g / C, Green / Cycle	0.39	0.39	0.15	0.58	0.34	0.34	0.34	
(v / s)_i Volume / Saturation Flow Rate	0.30	0.13	0.13	0.31	0.29	0.19	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2237	706	527	3323	1179	640	606	
d1, Uniform Delay [s]	26.41	21.23	41.46	12.61	30.96	27.30	24.14	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.59	1.26	4.29	0.62	1.98	0.83	0.23	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.77	0.33	0.86	0.53	0.86	0.58	0.27	
d, Delay for Lane Group [s/veh]	29.00	22.49	45.75	13.23	32.94	28.13	24.38	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	11.99	4.03	5.72	7.64	11.43	7.29	2.79	
50th-Percentile Queue Length [ft/ln]	299.83	100.72	142.94	190.96	285.70	182.14	69.65	
95th-Percentile Queue Length [veh/ln]	17.67	7.25	9.64	12.17	16.97	11.71	5.01	
95th-Percentile Queue Length [ft/ln]	441.82	181.30	240.98	304.27	424.30	292.80	125.36	



**Movement, Approach, & Intersection Results**

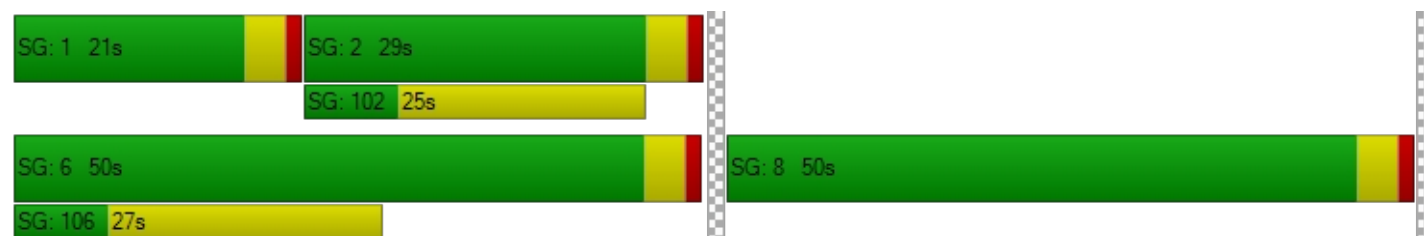
d_M, Delay for Movement [s/veh]	0.00	29.00	22.49	45.75	13.23	0.00	32.94	28.13	24.38	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	28.22			19.86			30.90			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.69											
Intersection LOS	C											
Intersection V/C	0.819											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.513			2.236		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			920			920			0		
d_b, Bicycle Delay [s]	28.13			14.58			14.58			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.633			2.783			4.111			4.132		
Bicycle LOS	B			C			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.819

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	308	58	148	272	0	101	153	16	0	0	0
Total Analysis Volume [veh/h]	0	1233	230	590	1089	0	402	610	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	19	60	32	32	32	
g / C, Green / Cycle	0.37	0.37	0.19	0.60	0.32	0.32	0.32	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.27	0.17	0.29	0.28	0.27	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1424	674	665	2298	568	599	568	
d1, Uniform Delay [s]	26.30	26.82	39.46	10.95	32.62	31.94	24.29	
k, delay calibration	0.50	0.50	0.11	0.50	0.16	0.13	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.70	6.62	4.25	0.70	7.19	4.09	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.68	0.72	0.89	0.47	0.89	0.84	0.11	
d, Delay for Lane Group [s/veh]	29.00	33.43	43.71	11.66	39.81	36.03	24.38	
Lane Group LOS	C	C	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	10.04	10.93	7.35	6.40	12.50	11.80	1.07	
50th-Percentile Queue Length [ft/ln]	250.88	273.18	183.85	160.12	312.61	294.88	26.67	
95th-Percentile Queue Length [veh/ln]	15.23	16.35	11.80	10.56	18.30	17.43	1.92	
95th-Percentile Queue Length [ft/ln]	380.77	408.71	295.03	263.88	457.59	435.69	48.01	

**Movement, Approach, & Intersection Results**

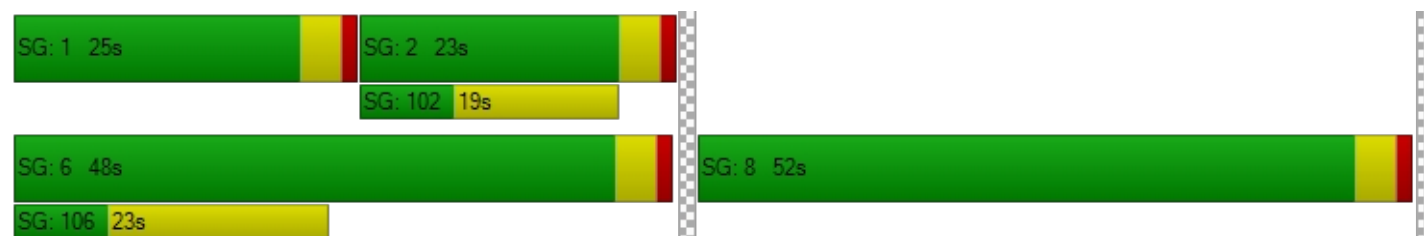
d_M, Delay for Movement [s/veh]	0.00	29.93	33.43	43.71	11.66	0.00	39.81	36.67	24.38	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	D	C			
d_A, Approach Delay [s/veh]	30.48			22.92			37.12			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	29.16											
Intersection LOS	C											
Intersection V/C	0.819											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.294			2.417		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.364			2.945			2.446			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





*APPENDIX J-V*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.955

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	25	9	96	0	289	179	108	403	0
Total Analysis Volume [veh/h]	0	0	0	101	34	383	0	1157	715	433	1611	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	29	0	0	49	0	32	81	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		25	25	45	45	28	77
g / C, Green / Cycle		0.23	0.23	0.41	0.41	0.25	0.70
(v / s)_i Volume / Saturation Flow Rate		0.08	0.21	0.30	0.40	0.24	0.42
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		409	409	1557	737	458	2661
d1, Uniform Delay [s]		35.52	41.74	27.55	31.79	40.27	8.58
k, delay calibration		0.11	0.29	0.50	0.50	0.36	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.47	21.60	3.26	26.51	24.86	1.03
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.33	0.94	0.74	0.97	0.95	0.61
d, Delay for Lane Group [s/veh]		35.99	63.34	30.81	58.30	65.12	9.61
Lane Group LOS		D	E	C	E	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.08	12.54	13.31	23.41	14.50	9.16
50th-Percentile Queue Length [ft/ln]		76.97	313.44	332.74	585.20	362.60	228.88
95th-Percentile Queue Length [veh/ln]		5.54	18.34	19.29	31.34	20.75	14.12
95th-Percentile Queue Length [ft/ln]		138.54	458.61	482.32	783.57	518.75	352.93

**Movement, Approach, & Intersection Results**

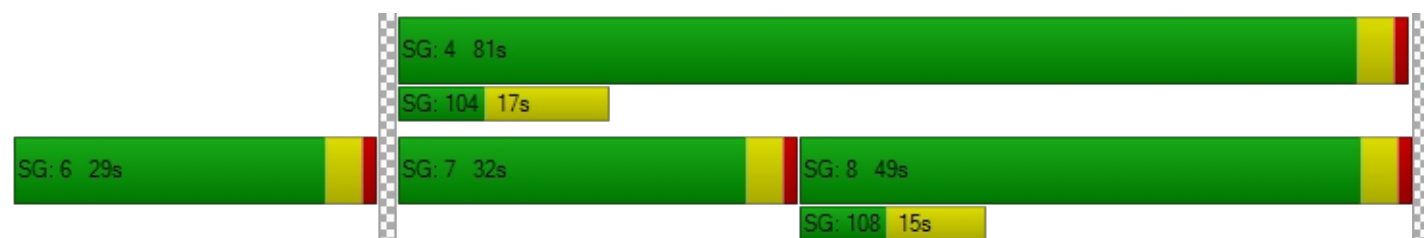
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	35.99	35.99	63.34	0.00	30.81	58.30	65.12	9.61	0.00
Movement LOS				D	D	E		C	E	E	A	
d_A, Approach Delay [s/veh]	0.00			56.21			41.31			21.37		
Approach LOS	A			E			D			C		
d_I, Intersection Delay [s/veh]	33.86											
Intersection LOS	C											
Intersection V/C	0.955											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.585	1.977	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	455	818	1400
d_b, Bicycle Delay [s]	55.00	32.84	19.20	4.95
I_b,int, Bicycle LOS Score for Intersection	4.132	2.414	2.589	3.246
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	44.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.937

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	193	0	109	0	0	0	106	224	0	0	299	39
Total Analysis Volume [veh/h]	773	0	436	0	0	0	424	895	0	0	1196	156
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	30	0	0	0	0	0	31	80	0	0	49	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	26	26		28	76	44	44
g / C, Green / Cycle	0.24	0.24	0.24		0.26	0.69	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.22	0.22	0.22		0.24	0.24	0.36	0.38
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	426	426	426		462	2625	756	716
d1, Uniform Delay [s]	41.30	41.30	41.30		39.74	6.88	30.96	31.94
k, delay calibration	0.32	0.32	0.32		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.00	24.00	24.00		7.77	0.35	15.28	22.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.95	0.95	0.95		0.92	0.34	0.89	0.94
d, Delay for Lane Group [s/veh]	65.30	65.30	65.30		47.51	7.23	46.23	54.39
Lane Group LOS	E	E	E		D	A	D	D
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	13.45	13.45	13.45		11.99	3.97	19.49	21.26
50th-Percentile Queue Length [ft/ln]	336.34	336.34	336.34		299.79	99.24	487.21	531.56
95th-Percentile Queue Length [veh/ln]	19.47	19.47	19.47		17.67	7.15	26.73	28.82
95th-Percentile Queue Length [ft/ln]	486.72	486.72	486.72		441.77	178.63	668.20	720.61

**Movement, Approach, & Intersection Results**

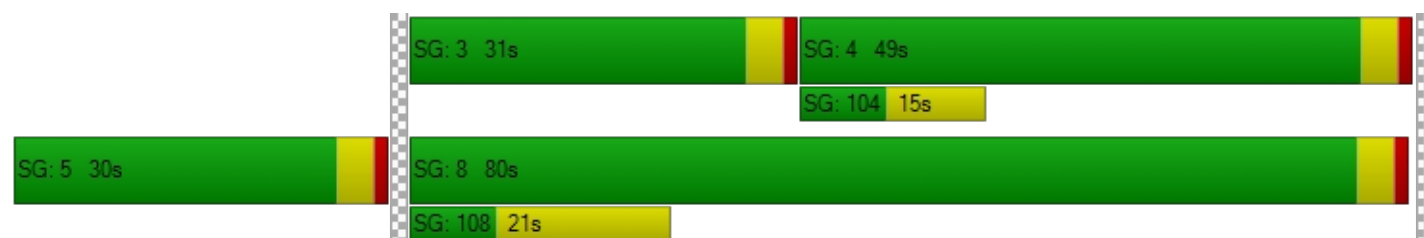
d_M, Delay for Movement [s/veh]	65.30	0.00	65.30	0.00	0.00	0.00	47.51	7.23	0.00	0.00	49.78	54.39
Movement LOS	E		E				D	A			D	D
d_A, Approach Delay [s/veh]	65.30			0.00			20.18			50.31		
Approach LOS	E			A			C			D		
d_I, Intersection Delay [s/veh]	44.74											
Intersection LOS	D											
Intersection V/C	0.937											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.343	1.998	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1382	818
d_b, Bicycle Delay [s]	55.00	55.00	5.25	19.20
I_b,int, Bicycle LOS Score for Intersection	6.127	4.132	2.648	2.675
Bicycle LOS	F	D	B	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.962

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	554	0	0	436	239	0	0	0	59	112	126
Total Analysis Volume [veh/h]	123	2216	0	0	1743	956	0	0	0	237	449	505
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	67	0	0	57	0	0	0	0	0	33	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	63	53	53		29	29	29
g / C, Green / Cycle	0.06	0.63	0.53	0.53		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.04	0.39	0.46	0.53		0.13	0.12	0.28
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3591	2018	956		522	1102	522
d1, Uniform Delay [s]	45.89	11.20	20.32	23.45		29.03	28.58	35.04
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.74	0.80	5.21	29.15		0.62	0.24	28.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.62	0.86	1.00		0.45	0.41	0.97
d, Delay for Lane Group [s/veh]	48.63	12.00	25.53	52.60		29.65	28.83	63.26
Lane Group LOS	D	B	C	F		C	C	E
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.56	9.20	17.77	28.39		4.69	4.32	15.91
50th-Percentile Queue Length [ft/ln]	39.04	230.08	444.27	709.68		117.14	108.10	397.81
95th-Percentile Queue Length [veh/ln]	2.81	14.18	24.68	37.13		8.24	7.73	22.45
95th-Percentile Queue Length [ft/ln]	70.28	354.46	617.10	928.26		205.88	193.35	561.37

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.63	12.00	0.00	0.00	25.53	52.60	0.00	0.00	0.00	29.65	28.83	63.26
Movement LOS	D	B			C	F				C	C	E
d_A, Approach Delay [s/veh]	13.93			35.12			0.00			43.59		
Approach LOS	B			D			A			D		
d_I, Intersection Delay [s/veh]	28.78											
Intersection LOS	C											
Intersection V/C	0.962											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.465	2.426
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1260	1060	0	580
d_b, Bicycle Delay [s]	6.85	11.05	50.00	25.21
I_b,int, Bicycle LOS Score for Intersection	2.846	3.044	4.132	2.542
Bicycle LOS	C	C	D	B

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	54.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.082

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	306	0	0	349	105	0	0	0	36	176	250
Total Analysis Volume [veh/h]	111	1224	0	0	1397	419	0	0	0	144	702	998
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	45	0	0	35	0	0	0	0	0	55	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	41	31	31		51	51	51
g / C, Green / Cycle	0.06	0.41	0.31	0.31		0.51	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.32	0.34		0.24	0.22	0.55
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2348	1182	560		914	965	914
d1, Uniform Delay [s]	46.96	22.02	34.45	34.45		15.91	15.49	24.60
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	42.99	0.83	32.49	61.80		0.38	0.30	57.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.01	0.52	1.02	1.08		0.47	0.43	1.09
d, Delay for Lane Group [s/veh]	89.94	22.85	66.94	96.25		16.29	15.79	82.45
Lane Group LOS	F	C	F	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.02	7.18	19.29	22.83		6.19	5.80	34.68
50th-Percentile Queue Length [ft/ln]	100.53	179.58	482.27	570.86		154.68	144.89	867.06
95th-Percentile Queue Length [veh/ln]	7.24	11.58	26.91	32.24		10.27	9.74	47.47
95th-Percentile Queue Length [ft/ln]	180.95	289.47	672.82	806.04		256.67	243.59	1186.84

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	89.94	22.85	0.00	0.00	70.85	96.25	0.00	0.00	0.00	16.29	16.00	82.45
Movement LOS	F	C			E	F				B	B	F
d_A, Approach Delay [s/veh]	28.43			76.71			0.00			51.98		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	54.68											
Intersection LOS	D											
Intersection V/C	1.082											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.320			2.544		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	820			620			0			1020		
d_b, Bicycle Delay [s]	17.41			23.81			50.00			12.01		
I_b,int, Bicycle LOS Score for Intersection	2.294			2.558			4.132			3.081		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.844

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	327	75	163	341	0	286	91	49	0	0	0
Total Analysis Volume [veh/h]	0	1308	299	652	1362	0	1143	364	197	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	31	31	21	56	36	36	36	
g / C, Green / Cycle	0.31	0.31	0.21	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.23	0.17	0.19	0.24	0.33	0.19	0.11	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	1760	556	729	3175	1270	690	653	
d1, Uniform Delay [s]	31.01	28.65	38.52	12.89	30.13	25.10	22.78	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.89	3.71	4.16	0.43	2.60	0.63	0.26	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.74	0.54	0.89	0.43	0.90	0.53	0.30	
d, Delay for Lane Group [s/veh]	33.90	32.36	42.68	13.32	32.73	25.73	23.04	
Lane Group LOS	C	C	D	B	C	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	9.70	6.42	8.08	5.75	13.03	6.79	3.32	
50th-Percentile Queue Length [ft/ln]	242.57	160.55	201.94	143.63	325.69	169.74	83.08	
95th-Percentile Queue Length [veh/ln]	14.81	10.58	12.74	9.68	18.95	11.06	5.98	
95th-Percentile Queue Length [ft/ln]	370.28	264.46	318.47	241.90	473.68	276.57	149.54	

**Movement, Approach, & Intersection Results**

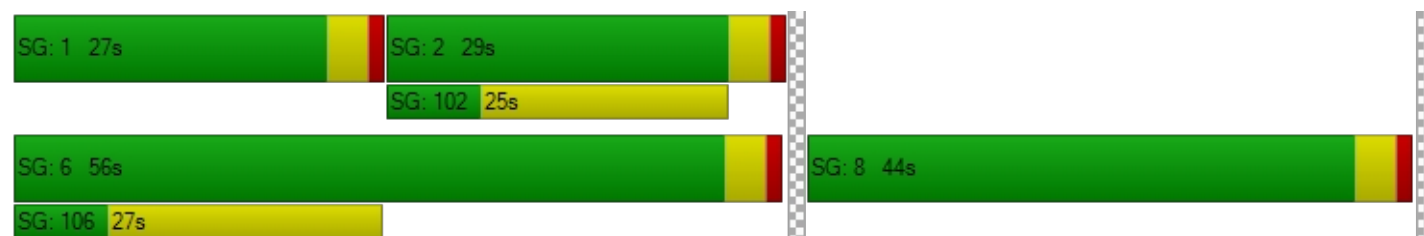
d_M, Delay for Movement [s/veh]	0.00	33.90	32.36	42.68	13.32	0.00	32.73	25.73	23.04	0.00	0.00	0.00
Movement LOS		C	C	D	B		C	C	C			
d_A, Approach Delay [s/veh]	33.61			22.82			30.11			0.00		
Approach LOS	C			C			C			A		
d_I, Intersection Delay [s/veh]	28.41											
Intersection LOS	C											
Intersection V/C	0.844											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.551			2.361		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.443			2.667			4.371			4.132		
Bicycle LOS	B			B			E			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	211	47	191	218	0	87	234	17	0	0	0
Total Analysis Volume [veh/h]	0	845	186	763	870	0	347	934	68	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	25	0	28	53	0	0	47	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	26	26	24	53	39	39	39	
g / C, Green / Cycle	0.26	0.26	0.24	0.53	0.39	0.39	0.39	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.19	0.22	0.23	0.36	0.33	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	977	463	824	2024	697	736	697	
d1, Uniform Delay [s]	33.68	34.10	37.37	14.16	29.28	28.19	19.51	
k, delay calibration	0.50	0.50	0.11	0.50	0.34	0.30	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	4.23	10.29	5.09	0.67	15.27	8.11	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.70	0.74	0.93	0.43	0.93	0.86	0.10	
d, Delay for Lane Group [s/veh]	37.91	44.39	42.46	14.83	44.55	36.30	19.57	
Lane Group LOS	D	D	D	B	D	D	B	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.02	8.86	9.54	5.88	17.21	15.13	1.01	
50th-Percentile Queue Length [ft/ln]	200.52	221.56	238.42	147.10	430.16	378.36	25.27	
95th-Percentile Queue Length [veh/ln]	12.67	13.74	14.60	9.86	24.01	21.51	1.82	
95th-Percentile Queue Length [ft/ln]	316.64	343.61	365.04	246.55	600.23	537.87	45.48	

**Movement, Approach, & Intersection Results**

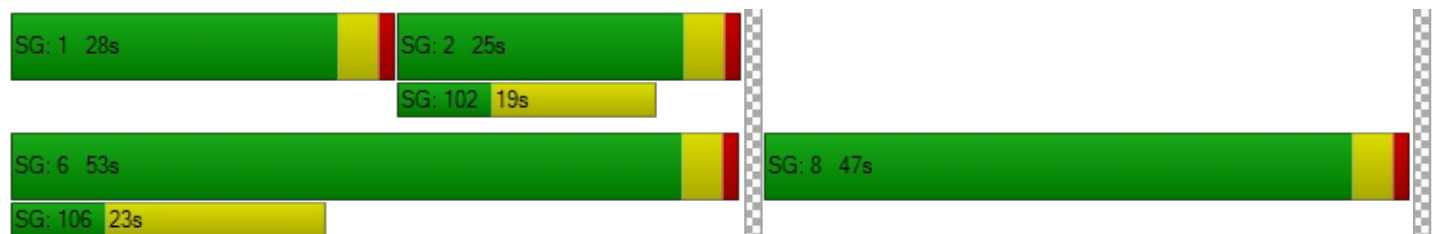
d_M, Delay for Movement [s/veh]	0.00	39.12	44.39	42.46	14.83	0.00	44.55	38.94	19.57	0.00	0.00	0.00
Movement LOS		D	D	D	B		D	D	B			
d_A, Approach Delay [s/veh]	40.07			27.74			39.41			0.00		
Approach LOS	D			C			D			A		
d_I, Intersection Delay [s/veh]	34.83											
Intersection LOS	C											
Intersection V/C	0.873											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.383			2.638		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	420			980			860			0		
d_b, Bicycle Delay [s]	31.21			13.01			16.25			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.127			2.907			2.673			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX J-VI*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR TRAFFIC CONDITIONS**

**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.000

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	28	9	69	0	344	227	105	306	0
Total Analysis Volume [veh/h]	0	0	0	111	34	277	0	1374	907	420	1222	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	21	0	0	59	0	30	89	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		17	17	55	55	26	85
g / C, Green / Cycle		0.15	0.15	0.50	0.50	0.24	0.77
(v / s)_i Volume / Saturation Flow Rate		0.08	0.15	0.36	0.50	0.23	0.32
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		278	278	1904	902	423	2936
d1, Uniform Delay [s]		42.74	46.45	21.44	27.44	41.97	4.19
k, delay calibration		0.11	0.13	0.50	0.50	0.34	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.51	26.40	2.40	31.33	34.51	0.44
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.52	0.99	0.72	1.01	0.99	0.42
d, Delay for Lane Group [s/veh]		44.25	72.84	23.84	58.77	76.48	4.63
Lane Group LOS		D	E	C	F	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		3.74	9.55	13.95	30.22	15.27	3.84
50th-Percentile Queue Length [ft/ln]		93.38	238.84	348.79	755.54	381.77	95.91
95th-Percentile Queue Length [veh/ln]		6.72	14.62	20.08	39.42	21.68	6.91
95th-Percentile Queue Length [ft/ln]		168.09	365.56	501.94	985.43	541.99	172.63

**Movement, Approach, & Intersection Results**

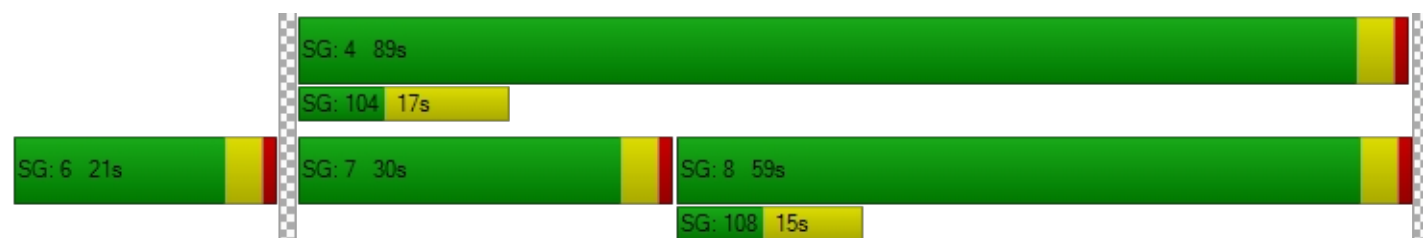
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	44.25	44.25	72.84	0.00	23.84	58.77	76.48	4.63	0.00
Movement LOS				D	D	E		C	F	E	A	
d_A, Approach Delay [s/veh]	0.00			63.02			37.73			23.01		
Approach LOS	A			E			D			C		
d_I, Intersection Delay [s/veh]	34.62											
Intersection LOS	C											
Intersection V/C	1.000											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.760			1.930			0.000			0.000		
Crosswalk LOS	C			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			309			1000			1545		
d_b, Bicycle Delay [s]	55.00			39.31			13.75			2.84		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.256			2.814			2.914		
Bicycle LOS	D			B			C			C		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	47.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.957

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	161	0	118	0	0	0	143	241	0	0	256	41
Total Analysis Volume [veh/h]	643	0	470	0	0	0	570	965	0	0	1025	163
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	27	0	0	0	0	0	40	83	0	0	43	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23		37	79	38	38
g / C, Green / Cycle	0.21	0.21	0.21		0.34	0.72	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.32	0.25	0.31	0.33
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	377	377	377		609	2728	652	618
d1, Uniform Delay [s]	43.29	43.29	43.29		35.22	5.87	34.52	35.41
k, delay calibration	0.27	0.27	0.27		0.14	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	30.55	30.55	30.55		8.96	0.36	19.14	27.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	0.98	0.98		0.94	0.35	0.91	0.96
d, Delay for Lane Group [s/veh]	73.84	73.84	73.84		44.18	6.23	53.66	63.34
Lane Group LOS	E	E	E		D	A	D	E
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	13.14	13.14	13.14		15.97	3.84	18.31	20.03
50th-Percentile Queue Length [ft/ln]	328.50	328.50	328.50		399.21	96.07	457.86	500.64
95th-Percentile Queue Length [veh/ln]	19.08	19.08	19.08		22.52	6.92	25.33	27.36
95th-Percentile Queue Length [ft/ln]	477.12	477.12	477.12		563.05	172.93	633.33	684.11

**Movement, Approach, & Intersection Results**

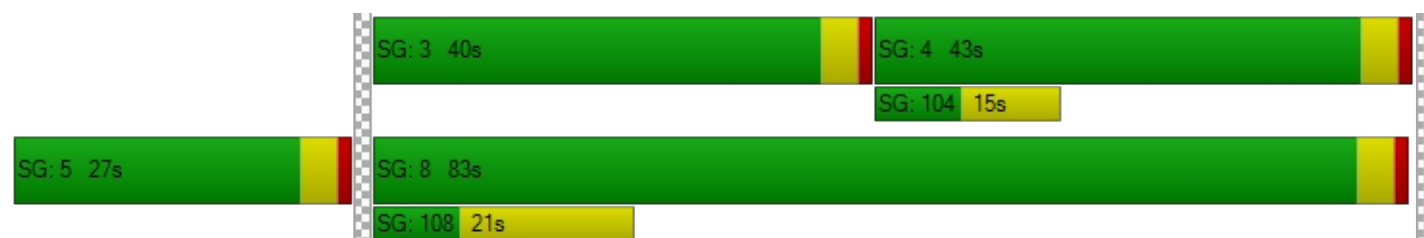
d_M, Delay for Movement [s/veh]	73.84	0.00	73.84	0.00	0.00	0.00	44.18	6.23	0.00	0.00	57.73	63.34
Movement LOS	E		E				D	A			E	E
d_A, Approach Delay [s/veh]	73.84			0.00			20.32			58.50		
Approach LOS	E			A			C			E		
d_I, Intersection Delay [s/veh]	47.67											
Intersection LOS	D											
Intersection V/C	0.957											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.311	2.148	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1436	709
d_b, Bicycle Delay [s]	55.00	55.00	4.37	22.91
I_b,int, Bicycle LOS Score for Intersection	5.969	4.132	2.826	2.540
Bicycle LOS	F	D	C	B

**Sequence**




Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	41.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.053

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	525	0	0	460	247	0	0	0	60	142	155
Total Analysis Volume [veh/h]	121	2100	0	0	1841	986	0	0	0	238	569	620
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	64	0	0	54	0	0	0	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	60	50	50		32	32	32
g / C, Green / Cycle	0.06	0.60	0.50	0.50		0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.48	0.55		0.13	0.15	0.34
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	206	3421	1905	902		576	1216	576
d1, Uniform Delay [s]	45.88	12.66	24.13	24.94		26.65	27.20	34.01
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.65	0.83	14.10	58.53		0.47	0.28	59.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.61	0.97	1.09		0.41	0.47	1.08
d, Delay for Lane Group [s/veh]	48.53	13.49	38.22	83.47		27.13	27.48	93.85
Lane Group LOS	D	B	D	F		C	C	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.53	9.38	23.30	34.49		4.47	5.40	23.12
50th-Percentile Queue Length [ft/ln]	38.36	234.52	582.43	862.37		111.65	135.09	578.10
95th-Percentile Queue Length [veh/ln]	2.76	14.40	31.21	47.27		7.93	9.22	32.54
95th-Percentile Queue Length [ft/ln]	69.04	360.09	780.32	1181.79		198.30	230.39	813.41

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	48.53	13.49	0.00	0.00	38.22	83.47	0.00	0.00	0.00	27.13	27.48	93.85
Movement LOS	D	B			D	F				C	C	F
d_A, Approach Delay [s/veh]	15.40			54.01			0.00			56.26		
Approach LOS	B			D			A			E		
d_I, Intersection Delay [s/veh]	41.26											
Intersection LOS	D											
Intersection V/C	1.053											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.537			2.484		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1200			1000			0			640		
d_b, Bicycle Delay [s]	8.00			12.50			50.00			23.12		
I_b,int, Bicycle LOS Score for Intersection	2.781			3.114			4.132			2.737		
Bicycle LOS	C			C			D			B		

**Sequence**



Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	44.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.005

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	228	0	0	352	121	0	0	0	46	173	218
Total Analysis Volume [veh/h]	91	912	0	0	1407	485	0	0	0	185	692	871
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	48	0	0	38	0	0	0	0	0	52	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	44	34	34		48	48	48
g / C, Green / Cycle	0.06	0.44	0.34	0.34		0.48	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.05	0.16	0.33	0.35		0.25	0.23	0.48
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	110	2517	1295	613		861	909	861
d1, Uniform Delay [s]	46.44	18.56	32.54	32.97		18.08	17.60	26.08
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	14.53	0.41	19.57	43.80		0.48	0.39	32.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.83	0.36	0.97	1.03		0.52	0.47	1.01
d, Delay for Lane Group [s/veh]	60.98	18.97	52.11	76.77		18.57	17.99	58.84
Lane Group LOS	E	B	D	F		B	B	F
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.67	4.67	18.10	21.82		6.98	6.56	26.96
50th-Percentile Queue Length [ft/ln]	66.69	116.81	452.38	545.56		174.41	164.02	673.93
95th-Percentile Queue Length [veh/ln]	4.80	8.22	25.07	30.05		11.31	10.76	35.80
95th-Percentile Queue Length [ft/ln]	120.05	205.44	626.78	751.35		282.71	269.04	894.92

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	60.98	18.97	0.00	0.00	54.66	76.77	0.00	0.00	0.00	18.57	18.20	58.84
Movement LOS	E	B			D	E				B	B	F
d_A, Approach Delay [s/veh]	22.78			60.33			0.00			38.49		
Approach LOS	C			E			A			D		
d_I, Intersection Delay [s/veh]	43.99											
Intersection LOS	D											
Intersection V/C	1.005											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.338			2.513		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	880			680			0			960		
d_b, Bicycle Delay [s]	15.68			21.78			50.00			13.52		
I_b,int, Bicycle LOS Score for Intersection	2.111			2.600			4.132			3.002		
Bicycle LOS	B			B			D			C		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	319	71	161	352	0	231	74	40	0	0	0
Total Analysis Volume [veh/h]	0	1274	284	643	1409	0	925	294	160	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	31	60	0	0	40	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	37	37	21	62	30	30	30	
g / C, Green / Cycle	0.37	0.37	0.21	0.62	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.18	0.25	0.26	0.15	0.09	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2094	661	737	3523	1057	574	544	
d1, Uniform Delay [s]	25.77	23.76	38.17	9.69	33.12	28.83	26.74	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.32	2.03	3.40	0.34	2.47	0.71	0.30	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.61	0.43	0.87	0.40	0.88	0.51	0.29	
d, Delay for Lane Group [s/veh]	27.09	25.79	41.57	10.03	35.59	29.54	27.04	
Lane Group LOS	C	C	D	B	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	8.29	5.33	7.85	4.93	10.74	5.85	2.94	
50th-Percentile Queue Length [ft/ln]	207.22	133.14	196.23	123.27	268.51	146.37	73.60	
95th-Percentile Queue Length [veh/ln]	13.01	9.11	12.44	8.57	16.11	9.82	5.30	
95th-Percentile Queue Length [ft/ln]	325.25	227.75	311.10	214.31	402.87	245.58	132.48	

**Movement, Approach, & Intersection Results**

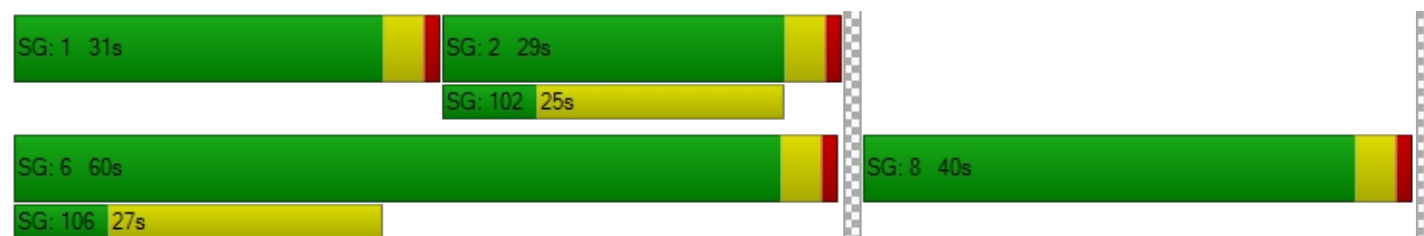
d_M, Delay for Movement [s/veh]	0.00	27.09	25.79	41.57	10.03	0.00	35.59	29.54	27.04	0.00	0.00	0.00
Movement LOS		C	C	D	B		D	C	C			
d_A, Approach Delay [s/veh]	26.86			19.91			33.31			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	25.78											
Intersection LOS	C											
Intersection V/C	0.763											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.472			2.315		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1120			720			0		
d_b, Bicycle Delay [s]	28.13			9.68			20.48			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.417			2.688			3.835			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	184	49	195	219	0	65	231	16	0	0	0
Total Analysis Volume [veh/h]	0	737	194	780	874	0	261	922	63	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	31	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	27	27	25	56	36	36	36	
g / C, Green / Cycle	0.27	0.27	0.25	0.56	0.36	0.36	0.36	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.17	0.22	0.23	0.33	0.31	0.04	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1035	490	861	2121	651	687	651	
d1, Uniform Delay [s]	31.65	32.00	36.59	12.68	30.49	29.44	21.10	
k, delay calibration	0.50	0.50	0.11	0.50	0.31	0.27	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	2.57	6.12	3.99	0.59	13.78	7.20	0.06	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.60	0.63	0.91	0.41	0.92	0.85	0.10	
d, Delay for Lane Group [s/veh]	34.22	38.12	40.57	13.27	44.27	36.63	21.17	
Lane Group LOS	C	D	D	B	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	6.80	7.33	9.54	5.50	15.77	13.94	0.98	
50th-Percentile Queue Length [ft/ln]	169.94	183.28	238.54	137.58	394.25	348.41	24.52	
95th-Percentile Queue Length [veh/ln]	11.07	11.77	14.61	9.35	22.28	20.06	1.77	
95th-Percentile Queue Length [ft/ln]	276.84	294.29	365.19	233.76	557.07	501.47	44.13	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	34.84	38.12	40.57	13.27	0.00	44.27	39.42	21.17	0.00	0.00	0.00
Movement LOS		C	D	D	B		D	D	C			
d_A, Approach Delay [s/veh]	35.52			26.15			39.51			0.00		
Approach LOS	D			C			D			A		
d_I, Intersection Delay [s/veh]	32.77											
Intersection LOS	C											
Intersection V/C	0.826											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.350			2.644		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			1000			840			0		
d_b, Bicycle Delay [s]	32.81			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.072			2.924			2.588			4.132		
Bicycle LOS	B			C			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



*APPENDIX J-VII*




**YEAR 2030 BUILDOUT PLUS PROJECT WITH IMPROVEMENTS  
WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS**



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.900

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	212	0	136	0	0	0	106	334	0	0	384	57
Total Analysis Volume [veh/h]	846	0	543	0	0	0	424	1334	0	0	1535	226
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	47	0	0	0	0	0	44	63	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	32	32		28	69	37	37
g / C, Green / Cycle	0.30	0.30	0.30		0.26	0.63	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.26	0.26	0.26		0.24	0.35	0.31	0.31
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	3800	1900
c, Capacity [veh/h]	532	532	532		462	2401	1287	644
d1, Uniform Delay [s]	36.75	36.75	36.75		39.73	11.48	34.79	34.79
k, delay calibration	0.21	0.21	0.21		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.34	8.34	8.34		7.74	0.93	11.28	19.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.87	0.87	0.87		0.92	0.56	0.91	0.91
d, Delay for Lane Group [s/veh]	45.09	45.09	45.09		47.47	12.41	46.07	54.23
Lane Group LOS	D	D	D		D	B	D	D
Critical Lane Group	Yes	No	No		Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	12.85	12.85	12.85		11.99	8.91	16.73	18.19
50th-Percentile Queue Length [ft/ln]	321.26	321.26	321.26		299.67	222.72	418.28	454.76
95th-Percentile Queue Length [veh/ln]	18.73	18.73	18.73		17.66	13.80	23.44	25.18
95th-Percentile Queue Length [ft/ln]	468.24	468.24	468.24		441.62	345.09	585.98	629.62

**Movement, Approach, & Intersection Results**

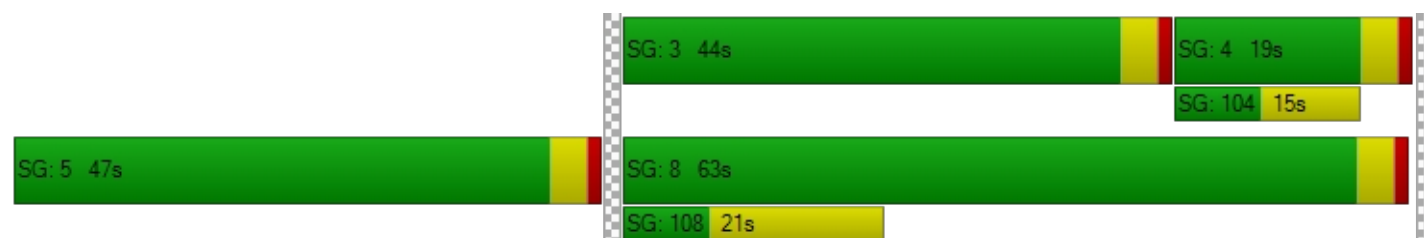
d_M, Delay for Movement [s/veh]	45.09	0.00	45.09	0.00	0.00	0.00	47.47	12.41	0.00	0.00	47.99	54.23
Movement LOS	D		D				D	B			D	D
d_A, Approach Delay [s/veh]	45.09			0.00			20.87			48.79		
Approach LOS	D			A			C			D		
d_I, Intersection Delay [s/veh]	37.74											
Intersection LOS	D											
Intersection V/C	0.900											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.401	2.067	0.000	0.000
Crosswalk LOS	B	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1073	273
d_b, Bicycle Delay [s]	55.00	55.00	11.82	41.02
I_b,int, Bicycle LOS Score for Intersection	6.424	4.132	3.010	2.528
Bicycle LOS	F	D	C	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## APPENDIX K

### BASIC FREEWAY SEGMENT ANALYSIS

*APPENDIX K-1*

**EXISTING WEEKDAY PM PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8871	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1588
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7657	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1371
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.58
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6468	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1389
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7193	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1932
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.82
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	31.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, east of Lemon Street	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8009	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1721
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.73
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	27.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7599	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2040
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.2
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	34.5
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7063	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1896
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Weekday PM Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6936	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1490
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

*APPENDIX K-II*

**EXISTING SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7865	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1408
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7327	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1312
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.56
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	20.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6931	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1489
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7626	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2048
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	34.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7724	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1659
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	25.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7478	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2008
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.85
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	33.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6994	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1878
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.80
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7292	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1566
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

*APPENDIX K-III*

**EXISTING SATURDAY DEPARTURE PEAK HOUR**



# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8086	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1448
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7555	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1352
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.58
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	20.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6862	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1474
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7518	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2019
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.86
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	33.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7525	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1617
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.69
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.3
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	25.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7261	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1950
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	60.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	32.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6891	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1850
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	29.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7263	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1560
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-IV*

**EXISTING PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8049	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1441
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7360	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1318
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.56
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	20.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7054	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1515
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7676	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2061
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	35.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7528	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2022
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.86
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	34.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7179	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1928
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.82
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	31.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7305	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1569
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-V*

**EXISTING PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8107	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1451
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7708	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1380
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6876	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1477
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7747	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2080
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	35.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7491	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2012
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.86
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	33.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	6912	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1856
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	29.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7324	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1573
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-VI*

**YEAR 2020 CUMULATIVE  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8023	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1436
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7481	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1339
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	20.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7079	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1521
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.5
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7778	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2088
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.3
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	35.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7626	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2048
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	34.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7141	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1918
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.82
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.2
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	31.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7438	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1598
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.4
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-VII*

**YEAR 2020 CUMULATIVE  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8248	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1476
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7713	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1381
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7010	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1506
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7668	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2059
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	35.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7405	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1988
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.85
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	60.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	33.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7036	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1889
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.80
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7409	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1592
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-VIII*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8207	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1469
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7514	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1345
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	20.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7202	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1547
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7828	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2102
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.89
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	36.2
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7676	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2061
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	58.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	35.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7326	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1967
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.84
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	60.4
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	32.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7451	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1601
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.4
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-IX*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8269	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1480
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	22.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7866	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1408
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	21.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7024	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1509
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.8
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	23.3
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7897	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2120
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.90
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	57.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	36.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7635	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	2050
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	59.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	34.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7057	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1895
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	7470	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	0.95	Flow Rate (Vp), pc/h/ln	1605
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.4
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-X*

**YEAR 2030 BUILDOUT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9832	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1672
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	26.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9324	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1586
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8645	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1764
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.75
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	28.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9533	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2432
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.03
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9385	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2394
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.02
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8778	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2239
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.95
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	55.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	40.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9115	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1860
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-XI*

**YEAR 2030 BUILDOUT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	10108	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1719
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.73
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	27.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9608	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1634
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.70
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	25.5
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8553	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1746
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.3
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	27.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9398	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2398
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.02
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9114	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2325
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.99
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	52.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	44.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8659	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2209
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	55.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	39.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9078	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1853
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	29.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-XII*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	10016	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1703
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.72
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.7
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	26.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9357	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1591
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.68
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	24.7
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8768	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1789
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.76
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	28.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9583	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2445
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.04
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9435	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2407
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.02
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8963	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2286
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.97
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	53.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	42.4
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9128	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1863
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	62.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.0
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



*APPENDIX K-XIII*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	10129	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1723
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.73
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.5
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	27.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	6	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9761	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1660
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.71
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	64.0
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	25.9
Total Ramp Density Adjustment	-	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB, north of Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8567	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1748
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	63.3
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	27.6
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB, south of Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9627	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2456
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.05
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 WB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9344	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2384
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.01
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	-	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB, west of Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, In	4	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	8680	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	2214
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	55.6
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	39.8
Total Ramp Density Adjustment	-	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		

# HCS7 Basic Freeway Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB, east of Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

Number of Lanes, ln	5	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Measured	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	-
Lane Width, ft	-	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	-		

## Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

## Demand and Capacity

Demand Volume veh/h	9139	Heavy Vehicle Adjustment Factor (fHV)	0.980
Peak Hour Factor	1.00	Flow Rate (Vp), pc/h/ln	1865
Total Trucks, %	2.00	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (cadj), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (ET)	2.000		

## Speed and Density

Lane Width Adjustment (fLW)	-	Average Speed (S), mi/h	61.9
Right-Side Lateral Clearance Adj. (fRLC)	-	Density (D), pc/mi/ln	30.1
Total Ramp Density Adjustment	-	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFSadj), mi/h	65.0		



## APPENDIX L

### MERGE/DIVERGE ANALYSIS

*APPENDIX L-1*

**EXISTING SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7865	789
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8448	847
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.60	0.42

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	18.6
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.504
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1548
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.2
Flow in Lanes 1 and 2 (v12), pc/h	3240	Ramp Junction Speed (S), mi/h	60.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	23.4
Level of Service (LOS)	B	L-2	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6629	698
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7120	750
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.56	0.38

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.5
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.310
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1602
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.9
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.124	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2136	Ramp Junction Speed (S), mi/h	59.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	2886	Average Density (D), pc/mi/ln	22.0
Level of Service (LOS)	C	L-3	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6931	626
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7445	672
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.34

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.3
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.488
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1490
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.4
Flow in Lanes 1 and 2 (v12), pc/h	2976	Ramp Junction Speed (S), mi/h	60.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.6
Level of Service (LOS)	B	L-4	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6859	767
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7367	824
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.87	0.41

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	30.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.447
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2210
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.115	Outer Lanes Freeway Speed (SO), mi/h	58.8
Flow in Lanes 1 and 2 (v12), pc/h	2947	Ramp Junction Speed (S), mi/h	56.8
Flow Entering Ramp-Infl. Area (vR12), pc/h	3771	Average Density (D), pc/mi/ln	36.1
Level of Service (LOS)	D	L-5	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6385	1093
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6858	1174
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.85	0.59

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.466
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2058
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.071	Outer Lanes Freeway Speed (SO), mi/h	59.4
Flow in Lanes 1 and 2 (v12), pc/h	2743	Ramp Junction Speed (S), mi/h	56.8
Flow Entering Ramp-Infl. Area (vR12), pc/h	3917	Average Density (D), pc/mi/ln	35.4
Level of Service (LOS)	D	L-6	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6994	1082
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7512	1162
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.80	0.58

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	35.4
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.533
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1791
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influence Area Speed (SR), mi/h	52.7
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.2
Flow in Lanes 1 and 2 (v12), pc/h	3931	Ramp Junction Speed (S), mi/h	59.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	31.8
Level of Service (LOS)	E	L-7	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	5912	1380
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6350	1482
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.67	0.74

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.1
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.334
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1448
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.033	Outer Lanes Freeway Speed (SO), mi/h	61.6
Flow in Lanes 1 and 2 (v12), pc/h	1930	Ramp Junction Speed (S), mi/h	59.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	3412	Average Density (D), pc/mi/ln	26.5
Level of Service (LOS)	C	L-8	

*APPENDIX L-II*

**EXISTING SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8086	811
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8685	871
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.62	0.44

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	19.4
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.506
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1591
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.0
Flow in Lanes 1 and 2 (v12), pc/h	3331	Ramp Junction Speed (S), mi/h	60.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.1
Level of Service (LOS)	B	L-10	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6866	689
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7375	740
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.58	0.37

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.315
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1660
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.125	Outer Lanes Freeway Speed (SO), mi/h	60.8
Flow in Lanes 1 and 2 (v12), pc/h	2212	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	2952	Average Density (D), pc/mi/ln	22.8
Level of Service (LOS)	C	L-11	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6862	609
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7371	654
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.33

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.0
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.487
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1478
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.4
Flow in Lanes 1 and 2 (v12), pc/h	2940	Ramp Junction Speed (S), mi/h	60.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.3
Level of Service (LOS)	B	L-12	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6734	784
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7233	842
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.86	0.42

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	30.4
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.441
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2170
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.113	Outer Lanes Freeway Speed (SO), mi/h	59.0
Flow in Lanes 1 and 2 (v12), pc/h	2893	Ramp Junction Speed (S), mi/h	57.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3735	Average Density (D), pc/mi/ln	35.4
Level of Service (LOS)	D	L-13	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6226	1035
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6687	1112
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.83	0.56

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	30.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.442
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2006
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.079	Outer Lanes Freeway Speed (SO), mi/h	59.6
Flow in Lanes 1 and 2 (v12), pc/h	2675	Ramp Junction Speed (S), mi/h	57.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	3787	Average Density (D), pc/mi/ln	34.1
Level of Service (LOS)	D	L-14	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6891	970
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7402	1042
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.52

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	34.5
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.522
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1794
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.2
Flow in Lanes 1 and 2 (v12), pc/h	3815	Ramp Junction Speed (S), mi/h	59.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	31.2
Level of Service (LOS)	D	L-15	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing (Year 2018)
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	5921	1342
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6360	1441
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.66	0.72

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.8
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.330
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1450
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.4
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.038	Outer Lanes Freeway Speed (SO), mi/h	61.6
Flow in Lanes 1 and 2 (v12), pc/h	1933	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	3374	Average Density (D), pc/mi/ln	26.3
Level of Service (LOS)	C	L-16	

*APPENDIX L-III*

**EXISTING PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8049	973
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8646	1045
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.61	0.52

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.522
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1534
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influence Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.2
Flow in Lanes 1 and 2 (v12), pc/h	3417	Ramp Junction Speed (S), mi/h	59.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.2
Level of Service (LOS)	C	L-18	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6629	731
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7120	785
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.56	0.39

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.313
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1602
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.120	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2136	Ramp Junction Speed (S), mi/h	59.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	2921	Average Density (D), pc/mi/ln	22.2
Level of Service (LOS)	C	L-19	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7054	749
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7577	805
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.64	0.40

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	17.4
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.500
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1482
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.5
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.4
Flow in Lanes 1 and 2 (v12), pc/h	3097	Ramp Junction Speed (S), mi/h	60.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	25.1
Level of Service (LOS)	B	L-20	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6859	817
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7367	878
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.88	0.44

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.1
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.457
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2210
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.108	Outer Lanes Freeway Speed (SO), mi/h	58.8
Flow in Lanes 1 and 2 (v12), pc/h	2947	Ramp Junction Speed (S), mi/h	56.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	3825	Average Density (D), pc/mi/ln	36.4
Level of Service (LOS)	D	L-21	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6385	1143
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6858	1228
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.86	0.61

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.4
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.477
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2058
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.0
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.064	Outer Lanes Freeway Speed (SO), mi/h	59.4
Flow in Lanes 1 and 2 (v12), pc/h	2743	Ramp Junction Speed (S), mi/h	56.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	3971	Average Density (D), pc/mi/ln	35.7
Level of Service (LOS)	D	L-22	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7179	1267
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7711	1361
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.82	0.68

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.2
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.550
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1791
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.2
Flow in Lanes 1 and 2 (v12), pc/h	4130	Ramp Junction Speed (S), mi/h	58.7
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	32.8
Level of Service (LOS)	E	L-23	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	5912	1393
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6350	1496
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.67	0.75

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.2
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.336
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1448
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.031	Outer Lanes Freeway Speed (SO), mi/h	61.6
Flow in Lanes 1 and 2 (v12), pc/h	1930	Ramp Junction Speed (S), mi/h	59.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	3426	Average Density (D), pc/mi/ln	26.5
Level of Service (LOS)	C		

*APPENDIX L-IV*

**EXISTING PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8107	832
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8708	894
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.62	0.45

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	19.6
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.508
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1590
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influence Area Speed (SR), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.0
Flow in Lanes 1 and 2 (v12), pc/h	3352	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.2
Level of Service (LOS)	B	L-26	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6866	842
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7375	904
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.59	0.45

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.2
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.328
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1660
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.105	Outer Lanes Freeway Speed (SO), mi/h	60.8
Flow in Lanes 1 and 2 (v12), pc/h	2212	Ramp Junction Speed (S), mi/h	59.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	3116	Average Density (D), pc/mi/ln	23.3
Level of Service (LOS)	C	L-27	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6876	623
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7386	669
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.33

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.2
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.488
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1477
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.4
Flow in Lanes 1 and 2 (v12), pc/h	2954	Ramp Junction Speed (S), mi/h	60.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.4
Level of Service (LOS)	B	L-28	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6734	1013
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7233	1088
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.89	0.54

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	32.2
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.487
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2170
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.082	Outer Lanes Freeway Speed (SO), mi/h	59.0
Flow in Lanes 1 and 2 (v12), pc/h	2893	Ramp Junction Speed (S), mi/h	56.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	3981	Average Density (D), pc/mi/ln	36.9
Level of Service (LOS)	D	L-29	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6226	1265
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6687	1359
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.86	0.68

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.8
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.491
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2006
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.048	Outer Lanes Freeway Speed (SO), mi/h	59.6
Flow in Lanes 1 and 2 (v12), pc/h	2675	Ramp Junction Speed (S), mi/h	56.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	4034	Average Density (D), pc/mi/ln	35.6
Level of Service (LOS)	D	L-30	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6912	991
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7424	1064
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.53

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	34.6
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.524
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1794
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.2
Flow in Lanes 1 and 2 (v12), pc/h	3837	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	31.3
Level of Service (LOS)	D		



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Existing + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	5921	1403
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6360	1507
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.67	0.75

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.3
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.338
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1450
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.2
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.029	Outer Lanes Freeway Speed (SO), mi/h	61.6
Flow in Lanes 1 and 2 (v12), pc/h	1933	Ramp Junction Speed (S), mi/h	59.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	3440	Average Density (D), pc/mi/ln	26.6
Level of Service (LOS)	C		

*APPENDIX L-V*

**YEAR 2020 CUMULATIVE  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8023	798
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8618	857
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.61	0.43

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	19.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.505
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1581
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.0
Flow in Lanes 1 and 2 (v12), pc/h	3301	Ramp Junction Speed (S), mi/h	60.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	23.9
Level of Service (LOS)	B	L-34	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6774	707
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7276	759
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.57	0.38

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.9
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.314
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1637
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.123	Outer Lanes Freeway Speed (SO), mi/h	60.9
Flow in Lanes 1 and 2 (v12), pc/h	2183	Ramp Junction Speed (S), mi/h	59.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	2942	Average Density (D), pc/mi/ln	22.5
Level of Service (LOS)	C	L-35	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7079	637
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7604	684
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.65	0.34

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.9
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.490
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1523
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.3
Flow in Lanes 1 and 2 (v12), pc/h	3038	Ramp Junction Speed (S), mi/h	60.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	25.1
Level of Service (LOS)	B	L-36	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7002	776
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7521	834
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.89	0.42

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.3
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.460
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2257
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.114	Outer Lanes Freeway Speed (SO), mi/h	58.7
Flow in Lanes 1 and 2 (v12), pc/h	3008	Ramp Junction Speed (S), mi/h	56.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	3842	Average Density (D), pc/mi/ln	36.9
Level of Service (LOS)	D	L-37	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6515	1111
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6998	1193
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.87	0.60

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.481
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2100
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.9
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.069	Outer Lanes Freeway Speed (SO), mi/h	59.2
Flow in Lanes 1 and 2 (v12), pc/h	2799	Ramp Junction Speed (S), mi/h	56.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	3992	Average Density (D), pc/mi/ln	36.2
Level of Service (LOS)	D	L-38	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7141	1102
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7670	1184
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.82	0.59

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	36.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.535
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1829
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.7
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.1
Flow in Lanes 1 and 2 (v12), pc/h	4012	Ramp Junction Speed (S), mi/h	59.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	32.4
Level of Service (LOS)	E	L-39	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6039	1399
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6487	1503
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.75

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.342
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1479
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.1
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.030	Outer Lanes Freeway Speed (SO), mi/h	61.5
Flow in Lanes 1 and 2 (v12), pc/h	1972	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3475	Average Density (D), pc/mi/ln	27.1
Level of Service (LOS)	C	L-40	

*APPENDIX L-VI*

**YEAR 2020 CUMULATIVE  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8248	820
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8859	881
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.44

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	19.9
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.507
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1625
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.9
Flow in Lanes 1 and 2 (v12), pc/h	3394	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.6
Level of Service (LOS)	B	L-42	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7015	698
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7535	750
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.59	0.38

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.4
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.319
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1696
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.124	Outer Lanes Freeway Speed (SO), mi/h	60.7
Flow in Lanes 1 and 2 (v12), pc/h	2260	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	3010	Average Density (D), pc/mi/ln	23.3
Level of Service (LOS)	C	L-43	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7010	620
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7530	666
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.64	0.33

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.6
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.488
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1511
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.3
Flow in Lanes 1 and 2 (v12), pc/h	3002	Ramp Junction Speed (S), mi/h	60.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.9
Level of Service (LOS)	B	L-44	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6876	792
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7386	851
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.88	0.43

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.453
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2216
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.111	Outer Lanes Freeway Speed (SO), mi/h	58.8
Flow in Lanes 1 and 2 (v12), pc/h	2954	Ramp Junction Speed (S), mi/h	56.8
Flow Entering Ramp-Infl. Area (vR12), pc/h	3805	Average Density (D), pc/mi/ln	36.3
Level of Service (LOS)	D	L-45	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6353	1052
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6824	1130
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.85	0.57

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	30.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.455
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2047
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.077	Outer Lanes Freeway Speed (SO), mi/h	59.4
Flow in Lanes 1 and 2 (v12), pc/h	2730	Ramp Junction Speed (S), mi/h	56.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	3860	Average Density (D), pc/mi/ln	34.9
Level of Service (LOS)	D	L-46	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7036	988
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7557	1061
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.80	0.53

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	35.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.523
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1832
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.1
Flow in Lanes 1 and 2 (v12), pc/h	3893	Ramp Junction Speed (S), mi/h	59.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	31.8
Level of Service (LOS)	E	L-47	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum.
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6048	1361
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6496	1462
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.73

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.3
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.337
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1481
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.2
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.035	Outer Lanes Freeway Speed (SO), mi/h	61.5
Flow in Lanes 1 and 2 (v12), pc/h	1975	Ramp Junction Speed (S), mi/h	59.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	3437	Average Density (D), pc/mi/ln	26.9
Level of Service (LOS)	C	L-48	

*APPENDIX L-VII*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8207	982
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8815	1055
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.53

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.7
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.523
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1567
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.1
Flow in Lanes 1 and 2 (v12), pc/h	3478	Ramp Junction Speed (S), mi/h	59.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C	L-50	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6774	740
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7276	795
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.57	0.40

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.2
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.317
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1637
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.118	Outer Lanes Freeway Speed (SO), mi/h	60.9
Flow in Lanes 1 and 2 (v12), pc/h	2183	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	2978	Average Density (D), pc/mi/ln	22.7
Level of Service (LOS)	C		

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7202	760
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7736	816
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.66	0.41

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	17.9
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.501
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1515
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.5
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.3
Flow in Lanes 1 and 2 (v12), pc/h	3159	Ramp Junction Speed (S), mi/h	60.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	25.7
Level of Service (LOS)	B	L-52	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7002	826
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7521	887
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.89	0.44

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	31.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.470
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2257
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	54.2
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.107	Outer Lanes Freeway Speed (SO), mi/h	58.7
Flow in Lanes 1 and 2 (v12), pc/h	3008	Ramp Junction Speed (S), mi/h	56.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	3895	Average Density (D), pc/mi/ln	37.2
Level of Service (LOS)	D	L-53	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6515	1161
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6998	1247
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.88	0.62

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	32.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.493
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2100
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.062	Outer Lanes Freeway Speed (SO), mi/h	59.2
Flow in Lanes 1 and 2 (v12), pc/h	2799	Ramp Junction Speed (S), mi/h	56.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	4046	Average Density (D), pc/mi/ln	36.5
Level of Service (LOS)	D	L-54	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7326	1287
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7869	1382
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.84	0.69

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.8
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.552
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1830
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.3
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.1
Flow in Lanes 1 and 2 (v12), pc/h	4210	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	33.6
Level of Service (LOS)	E	L-55	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6039	1412
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6487	1517
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.76

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.344
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1479
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.1
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.028	Outer Lanes Freeway Speed (SO), mi/h	61.5
Flow in Lanes 1 and 2 (v12), pc/h	1972	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3489	Average Density (D), pc/mi/ln	27.1
Level of Service (LOS)	C	L-56	

*APPENDIX L-VIII*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8269	841
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8882	903
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.45

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	20.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.509
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1624
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influence Area Speed (SR), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.9
Flow in Lanes 1 and 2 (v12), pc/h	3414	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C	L-58	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7015	851
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7535	914
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.60	0.46

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.333
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1696
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.104	Outer Lanes Freeway Speed (SO), mi/h	60.7
Flow in Lanes 1 and 2 (v12), pc/h	2260	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3174	Average Density (D), pc/mi/ln	23.9
Level of Service (LOS)	C		

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7024	634
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7545	681
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.64	0.34

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	16.7
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.489
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1510
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influence Area Speed (SR), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	69.3
Flow in Lanes 1 and 2 (v12), pc/h	3016	Ramp Junction Speed (S), mi/h	60.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	24.9
Level of Service (LOS)	B	L-60	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6876	1021
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7386	1097
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.90	0.55

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	32.8
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.502
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2216
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.081	Outer Lanes Freeway Speed (SO), mi/h	58.8
Flow in Lanes 1 and 2 (v12), pc/h	2954	Ramp Junction Speed (S), mi/h	56.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	4051	Average Density (D), pc/mi/ln	37.8
Level of Service (LOS)	D	L-61	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6353	1282
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6824	1377
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.87	0.69

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	32.4
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.507
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2047
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.046	Outer Lanes Freeway Speed (SO), mi/h	59.4
Flow in Lanes 1 and 2 (v12), pc/h	2730	Ramp Junction Speed (S), mi/h	56.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	4107	Average Density (D), pc/mi/ln	36.5
Level of Service (LOS)	D	L-62	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7057	1009
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7580	1084
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.81	0.54

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	35.3
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.526
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1832
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.1
Flow in Lanes 1 and 2 (v12), pc/h	3916	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	32.0
Level of Service (LOS)	E	L-63	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2020 Cum. + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	6048	1422
Peak Hour Factor (PHF)	0.95	0.95
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	6496	1527
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.76

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.8
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.345
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1481
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	57.1
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.027	Outer Lanes Freeway Speed (SO), mi/h	61.5
Flow in Lanes 1 and 2 (v12), pc/h	1975	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3502	Average Density (D), pc/mi/ln	27.2
Level of Service (LOS)	C	L-64	

*APPENDIX L-IX*

**YEAR 2030 BUILDOUT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	9832	984
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	10033	1004
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.71	0.50

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	23.8
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.518
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1839
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.1
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.0
Flow in Lanes 1 and 2 (v12), pc/h	3847	Ramp Junction Speed (S), mi/h	59.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	28.1
Level of Service (LOS)	C	L-66	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8289	1035
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8458	1056
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.67	0.53

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	25.8
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.382
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1903
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	56.2
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.086	Outer Lanes Freeway Speed (SO), mi/h	59.9
Flow in Lanes 1 and 2 (v12), pc/h	2537	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3593	Average Density (D), pc/mi/ln	27.3
Level of Service (LOS)	C	L-67	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8645	849
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8821	866
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.75	0.43

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.4
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.506
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1746
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.4
Flow in Lanes 1 and 2 (v12), pc/h	3565	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	29.5
Level of Service (LOS)	C	L-68	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8460	1073
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8633	1095
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.03	0.55

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	36.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2590
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	50.1
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.081	Outer Lanes Freeway Speed (SO), mi/h	56.7
Flow in Lanes 1 and 2 (v12), pc/h	3453	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4548	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-69	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7948	1437
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8110	1466
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.02	0.73

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.1
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2433
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	48.8
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.035	Outer Lanes Freeway Speed (SO), mi/h	57.7
Flow in Lanes 1 and 2 (v12), pc/h	3244	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4710	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-70	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8778	1393
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8957	1421
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.95	0.71

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	42.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.556
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2125
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.2
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	66.9
Flow in Lanes 1 and 2 (v12), pc/h	4707	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	38.4
Level of Service (LOS)	E	L-71	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7385	1730
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7536	1765
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.88

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	25.9
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.413
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1617
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.000	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2155	Ramp Junction Speed (S), mi/h	57.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	3920	Average Density (D), pc/mi/ln	32.1
Level of Service (LOS)	C	L-72	

*APPENDIX L-X*

**YEAR 2030 BUILDOUT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	10108	1008
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	10314	1029
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.73	0.51

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	24.7
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.521
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1891
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	67.8
Flow in Lanes 1 and 2 (v12), pc/h	3953	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	29.0
Level of Service (LOS)	C	L-74	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8583	1025
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8758	1046
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.70	0.52

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	26.5
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.394
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	1971
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.9
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.087	Outer Lanes Freeway Speed (SO), mi/h	59.7
Flow in Lanes 1 and 2 (v12), pc/h	2627	Ramp Junction Speed (S), mi/h	57.8
Flow Entering Ramp-Infl. Area (vR12), pc/h	3673	Average Density (D), pc/mi/ln	28.3
Level of Service (LOS)	C	L-75	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8553	830
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8728	847
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.74	0.42

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.0
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.504
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1730
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.5
Flow in Lanes 1 and 2 (v12), pc/h	3522	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	29.1
Level of Service (LOS)	C	L-76	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8307	1091
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8477	1113
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.02	0.56

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	36.3
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2543
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	50.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.079	Outer Lanes Freeway Speed (SO), mi/h	57.0
Flow in Lanes 1 and 2 (v12), pc/h	3391	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4504	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-77	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7742	1372
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7900	1400
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.99	0.70

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	35.9
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.643
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/mi/ln	2370
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	50.2
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.043	Outer Lanes Freeway Speed (SO), mi/h	58.0
Flow in Lanes 1 and 2 (v12), pc/h	3160	Ramp Junction Speed (S), mi/h	53.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	4560	Average Density (D), pc/mi/ln	43.1
Level of Service (LOS)	E	L-78	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8659	1270
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8836	1296
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.94	0.65

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	41.1
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.545
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2127
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.5
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	66.9
Flow in Lanes 1 and 2 (v12), pc/h	4583	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	E	L-79	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O.
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7389	1689
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7540	1723
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.86

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	25.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.405
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1618
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.002	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2156	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3879	Average Density (D), pc/mi/ln	31.9
Level of Service (LOS)	C	L-80	

*APPENDIX L-XI*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY ARRIVAL PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	10016	1168
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	10220	1192
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.72	0.60

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	25.3
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.535
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1826
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.7
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.1
Flow in Lanes 1 and 2 (v12), pc/h	4014	Ramp Junction Speed (S), mi/h	59.1
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	28.8
Level of Service (LOS)	C	L-82	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8289	1068
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8458	1090
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.55

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	26.1
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.387
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1903
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	56.1
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.082	Outer Lanes Freeway Speed (SO), mi/h	59.9
Flow in Lanes 1 and 2 (v12), pc/h	2537	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	3627	Average Density (D), pc/mi/ln	27.4
Level of Service (LOS)	C	L-83	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8768	972
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8947	992
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.76	0.50

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	22.4
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.517
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1739
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.1
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.4
Flow in Lanes 1 and 2 (v12), pc/h	3680	Ramp Junction Speed (S), mi/h	59.6
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	30.0
Level of Service (LOS)	C		

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8460	1123
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8633	1146
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.04	0.57

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2590
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	49.7
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.075	Outer Lanes Freeway Speed (SO), mi/h	56.7
Flow in Lanes 1 and 2 (v12), pc/h	3453	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4599	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-85	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7948	1487
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8110	1517
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.02	0.76

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.4
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2433
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	48.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.028	Outer Lanes Freeway Speed (SO), mi/h	57.7
Flow in Lanes 1 and 2 (v12), pc/h	3244	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4761	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-86	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8963	1578
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	9146	1610
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.97	0.81

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	43.7
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.573
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2125
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	51.8
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	66.9
Flow in Lanes 1 and 2 (v12), pc/h	4896	Ramp Junction Speed (S), mi/h	57.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	39.5
Level of Service (LOS)	E	L-87	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Arrival Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7385	1743
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7536	1779
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.89

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	26.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.415
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1617
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.000	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2155	Ramp Junction Speed (S), mi/h	57.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	3934	Average Density (D), pc/mi/ln	32.2
Level of Service (LOS)	C	L-88	

*APPENDIX L-XII*

**YEAR 2030 BUILDOUT PLUS PROJECT  
SATURDAY DEPARTURE PEAK HOUR**

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB Off-Ramp to Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	10129	1029
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	10336	1050
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.73	0.53

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	24.9
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.523
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1890
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	67.8
Flow in Lanes 1 and 2 (v12), pc/h	3972	Ramp Junction Speed (S), mi/h	59.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	29.1
Level of Service (LOS)	C	L-90	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 NB On-Ramp from Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	6	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1155	1155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8583	1178
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8758	1202
Capacity (c), pc/h	14100	2000
Volume-to-Capacity Ratio (v/c)	0.71	0.60

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	27.6
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.420
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1971
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.3
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.068	Outer Lanes Freeway Speed (SO), mi/h	59.7
Flow in Lanes 1 and 2 (v12), pc/h	2627	Ramp Junction Speed (S), mi/h	57.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	3829	Average Density (D), pc/mi/ln	28.9
Level of Service (LOS)	C		

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB Off-Ramp to Nutwood Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8567	844
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8742	861
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.74	0.43

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	21.2
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.505
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1729
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	68.5
Flow in Lanes 1 and 2 (v12), pc/h	3535	Ramp Junction Speed (S), mi/h	59.9
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	29.2
Level of Service (LOS)	C	L-92	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-57 SB On-Ramp from Chapman Avenue	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	615
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8307	1320
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8477	1347
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.05	0.67

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	38.0
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2543
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	48.4
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.049	Outer Lanes Freeway Speed (SO), mi/h	57.0
Flow in Lanes 1 and 2 (v12), pc/h	3391	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4738	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-93	

# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 WB On-Ramp from Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	725
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7742	1602
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7900	1635
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	1.01	0.82

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	37.7
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	-
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2370
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	47.9
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.013	Outer Lanes Freeway Speed (SO), mi/h	58.0
Flow in Lanes 1 and 2 (v12), pc/h	3160	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (vR12), pc/h	4795	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F	L-94	

# HCS7 Freeway Diverge Report

## Project Information

Analyst	JT	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB Off-Ramp to Harbor Boulevard	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	4	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Deceleration Length (LA),ft	1500	290
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	8680	1291
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	8857	1317
Capacity (c), pc/h	9400	2000
Volume-to-Capacity Ratio (v/c)	0.94	0.66

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	41.2
Distance to Upstream Ramp (LUP), ft	-	Speed Index (D)	0.547
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	2127
Distance to Downstream Ramp (LDOWN), ft	10000	Off-Ramp Influenecce Area Speed (SR), mi/h	52.4
Prop. Freeway Vehicles in Lane 1 and 2 (PD)	0.436	Outer Lanes Freeway Speed (SO), mi/h	66.9
Flow in Lanes 1 and 2 (v12), pc/h	4604	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	37.9
Level of Service (LOS)	E	L-95	



# HCS7 Freeway Merge Report

## Project Information

Analyst	AB	Date	11/21/18
Agency	LLG Engineers	Analysis Year	Year 2030 B.O. + Project
Jurisdiction	SR-91 EB On-Ramp from Lemon Street	Time Period Analyzed	Saturday Departure Peak Hour
Project Description	2-18-3897 Sherbeck Field EIR, Fullerton		

## Geometric Data

	Freeway	Ramp
Number of Lanes (N), In	5	1
Free-Flow Speed (FFS), mi/h	65.0	35.0
Segment Length (L) / Acceleration Length (LA),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

## Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

## Demand and Capacity

Demand Volume (Vi)	7389	1750
Peak Hour Factor (PHF)	1.00	1.00
Total Trucks, %	2.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.980	0.980
Flow Rate (vi),pc/h	7540	1786
Capacity (c), pc/h	11750	2000
Volume-to-Capacity Ratio (v/c)	0.79	0.89

## Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Density in Ramp Influence Area (DR), pc/mi/ln	26.1
Distance to Upstream Ramp (LUP), ft	2300	Speed Index (M)	0.417
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (VOA), pc/mi/ln	1618
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	55.4
Prop. Freeway Vehicles in Lane 1 and 2 (PM)	0.000	Outer Lanes Freeway Speed (SO), mi/h	61.0
Flow in Lanes 1 and 2 (v12), pc/h	2156	Ramp Junction Speed (S), mi/h	57.8
Flow Entering Ramp-Infl. Area (vR12), pc/h	3942	Average Density (D), pc/mi/ln	32.3
Level of Service (LOS)	C	L-96	

# APPENDIX M

## EXISTING TRAFFIC COUNT DATA (FRIDAY FIELD EVENT PROJECT ANALYSIS)

*APPENDIX M-1*

**FRIDAY ARRIVAL AND DEPARTURE  
PEAK HOUR INTERSECTION COUNTS**

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1810061  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

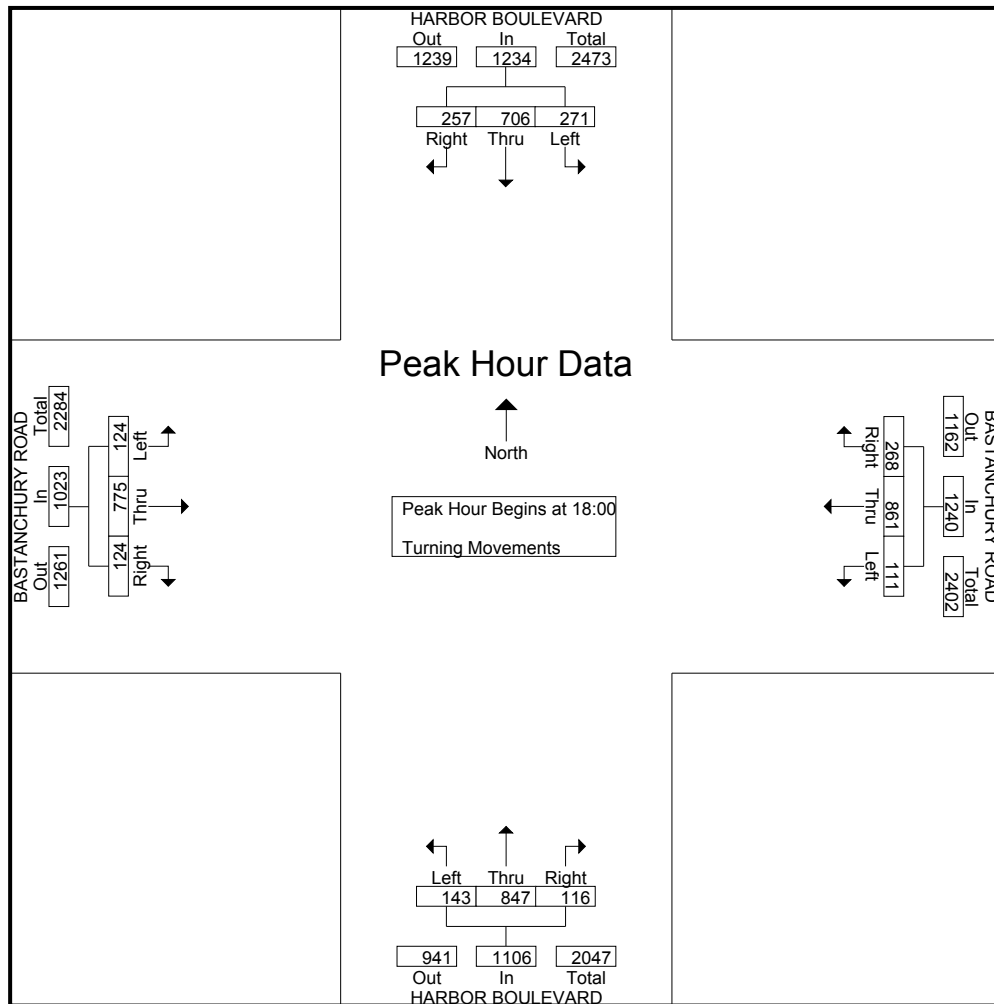
Groups Printed- Turning Movements

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Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	70	184	73	74	212	30	29	234	32	29	222	29	1218
18:15	63	165	71	81	250	33	36	243	33	43	233	43	1294
18:30	78	189	78	55	198	28	26	192	52	26	171	26	1119
18:45	46	168	49	58	201	20	25	178	26	26	149	26	972
Total	257	706	271	268	861	111	116	847	143	124	775	124	4603
19:00	44	154	39	57	200	29	19	176	40	23	141	23	945
19:15	44	113	41	47	161	38	19	149	26	13	117	13	781
19:30	40	116	39	38	148	29	15	119	36	12	58	12	662
19:45	45	126	40	43	117	9	10	129	19	16	95	16	665
Total	173	509	159	185	626	105	63	573	121	64	411	64	3053
*** BREAK ***													
21:00	29	86	24	24	111	11	19	136	15	4	60	32	551
21:15	32	73	22	30	120	13	8	95	13	11	66	27	510
21:30	24	82	35	25	85	10	14	100	24	6	57	29	491
21:45	29	81	31	24	97	12	18	119	20	8	63	28	530
Total	114	322	112	103	413	46	59	450	72	29	246	116	2082
22:00	22	69	30	15	71	13	31	109	22	9	87	26	504
22:15	22	85	16	30	63	17	9	122	12	6	70	25	477
22:30	18	69	20	23	56	5	9	93	9	10	49	25	386
22:45	18	53	16	21	50	8	8	75	9	4	48	25	335
Total	80	276	82	89	240	43	57	399	52	29	254	101	1702
Grand Total	624	1813	624	645	2140	305	295	2269	388	246	1686	405	11440
Apprch %	20.4	59.2	20.4	20.9	69.3	9.9	10	76.9	13.1	10.5	72.1	17.3	
Total %	5.5	15.8	5.5	5.6	18.7	2.7	2.6	19.8	3.4	2.2	14.7	3.5	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1810061  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

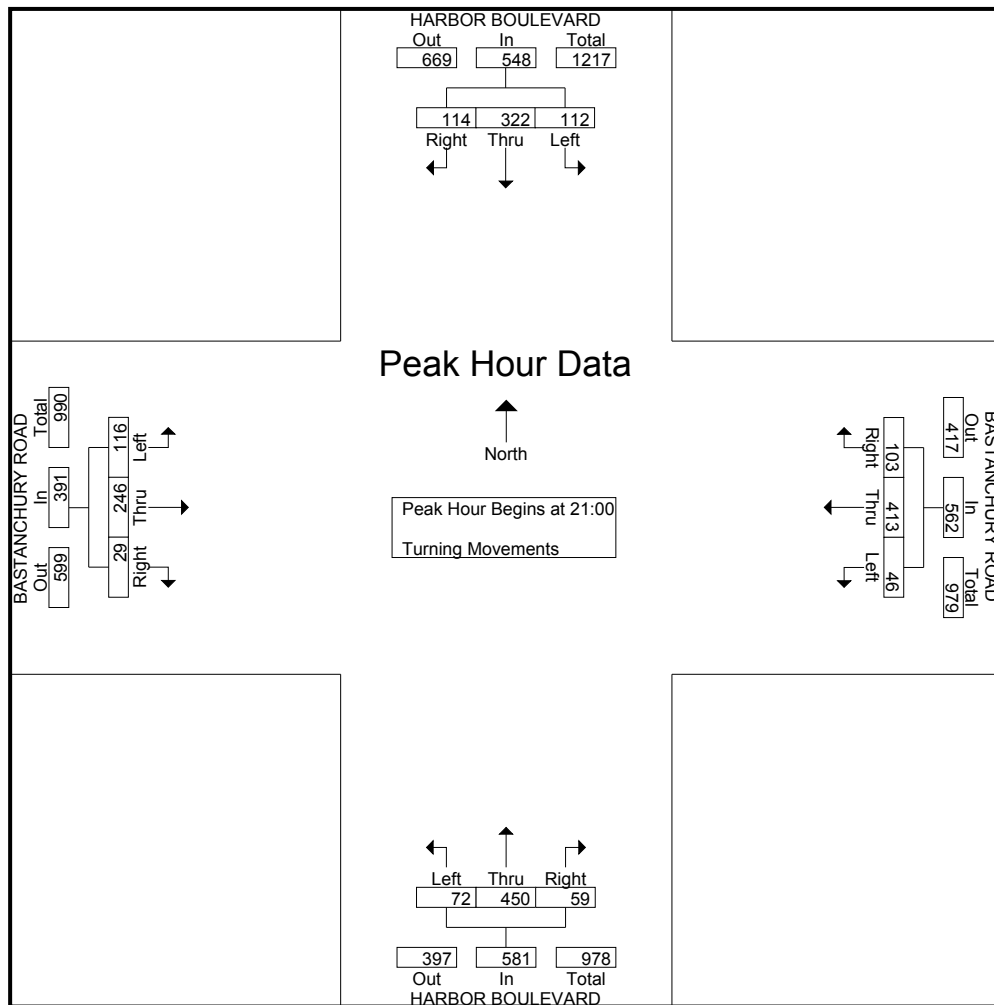
	HARBOR BOULEVARD Southbound				BASTANCHURY ROAD Westbound				HARBOR BOULEVARD Northbound				BASTANCHURY ROAD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	70	184	73	327	74	212	30	316	29	234	32	295	29	222	29	280	1218
18:15	63	165	71	299	81	250	33	364	36	243	33	312	43	233	43	319	1294
18:30	78	189	78	345	55	198	28	281	26	192	52	270	26	171	26	223	1119
18:45	46	168	49	263	58	201	20	279	25	178	26	229	26	149	26	201	972
Total Volume	257	706	271	1234	268	861	111	1240	116	847	143	1106	124	775	124	1023	4603
% App. Total	20.8	57.2	22		21.6	69.4	9		10.5	76.6	12.9		12.1	75.8	12.1		
PHF	.824	.934	.869	.894	.827	.861	.841	.852	.806	.871	.688	.886	.721	.832	.721	.802	.889



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BASTANCHURY ROAD

File Name : H1810061  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				BASTANCHURY ROAD Westbound				HARBOR BOULEVARD Northbound				BASTANCHURY ROAD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	29	86	24	139	24	111	11	146	19	136	15	170	4	60	32	96	551
21:15	32	73	22	127	30	120	13	163	8	95	13	116	11	66	27	104	510
21:30	24	82	35	141	25	85	10	120	14	100	24	138	6	57	29	92	491
21:45	29	81	31	141	24	97	12	133	18	119	20	157	8	63	28	99	530
Total Volume	114	322	112	548	103	413	46	562	59	450	72	581	29	246	116	391	2082
% App. Total	20.8	58.8	20.4		18.3	73.5	8.2		10.2	77.5	12.4		7.4	62.9	29.7		
PHF	.891	.936	.800	.972	.858	.860	.885	.862	.776	.827	.750	.854	.659	.932	.906	.940	.945



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW/BREA BLVD

File Name : H1810062  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

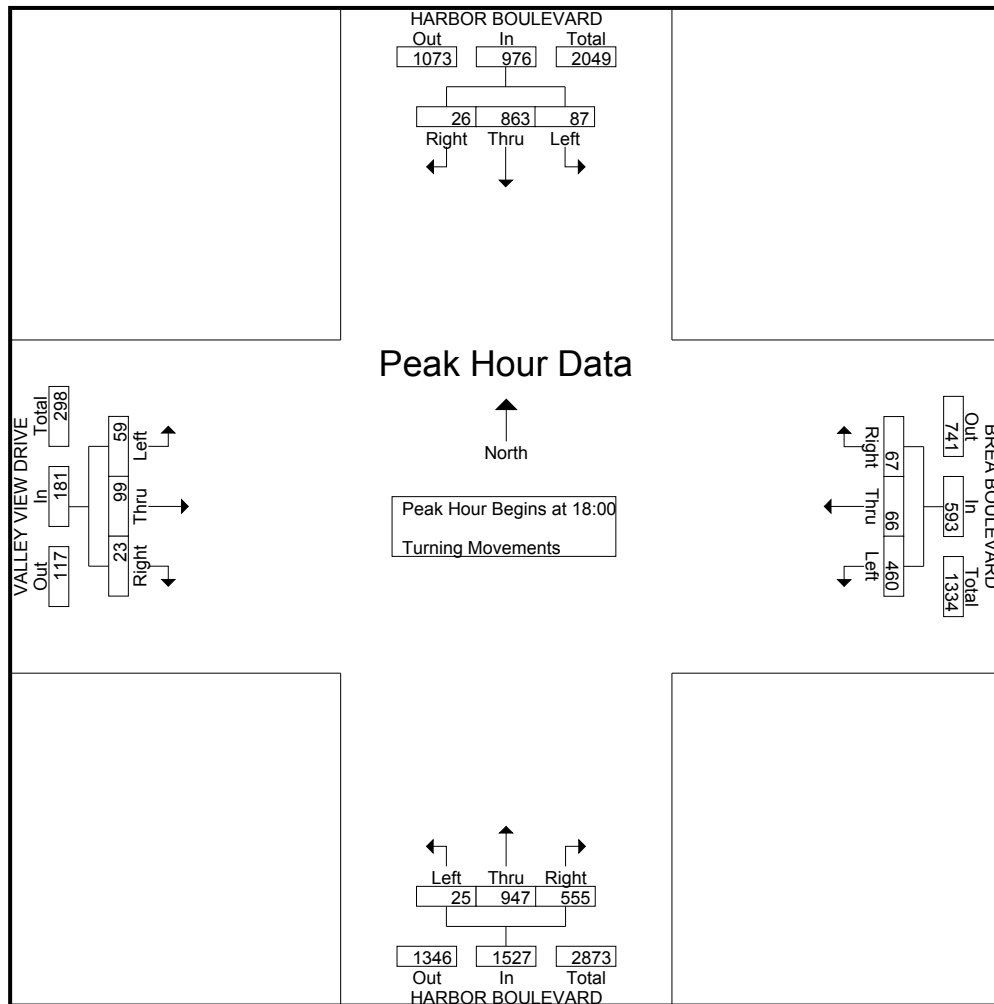
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			BREA BOULEVARD Westbound			HARBOR BOULEVARD Northbound			VALLEY VIEW DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	7	222	17	22	14	115	163	262	9	4	32	22	889
18:15	8	202	27	21	24	123	125	258	3	7	15	12	825
18:30	6	227	29	11	18	106	126	219	7	9	31	18	807
18:45	5	212	14	13	10	116	141	208	6	3	21	7	756
Total	26	863	87	67	66	460	555	947	25	23	99	59	3277
19:00	3	184	17	16	15	92	117	213	2	3	18	11	691
19:15	2	176	17	22	10	102	95	155	2	4	18	5	608
19:30	5	147	14	9	17	71	106	172	5	6	13	2	567
19:45	0	144	9	14	6	75	99	162	5	1	5	4	524
Total	10	651	57	61	48	340	417	702	14	14	54	22	2390
*** BREAK ***													
21:00	1	121	7	14	10	79	63	123	6	4	5	6	439
21:15	3	95	5	8	3	57	64	125	3	2	8	6	379
21:30	2	83	5	6	8	68	56	105	1	2	7	2	345
21:45	0	103	14	4	7	53	71	112	6	2	4	2	378
Total	6	402	31	32	28	257	254	465	16	10	24	16	1541
22:00	1	98	7	3	3	46	59	131	1	2	3	1	355
22:15	0	107	5	7	7	49	69	137	5	1	9	2	398
22:30	5	104	3	2	4	46	56	91	3	1	2	1	318
22:45	3	61	3	4	2	30	42	98	2	3	2	4	254
Total	9	370	18	16	16	171	226	457	11	7	16	8	1325
Grand Total	51	2286	193	176	158	1228	1452	2571	66	54	193	105	8533
Apprch %	2	90.4	7.6	11.3	10.1	78.6	35.5	62.9	1.6	15.3	54.8	29.8	
Total %	0.6	26.8	2.3	2.1	1.9	14.4	17	30.1	0.8	0.6	2.3	1.2	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW/BREA BLVD

File Name : H1810062  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

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Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	7	222	17	246	22	14	115	151	163	262	9	434	4	32	22	58	889
18:15	8	202	27	237	21	24	123	168	125	258	3	386	7	15	12	34	825
18:30	6	227	29	262	11	18	106	135	126	219	7	352	9	31	18	58	807
18:45	5	212	14	231	13	10	116	139	141	208	6	355	3	21	7	31	756
Total Volume	26	863	87	976	67	66	460	593	555	947	25	1527	23	99	59	181	3277
% App. Total	2.7	88.4	8.9		11.3	11.1	77.6		36.3	62	1.6		12.7	54.7	32.6		
PHF	.813	.950	.750	.931	.761	.688	.935	.882	.851	.904	.694	.880	.639	.773	.670	.780	.922

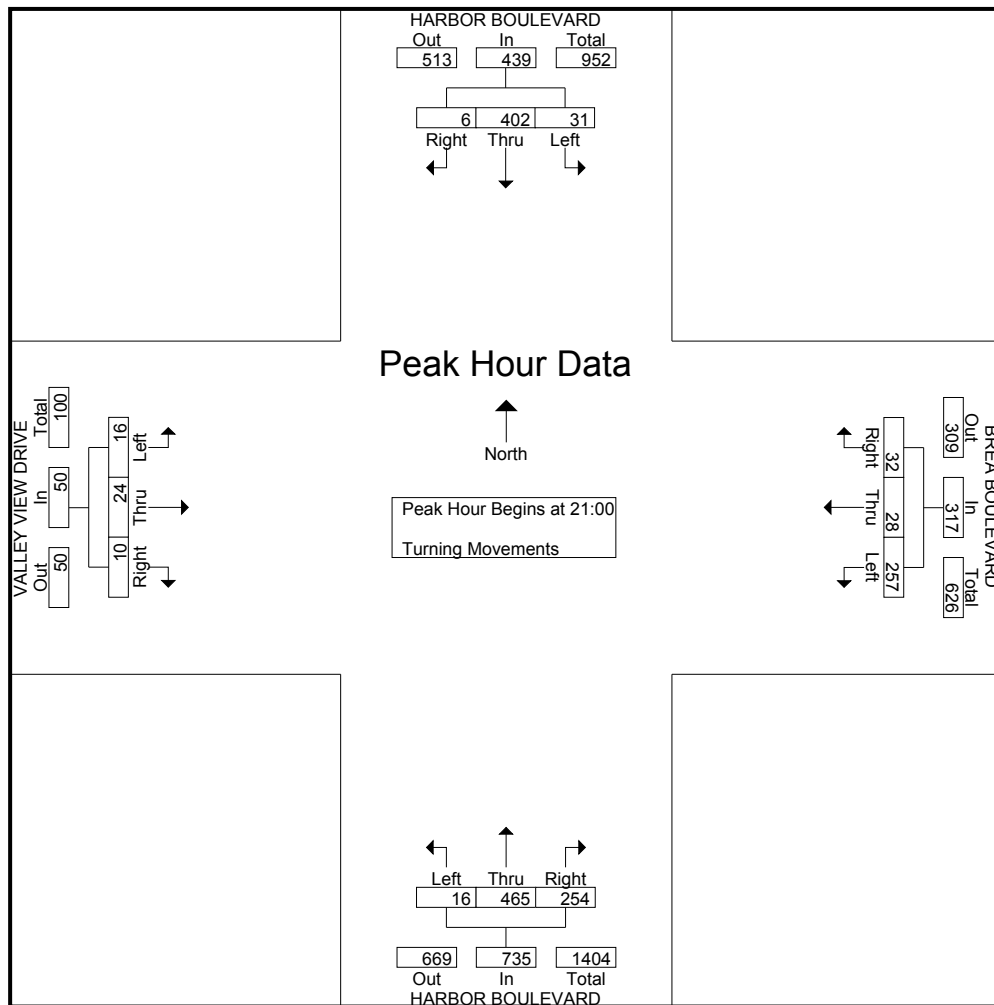




City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALLEY VIEW/BREA BLVD

File Name : H1810062  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				BREA BOULEVARD Westbound				HARBOR BOULEVARD Northbound				VALLEY VIEW DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	1	121	7	129	14	10	79	103	63	123	6	192	4	5	6	15	439
21:15	3	95	5	103	8	3	57	68	64	125	3	192	2	8	6	16	379
21:30	2	83	5	90	6	8	68	82	56	105	1	162	2	7	2	11	345
21:45	0	103	14	117	4	7	53	64	71	112	6	189	2	4	2	8	378
Total Volume	6	402	31	439	32	28	257	317	254	465	16	735	10	24	16	50	1541
% App. Total	1.4	91.6	7.1		10.1	8.8	81.1		34.6	63.3	2.2		20	48	32		
PHF	.500	.831	.554	.851	.571	.700	.813	.769	.894	.930	.667	.957	.625	.750	.667	.781	.878



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1810063  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

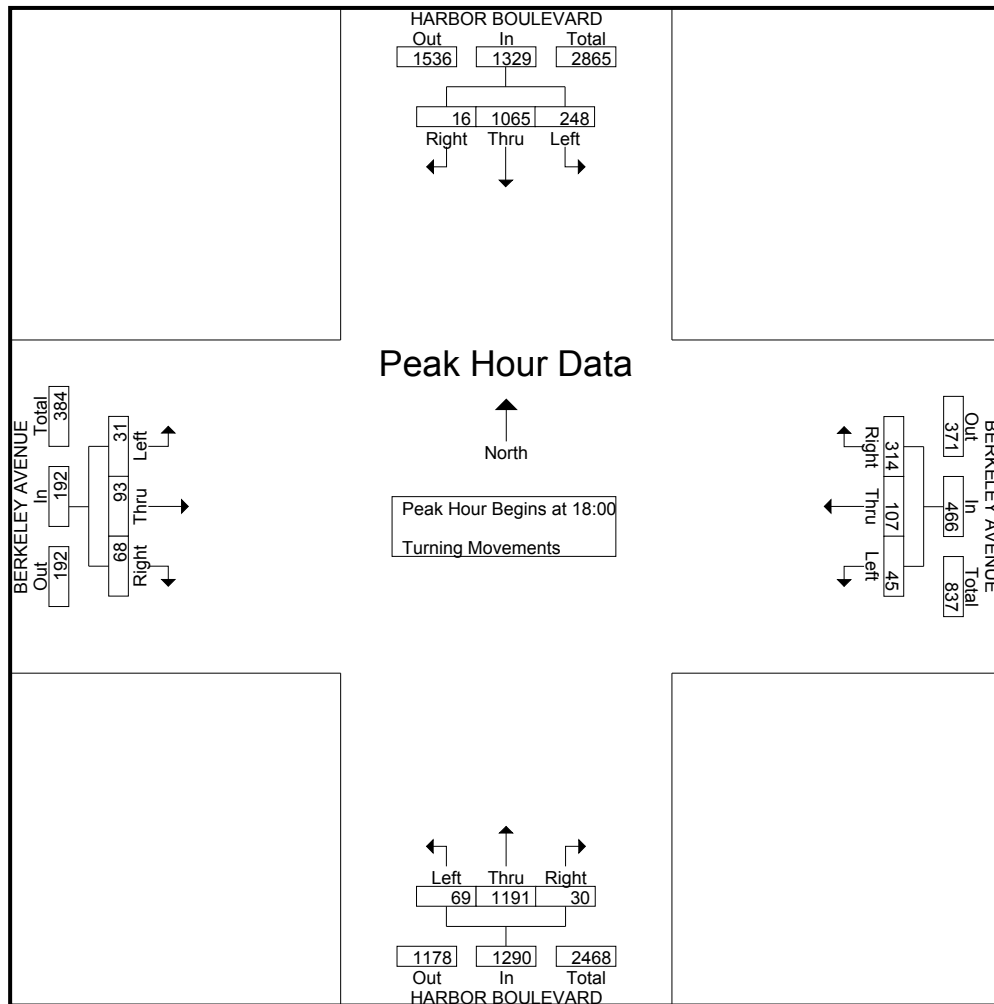
Groups Printed- Turning Movements

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Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	4	272	70	95	33	18	7	320	20	17	16	4	876
18:15	6	270	54	76	28	11	11	299	18	16	35	7	831
18:30	2	267	70	72	26	6	7	280	15	15	24	8	792
18:45	4	256	54	71	20	10	5	292	16	20	18	12	778
Total	16	1065	248	314	107	45	30	1191	69	68	93	31	3277
19:00	7	254	54	53	12	8	17	260	12	15	18	3	713
19:15	8	237	28	54	14	15	9	224	12	8	15	9	633
19:30	3	202	33	38	23	12	11	235	9	9	14	5	594
19:45	1	193	34	45	18	5	8	207	9	8	9	2	539
Total	19	886	149	190	67	40	45	926	42	40	56	19	2479
*** BREAK ***													
21:00	1	159	26	35	11	8	3	153	8	8	6	4	422
21:15	4	146	24	40	9	8	5	144	11	4	5	6	406
21:30	0	122	19	24	19	13	7	162	13	7	11	3	400
21:45	2	135	21	37	11	18	5	160	8	6	11	2	416
Total	7	562	90	136	50	47	20	619	40	25	33	15	1644
22:00	2	133	31	47	16	23	9	145	4	4	11	6	431
22:15	1	139	26	45	6	9	14	167	6	7	5	5	430
22:30	1	127	12	31	5	5	2	121	5	5	1	2	317
22:45	1	90	13	16	4	5	3	135	8	5	3	3	286
Total	5	489	82	139	31	42	28	568	23	21	20	16	1464
Grand Total	47	3002	569	779	255	174	123	3304	174	154	202	81	8864
Apprch %	1.3	83	15.7	64.5	21.1	14.4	3.4	91.8	4.8	35.2	46.2	18.5	
Total %	0.5	33.9	6.4	8.8	2.9	2	1.4	37.3	2	1.7	2.3	0.9	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1810063  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

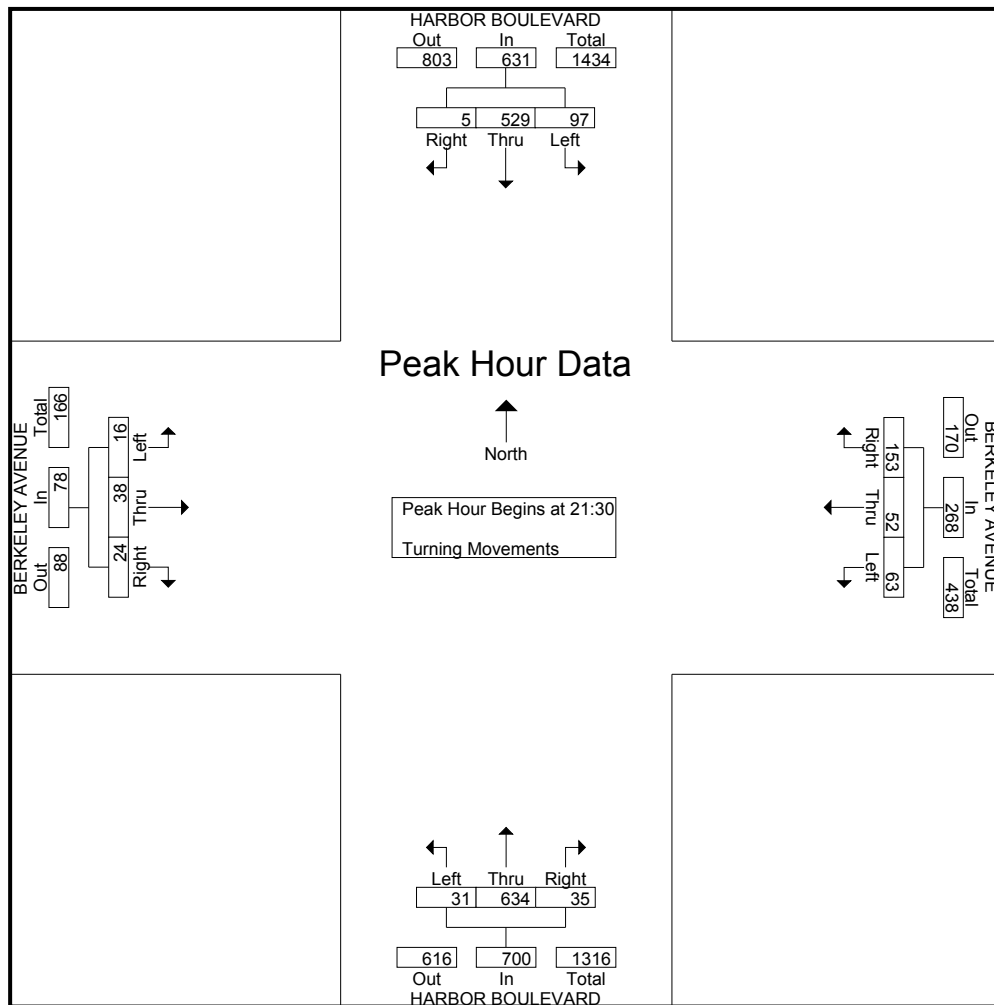
	HARBOR BOULEVARD Southbound				BERKELEY AVENUE Westbound				HARBOR BOULEVARD Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	4	272	70	346	95	33	18	146	7	320	20	347	17	16	4	37	876
18:15	6	270	54	330	76	28	11	115	11	299	18	328	16	35	7	58	831
18:30	2	267	70	339	72	26	6	104	7	280	15	302	15	24	8	47	792
18:45	4	256	54	314	71	20	10	101	5	292	16	313	20	18	12	50	778
Total Volume	16	1065	248	1329	314	107	45	466	30	1191	69	1290	68	93	31	192	3277
% App. Total	1.2	80.1	18.7		67.4	23	9.7		2.3	92.3	5.3		35.4	48.4	16.1		
PHF	.667	.979	.886	.960	.826	.811	.625	.798	.682	.930	.863	.929	.850	.664	.646	.828	.935



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: BERKELEY AVENUE

File Name : H1810063  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				BERKELEY AVENUE Westbound				HARBOR BOULEVARD Northbound				BERKELEY AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	0	122	19	141	24	19	13	56	7	162	13	182	7	11	3	21	400
21:45	2	135	21	158	37	11	18	66	5	160	8	173	6	11	2	19	416
22:00	2	133	31	166	47	16	23	86	9	145	4	158	4	11	6	21	431
22:15	1	139	26	166	45	6	9	60	14	167	6	187	7	5	5	17	430
Total Volume	5	529	97	631	153	52	63	268	35	634	31	700	24	38	16	78	1677
% App. Total	0.8	83.8	15.4		57.1	19.4	23.5		5	90.6	4.4		30.8	48.7	20.5		
PHF	.625	.951	.782	.950	.814	.684	.685	.779	.625	.949	.596	.936	.857	.864	.667	.929	.973



CITY: FULLERTON  
N/S: LEMON STREET  
E/W: BERKELEY AVENUE  
Weather: Clear

File Name : H1810064  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

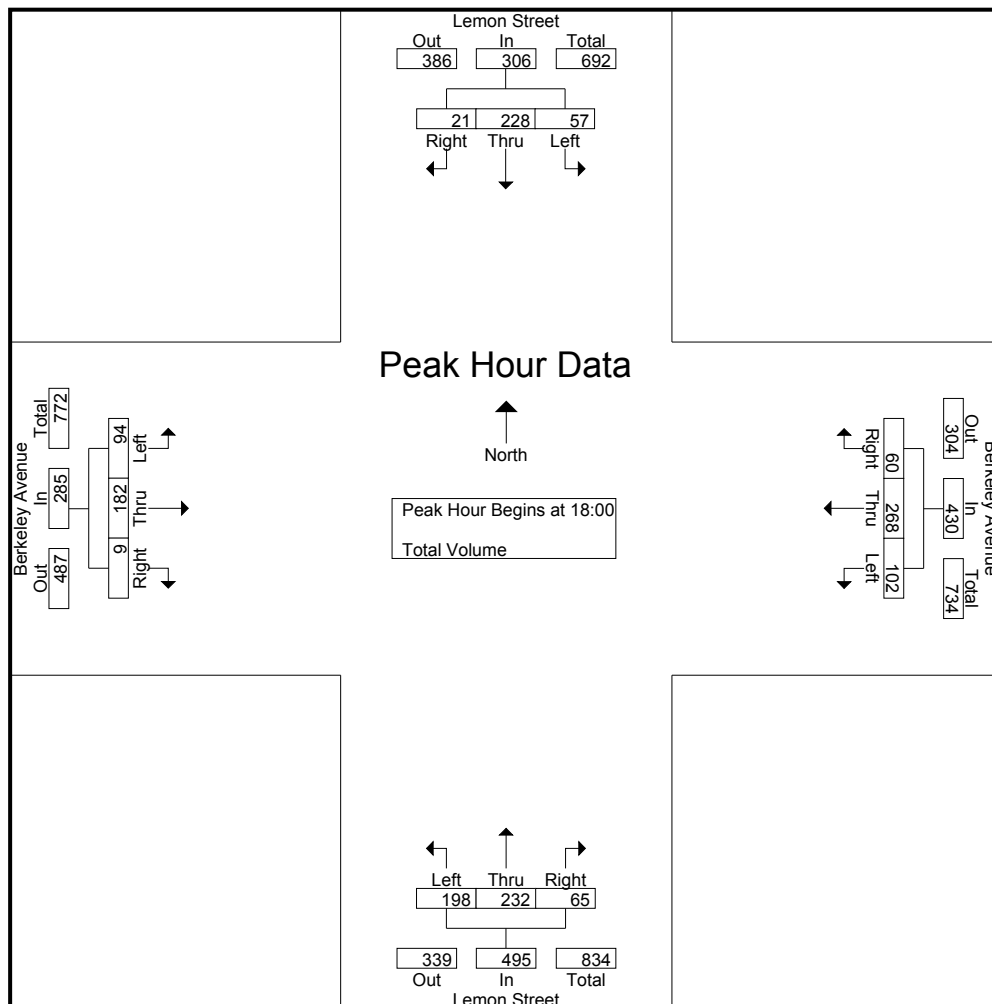
Groups Printed- Total Volume

	Lemon Street Southbound			Berkeley Avenue Westbound			Lemon Street Northbound			Berkeley Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	7	61	14	22	82	19	11	74	61	1	51	22	425
18:15	5	48	10	13	68	20	13	66	42	5	51	24	365
18:30	5	56	22	13	63	27	20	46	46	2	45	27	372
18:45	4	63	11	12	55	36	21	46	49	1	35	21	354
Total	21	228	57	60	268	102	65	232	198	9	182	94	1516
19:00	6	65	11	8	32	22	21	55	37	3	36	25	321
19:15	8	39	12	11	36	12	13	41	41	5	20	15	253
19:30	3	38	8	9	39	13	13	32	31	1	35	12	234
19:45	1	18	12	8	41	8	11	39	32	3	31	10	214
Total	18	160	43	36	148	55	58	167	141	12	122	62	1022
21:00	11	21	1	4	30	12	8	23	25	2	22	0	159
21:15	8	28	2	11	32	6	7	24	23	9	16	4	170
21:30	6	27	2	8	33	12	10	35	20	20	19	2	194
21:45	6	21	3	11	27	15	18	30	32	17	25	1	206
Total	31	97	8	34	122	45	43	112	100	48	82	7	729
22:00	10	35	4	12	29	23	38	47	51	33	30	5	317
22:15	4	17	4	11	18	14	34	33	39	24	28	0	226
22:30	4	20	2	5	17	6	9	21	18	8	12	2	124
22:45	1	13	1	7	15	4	5	23	10	6	12	2	99
Total	19	85	11	35	79	47	86	124	118	71	82	9	766
Grand Total	89	570	119	165	617	249	252	635	557	140	468	172	4033
Apprch %	11.4	73.3	15.3	16	59.8	24.2	17.5	44	38.6	17.9	60	22.1	
Total %	2.2	14.1	3	4.1	15.3	6.2	6.2	15.7	13.8	3.5	11.6	4.3	

CITY: FULLERTON  
N/S: LEMON STREET  
E/W: BERKELEY AVENUE  
Weather: Clear

File Name : H1810064  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

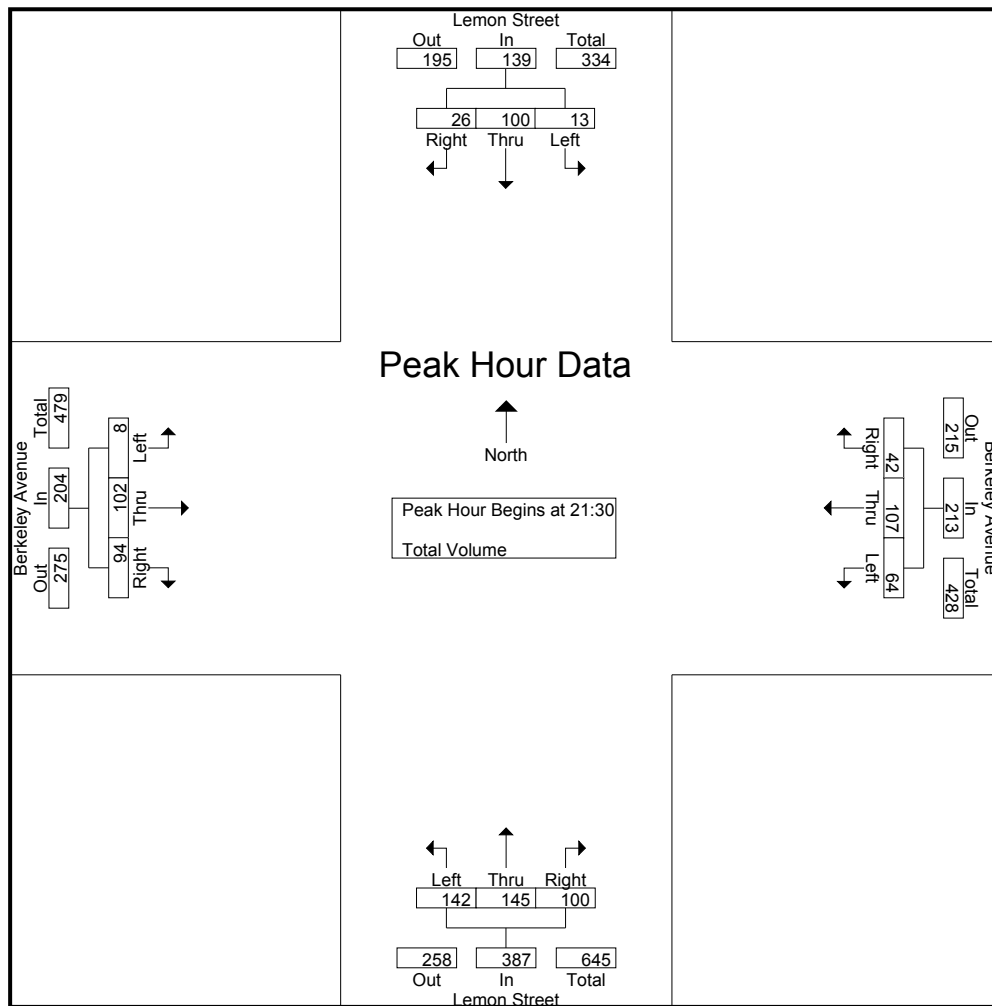
	Lemon Street Southbound				Berkeley Avenue Westbound				Lemon Street Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	7	61	14	82	22	82	19	123	11	74	61	146	1	51	22	74	425
18:15	5	48	10	63	13	68	20	101	13	66	42	121	5	51	24	80	365
18:30	5	56	22	83	13	63	27	103	20	46	46	112	2	45	27	74	372
18:45	4	63	11	78	12	55	36	103	21	46	49	116	1	35	21	57	354
Total Volume	21	228	57	306	60	268	102	430	65	232	198	495	9	182	94	285	1516
% App. Total	6.9	74.5	18.6		14	62.3	23.7		13.1	46.9	40		3.2	63.9	33		
PHF	.750	.905	.648	.922	.682	.817	.708	.874	.774	.784	.811	.848	.450	.892	.870	.891	.892



CITY: FULLERTON  
N/S: LEMON STREET  
E/W: BERKELEY AVENUE  
Weather: Clear

File Name : H1810064  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Lemon Street Southbound				Berkeley Avenue Westbound				Lemon Street Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	6	27	2	35	8	33	12	53	10	35	20	65	20	19	2	41	194
21:45	6	21	3	30	11	27	15	53	18	30	32	80	17	25	1	43	206
22:00	10	35	4	49	12	29	23	64	38	47	51	136	33	30	5	68	317
22:15	4	17	4	25	11	18	14	43	34	33	39	106	24	28	0	52	226
Total Volume	26	100	13	139	42	107	64	213	100	145	142	387	94	102	8	204	943
% App. Total	18.7	71.9	9.4		19.7	50.2	30		25.8	37.5	36.7		46.1	50	3.9		
PHF	.650	.714	.813	.709	.875	.811	.696	.832	.658	.771	.696	.711	.712	.850	.400	.750	.744



CITY: FULLERTON  
N/S: HORNET WAY  
E/W: BERKELEY AVENUE

File Name : h1810065  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

Groups Printed- Turning Movements

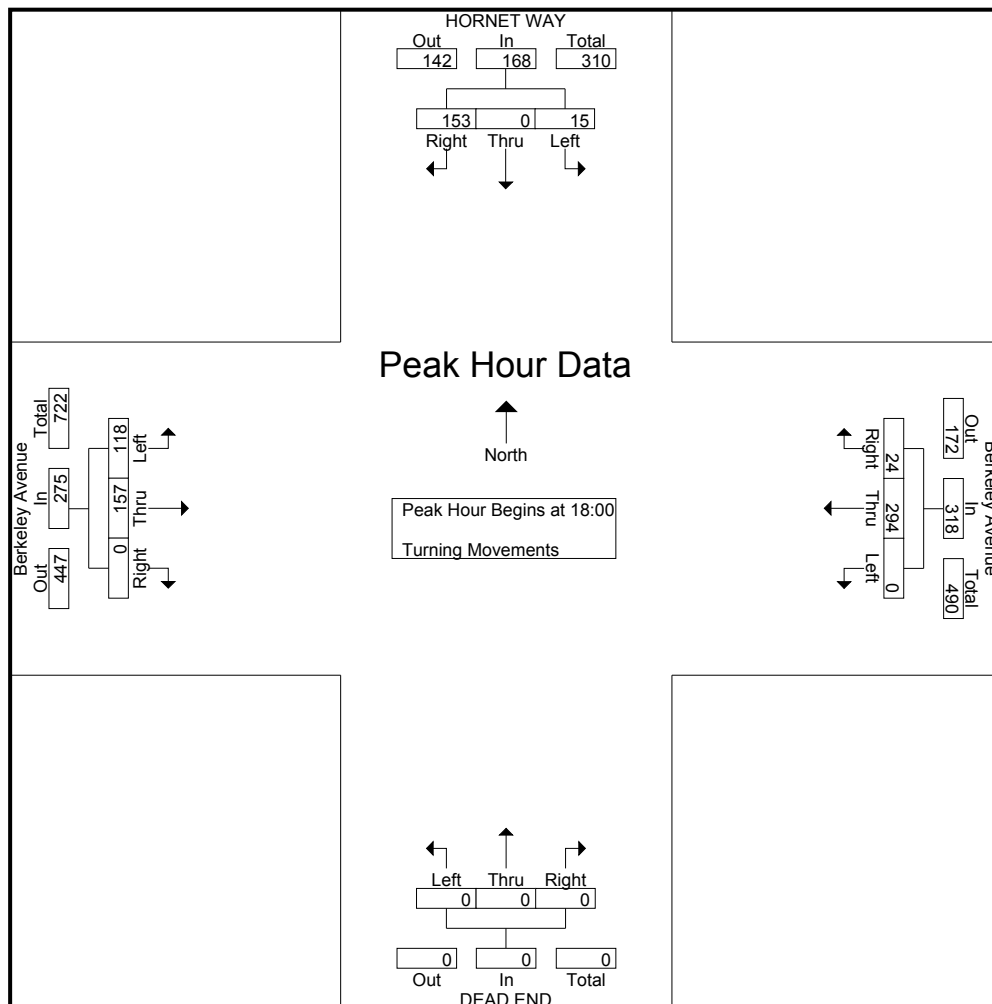
	HORNET WAY Southbound			Berkeley Avenue Westbound			DEAD END Northbound			Berkeley Avenue Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	39	0	3	5	92	0	0	0	0	0	54	25	218
18:15	31	0	4	7	67	0	0	0	0	0	31	35	175
18:30	37	0	6	3	65	0	0	0	0	0	42	30	183
18:45	46	0	2	9	70	0	0	0	0	0	30	28	185
Total	153	0	15	24	294	0	0	0	0	0	157	118	761
19:00	22	0	3	3	38	0	0	0	0	0	44	24	134
19:15	31	0	1	3	29	0	0	0	0	0	31	19	114
19:30	16	0	1	4	42	0	0	0	0	0	28	22	113
19:45	16	0	3	2	38	0	0	0	0	0	32	20	111
Total	85	0	8	12	147	0	0	0	0	0	135	85	472
21:00	0	0	22	5	25	0	0	0	0	0	17	18	87
21:15	5	0	22	5	24	0	0	0	0	0	16	17	89
21:30	1	0	18	11	29	0	0	0	0	0	24	13	96
21:45	1	0	24	4	22	0	0	0	0	0	28	23	102
Total	7	0	86	25	100	0	0	0	0	0	85	71	374
22:00	6	0	17	4	26	0	0	0	0	0	46	41	140
22:15	0	0	14	1	24	0	0	0	0	0	29	42	110
22:30	2	0	7	2	21	0	0	0	0	0	20	8	60
22:45	3	0	11	5	15	0	0	0	0	0	12	6	52
Total	11	0	49	12	86	0	0	0	0	0	107	97	362
Grand Total	256	0	158	73	627	0	0	0	0	0	484	371	1969
Apprch %	61.8	0	38.2	10.4	89.6	0	0	0	0	0	56.6	43.4	
Total %	13	0	8	3.7	31.8	0	0	0	0	0	24.6	18.8	



CITY: FULLERTON  
N/S: HORNET WAY  
E/W: BERKELEY AVENUE

File Name : h1810065  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

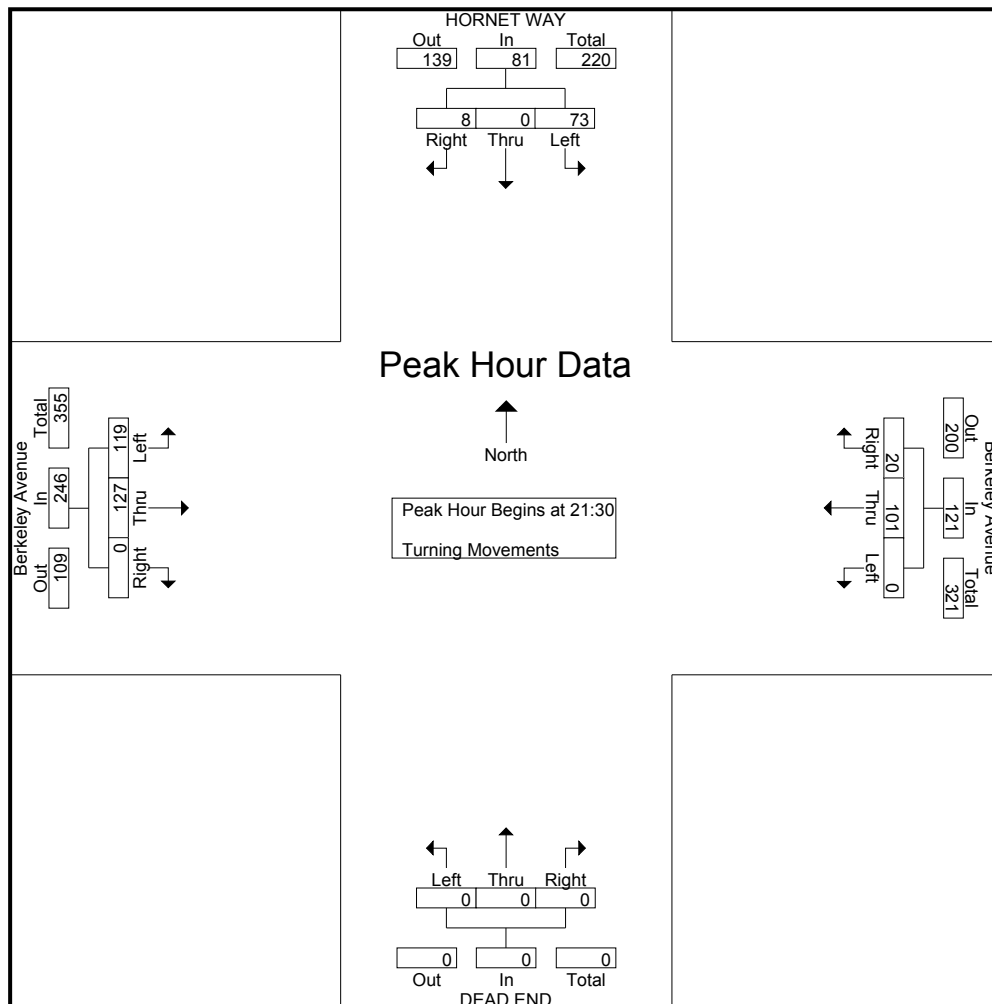
	HORNET WAY Southbound				Berkeley Avenue Westbound				DEAD END Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	39	0	3	42	5	92	0	97	0	0	0	0	0	54	25	79	218
18:15	31	0	4	35	7	67	0	74	0	0	0	0	0	31	35	66	175
18:30	37	0	6	43	3	65	0	68	0	0	0	0	0	42	30	72	183
18:45	46	0	2	48	9	70	0	79	0	0	0	0	0	30	28	58	185
Total Volume	153	0	15	168	24	294	0	318	0	0	0	0	0	157	118	275	761
% App. Total	91.1	0	8.9		7.5	92.5	0		0	0	0		0	57.1	42.9		
PHF	.832	.000	.625	.875	.667	.799	.000	.820	.000	.000	.000	.000	.000	.727	.843	.870	.873



CITY: FULLERTON  
N/S: HORNET WAY  
E/W: BERKELEY AVENUE

File Name : h1810065  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	HORNET WAY Southbound				Berkeley Avenue Westbound				DEAD END Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	1	0	18	19	11	29	0	40	0	0	0	0	0	24	13	37	96
21:45	1	0	24	25	4	22	0	26	0	0	0	0	0	28	23	51	102
22:00	6	0	17	23	4	26	0	30	0	0	0	0	0	46	41	87	140
22:15	0	0	14	14	1	24	0	25	0	0	0	0	0	29	42	71	110
Total Volume	8	0	73	81	20	101	0	121	0	0	0	0	0	127	119	246	448
% App. Total	9.9	0	90.1		16.5	83.5	0		0	0	0		0	51.6	48.4		
PHF	.333	.000	.760	.810	.455	.871	.000	.756	.000	.000	.000	.000	.000	.690	.708	.707	.800



City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: MALVERN AVENUE

File Name : H1810066  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

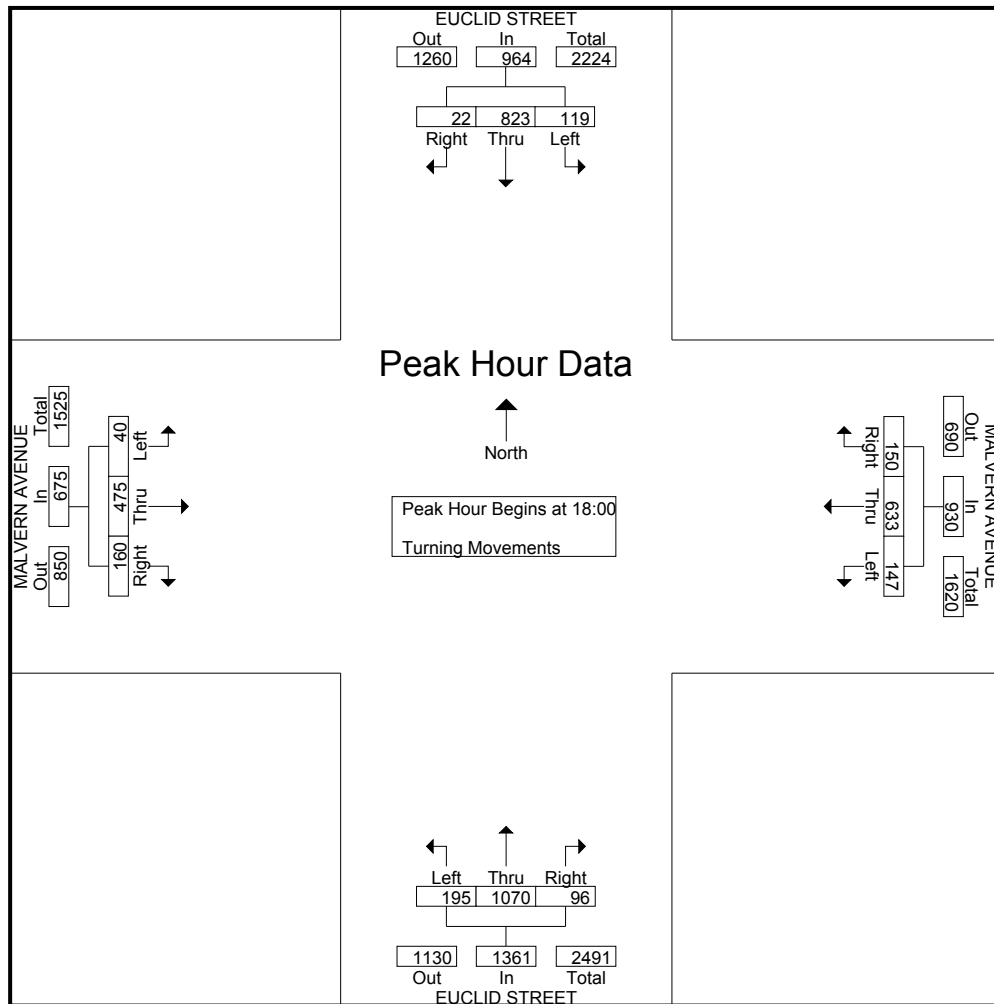
Groups Printed- Turning Movements

	EUCLID STREET Southbound			MALVERN AVENUE Westbound			EUCLID STREET Northbound			MALVERN AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	6	220	28	47	197	34	21	309	53	50	113	13	1091
18:15	4	189	36	41	181	42	21	293	52	26	119	10	1014
18:30	5	209	28	32	131	39	26	241	46	45	122	6	930
18:45	7	205	27	30	124	32	28	227	44	39	121	11	895
Total	22	823	119	150	633	147	96	1070	195	160	475	40	3930
19:00	3	194	24	17	125	44	18	190	59	34	107	6	821
19:15	5	169	24	18	115	33	32	206	51	49	105	5	812
19:30	6	180	14	26	120	31	22	199	37	43	69	6	753
19:45	4	121	14	21	79	32	21	184	41	24	61	9	611
Total	18	664	76	82	439	140	93	779	188	150	342	26	2997
*** BREAK ***													
21:00	3	98	12	12	69	27	21	106	21	24	58	7	458
21:15	3	82	10	9	76	21	19	140	16	19	64	3	462
21:30	5	117	5	13	79	17	17	121	21	25	52	4	476
21:45	0	108	11	16	53	11	31	118	20	22	39	5	434
Total	11	405	38	50	277	76	88	485	78	90	213	19	1830
22:00	6	91	7	11	85	30	21	134	18	19	46	4	472
22:15	2	86	11	19	72	27	23	111	20	29	49	2	451
22:30	1	68	6	8	59	24	9	136	26	12	42	1	392
22:45	2	69	11	9	39	16	17	78	14	17	34	2	308
Total	11	314	35	47	255	97	70	459	78	77	171	9	1623
Grand Total	62	2206	268	329	1604	460	347	2793	539	477	1201	94	10380
Apprch %	2.4	87	10.6	13.7	67	19.2	9.4	75.9	14.7	26.9	67.8	5.3	
Total %	0.6	21.3	2.6	3.2	15.5	4.4	3.3	26.9	5.2	4.6	11.6	0.9	

City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: MALVERN AVENUE

File Name : H1810066  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

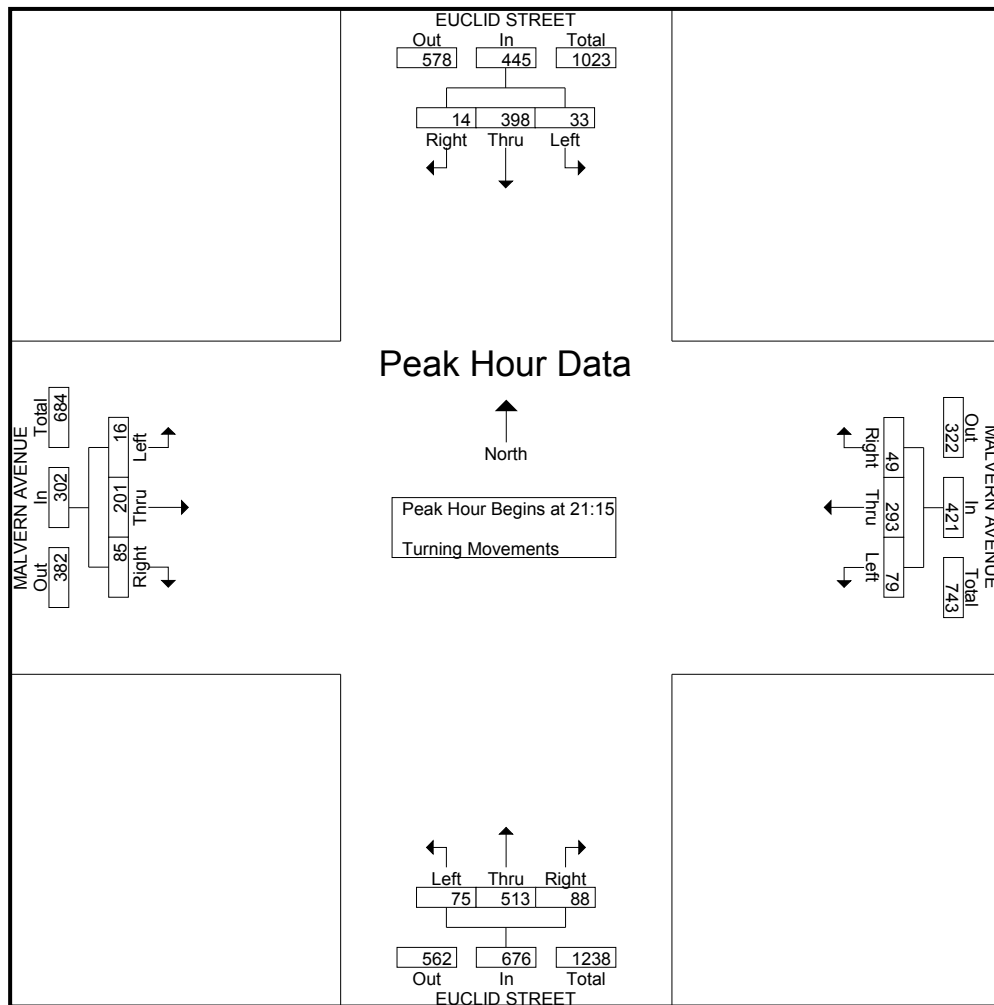
	EUCLID STREET Southbound				MALVERN AVENUE Westbound				EUCLID STREET Northbound				MALVERN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	6	220	28	254	47	197	34	278	21	309	53	383	50	113	13	176	1091
18:15	4	189	36	229	41	181	42	264	21	293	52	366	26	119	10	155	1014
18:30	5	209	28	242	32	131	39	202	26	241	46	313	45	122	6	173	930
18:45	7	205	27	239	30	124	32	186	28	227	44	299	39	121	11	171	895
Total Volume	22	823	119	964	150	633	147	930	96	1070	195	1361	160	475	40	675	3930
% App. Total	2.3	85.4	12.3		16.1	68.1	15.8		7.1	78.6	14.3		23.7	70.4	5.9		
PHF	.786	.935	.826	.949	.798	.803	.875	.836	.857	.866	.920	.888	.800	.973	.769	.959	.901



City: FULLERTON  
N-S Direction: EUCLID STREET  
E-W Direction: MALVERN AVENUE

File Name : H1810066  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	EUCLID STREET Southbound				MALVERN AVENUE Westbound				EUCLID STREET Northbound				MALVERN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	3	82	10	95	9	76	21	106	19	140	16	175	19	64	3	86	462
21:30	5	117	5	127	13	79	17	109	17	121	21	159	25	52	4	81	476
21:45	0	108	11	119	16	53	11	80	31	118	20	169	22	39	5	66	434
22:00	6	91	7	104	11	85	30	126	21	134	18	173	19	46	4	69	472
Total Volume	14	398	33	445	49	293	79	421	88	513	75	676	85	201	16	302	1844
% App. Total	3.1	89.4	7.4		11.6	69.6	18.8		13	75.9	11.1		28.1	66.6	5.3		
PHF	.583	.850	.750	.876	.766	.862	.658	.835	.710	.916	.893	.966	.850	.785	.800	.878	.968



CITY: FULLERTON  
N/S: HARBOR BOULEVARD  
E/W: CHAPMAN AVENUE

File Name : H1810067  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

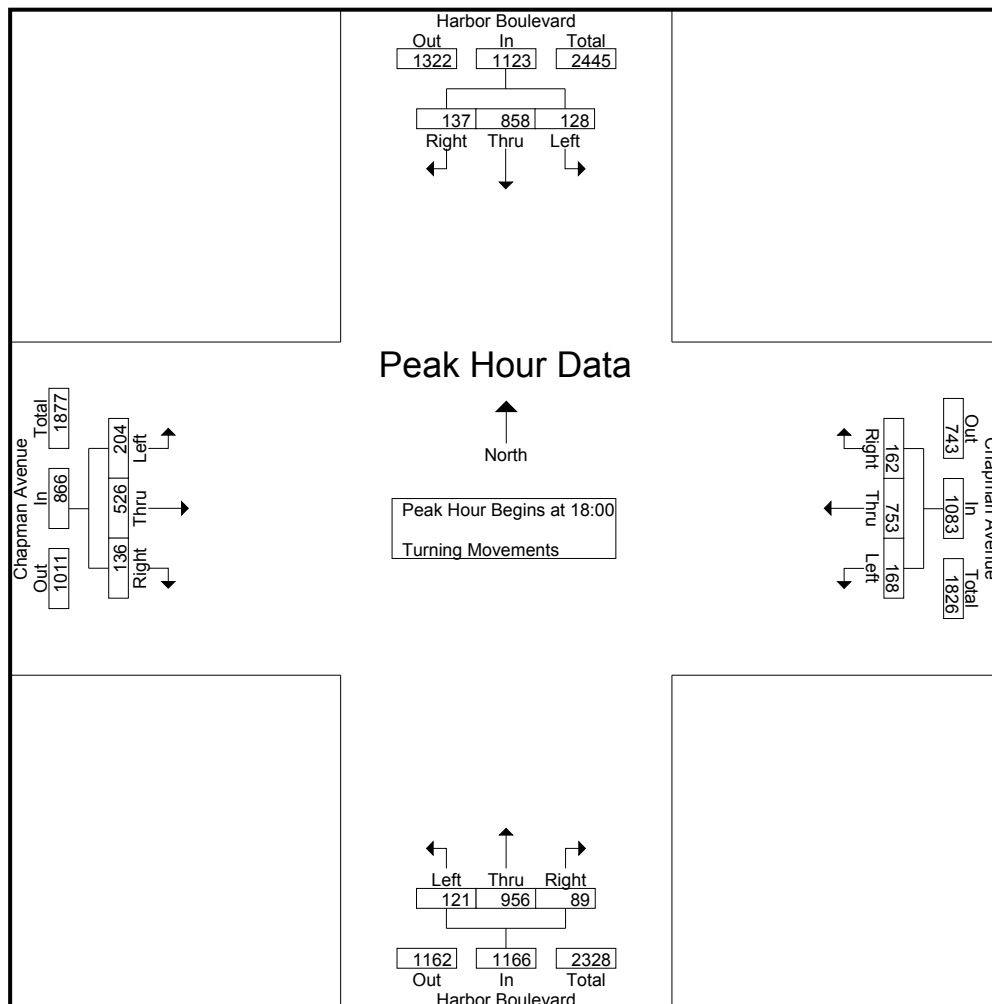
Groups Printed- Turning Movements

	Harbor Boulevard Southbound			Chapman Avenue Westbound			Harbor Boulevard Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	32	215	34	43	220	40	15	247	24	32	145	55	1102
18:15	34	223	33	38	184	50	16	247	33	34	124	61	1077
18:30	29	216	26	41	165	39	35	233	31	37	125	40	1017
18:45	42	204	35	40	184	39	23	229	33	33	132	48	1042
Total	137	858	128	162	753	168	89	956	121	136	526	204	4238
19:00	29	200	40	33	139	44	29	219	38	28	116	39	954
19:15	37	183	34	35	149	46	29	175	28	41	102	40	899
19:30	27	176	21	27	127	40	19	205	26	22	89	30	809
19:45	23	155	30	27	86	25	24	165	27	13	75	39	689
Total	116	714	125	122	501	155	101	764	119	104	382	148	3351
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	21	141	25	18	104	28	22	133	22	17	59	27	617
21:15	18	111	14	27	91	29	26	123	17	15	78	25	574
21:30	28	100	20	19	83	32	24	133	25	15	62	19	560
21:45	21	126	23	21	82	34	22	129	23	16	63	26	586
Total	88	478	82	85	360	123	94	518	87	63	262	97	2337
22:00	23	104	23	30	87	37	29	87	40	17	73	19	569
22:15	17	117	32	19	104	44	23	123	17	17	47	32	592
22:30	16	132	11	16	64	37	17	95	17	16	45	9	475
22:45	9	81	15	13	49	43	16	115	10	20	50	14	435
Total	65	434	81	78	304	161	85	420	84	70	215	74	2071
Grand Total	406	2484	416	447	1918	607	369	2658	411	373	1385	523	11997
Apprch %	12.3	75.1	12.6	15	64.5	20.4	10.7	77.3	12	16.4	60.7	22.9	
Total %	3.4	20.7	3.5	3.7	16	5.1	3.1	22.2	3.4	3.1	11.5	4.4	

CITY: FULLERTON  
N/S: HARBOR BOULEVARD  
E/W: CHAPMAN AVENUE

File Name : H1810067  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

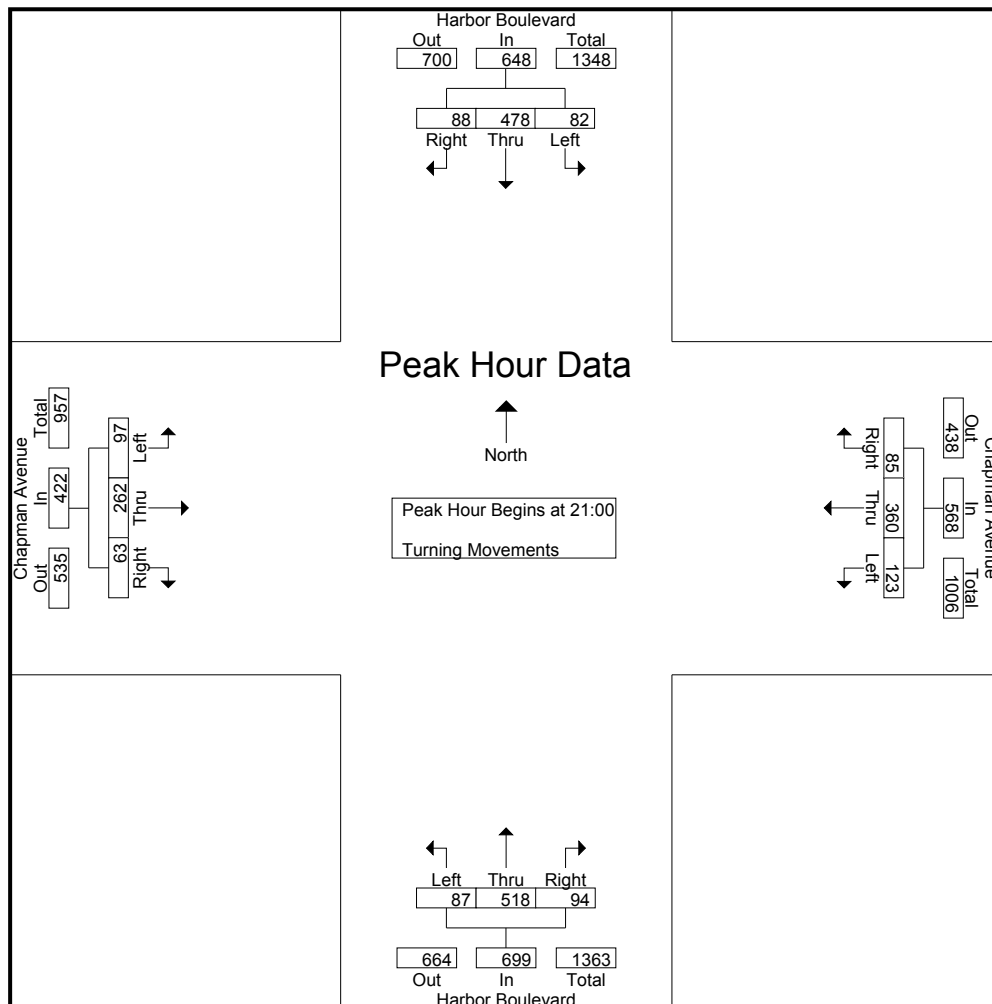
	Harbor Boulevard Southbound				Chapman Avenue Westbound				Harbor Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	32	215	34	281	43	220	40	303	15	247	24	286	32	145	55	232	1102
18:15	34	223	33	290	38	184	50	272	16	247	33	296	34	124	61	219	1077
18:30	29	216	26	271	41	165	39	245	35	233	31	299	37	125	40	202	1017
18:45	42	204	35	281	40	184	39	263	23	229	33	285	33	132	48	213	1042
Total Volume	137	858	128	1123	162	753	168	1083	89	956	121	1166	136	526	204	866	4238
% App. Total	12.2	76.4	11.4		15	69.5	15.5		7.6	82	10.4		15.7	60.7	23.6		
PHF	.815	.962	.914	.968	.942	.856	.840	.894	.636	.968	.917	.975	.919	.907	.836	.933	.961



CITY: FULLERTON  
N/S: HARBOR BOULEVARD  
E/W: CHAPMAN AVENUE

File Name : H1810067  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Harbor Boulevard Southbound				Chapman Avenue Westbound				Harbor Boulevard Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	21	141	25	187	18	104	28	150	22	133	22	177	17	59	27	103	617
21:15	18	111	14	143	27	91	29	147	26	123	17	166	15	78	25	118	574
21:30	28	100	20	148	19	83	32	134	24	133	25	182	15	62	19	96	560
21:45	21	126	23	170	21	82	34	137	22	129	23	174	16	63	26	105	586
Total Volume	88	478	82	648	85	360	123	568	94	518	87	699	63	262	97	422	2337
% App. Total	13.6	73.8	12.7		15	63.4	21.7		13.4	74.1	12.4		14.9	62.1	23		
PHF	.786	.848	.820	.866	.787	.865	.904	.947	.904	.974	.870	.960	.926	.840	.898	.894	.947





cITY: FULLERTON  
N/S: LEMON STREET  
E/W: CHAPMAN AVENUE

File Name : h1810068  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

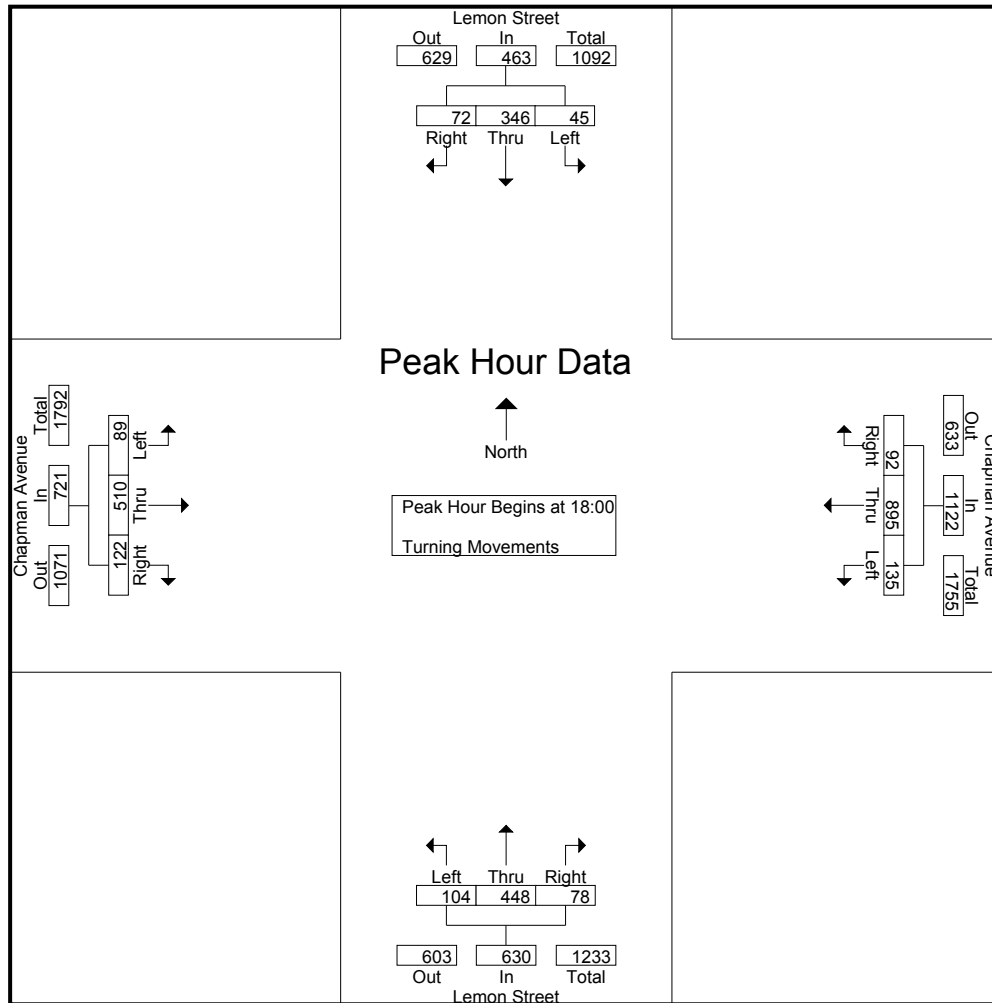
Groups Printed- Turning Movements

	Lemon Street Southbound			Chapman Avenue Westbound			Lemon Street Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	8	83	6	20	253	37	19	128	26	32	139	21	772
18:15	20	86	11	23	221	36	25	120	23	35	123	17	740
18:30	17	96	13	26	210	32	13	100	28	25	128	25	713
18:45	27	81	15	23	211	30	21	100	27	30	120	26	711
Total	72	346	45	92	895	135	78	448	104	122	510	89	2936
19:00	30	81	24	26	170	42	16	75	23	32	139	29	687
19:15	22	52	14	21	169	35	19	71	22	25	110	21	581
19:30	21	46	10	8	150	27	17	64	24	18	114	12	511
19:45	11	34	5	7	108	33	18	64	12	26	92	18	428
Total	84	213	53	62	597	137	70	274	81	101	455	80	2207
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	10	49	7	15	107	26	18	32	19	13	81	13	390
21:15	9	30	8	12	128	16	14	40	14	18	95	15	399
21:30	19	36	14	7	99	14	5	46	10	14	91	14	369
21:45	23	41	13	6	73	16	10	45	23	9	91	17	367
Total	61	156	42	40	407	72	47	163	66	54	358	59	1525
22:00	45	62	39	13	93	18	16	58	20	19	99	11	493
22:15	40	67	35	7	99	13	11	33	20	16	74	20	435
22:30	23	47	19	5	80	12	6	30	8	18	74	8	330
22:45	2	18	5	2	89	15	7	28	10	12	64	5	257
Total	110	194	98	27	361	58	40	149	58	65	311	44	1515
Grand Total	327	909	238	221	2260	402	235	1034	309	342	1634	272	8183
Apprch %	22.2	61.7	16.1	7.7	78.4	13.9	14.9	65.5	19.6	15.2	72.7	12.1	
Total %	4	11.1	2.9	2.7	27.6	4.9	2.9	12.6	3.8	4.2	20	3.3	

cITY: FULLERTON  
N/S: LEMON STREET  
E/W: CHAPMAN AVENUE

File Name : h1810068  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

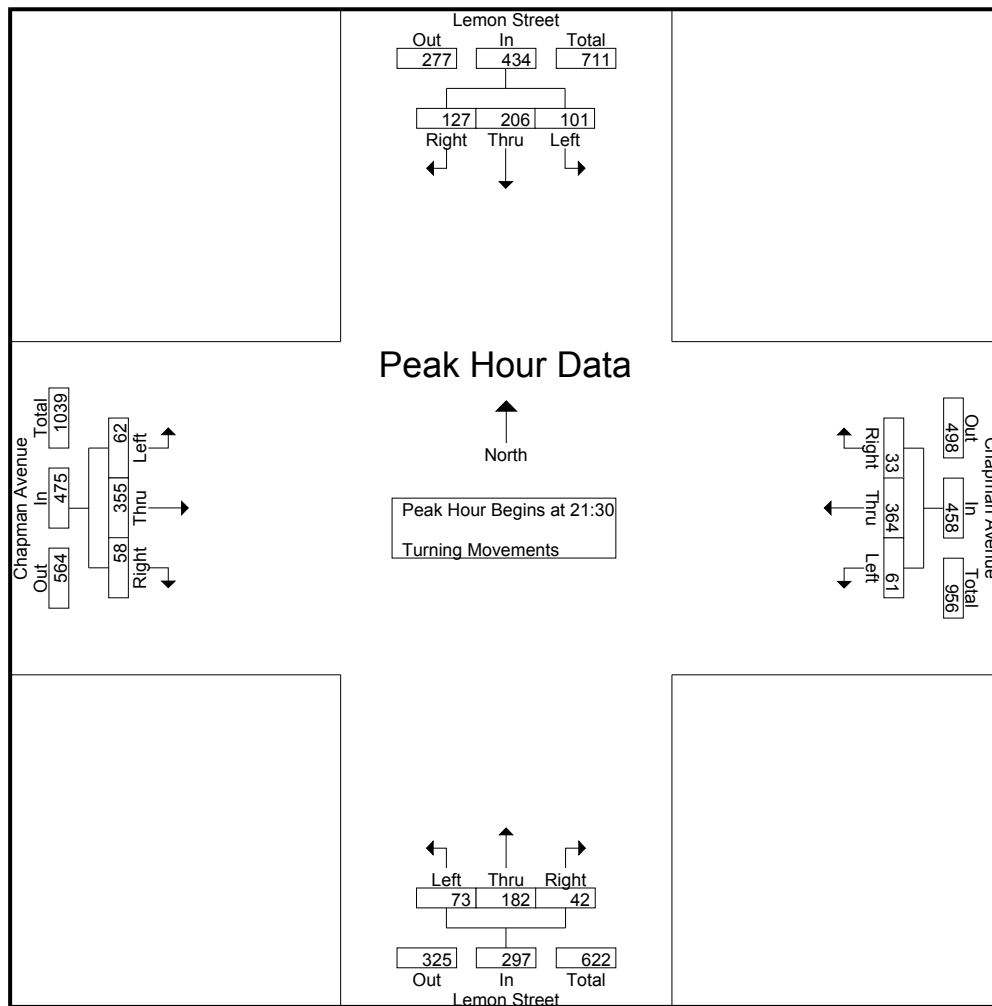
	Lemon Street Southbound				Chapman Avenue Westbound				Lemon Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	8	83	6	97	20	253	37	310	19	128	26	173	32	139	21	192	772
18:15	20	86	11	117	23	221	36	280	25	120	23	168	35	123	17	175	740
18:30	17	96	13	126	26	210	32	268	13	100	28	141	25	128	25	178	713
18:45	27	81	15	123	23	211	30	264	21	100	27	148	30	120	26	176	711
Total Volume	72	346	45	463	92	895	135	1122	78	448	104	630	122	510	89	721	2936
% App. Total	15.6	74.7	9.7		8.2	79.8	12		12.4	71.1	16.5		16.9	70.7	12.3		
PHF	.667	.901	.750	.919	.885	.884	.912	.905	.780	.875	.929	.910	.871	.917	.856	.939	.951



cITY: FULLERTON  
N/S: LEMON STREET  
E/W: CHAPMAN AVENUE

File Name : h1810068  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Lemon Street Southbound				Chapman Avenue Westbound				Lemon Street Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	19	36	14	69	7	99	14	120	5	46	10	61	14	91	14	119	369
21:45	23	41	13	77	6	73	16	95	10	45	23	78	9	91	17	117	367
22:00	45	62	39	146	13	93	18	124	16	58	20	94	19	99	11	129	493
22:15	40	67	35	142	7	99	13	119	11	33	20	64	16	74	20	110	435
Total Volume	127	206	101	434	33	364	61	458	42	182	73	297	58	355	62	475	1664
% App. Total	29.3	47.5	23.3		7.2	79.5	13.3		14.1	61.3	24.6		12.2	74.7	13.1		
PHF	.706	.769	.647	.743	.635	.919	.847	.923	.656	.784	.793	.790	.763	.896	.775	.921	.844



CITY: FULLERTON  
M/S: BERKELEY AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810069  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

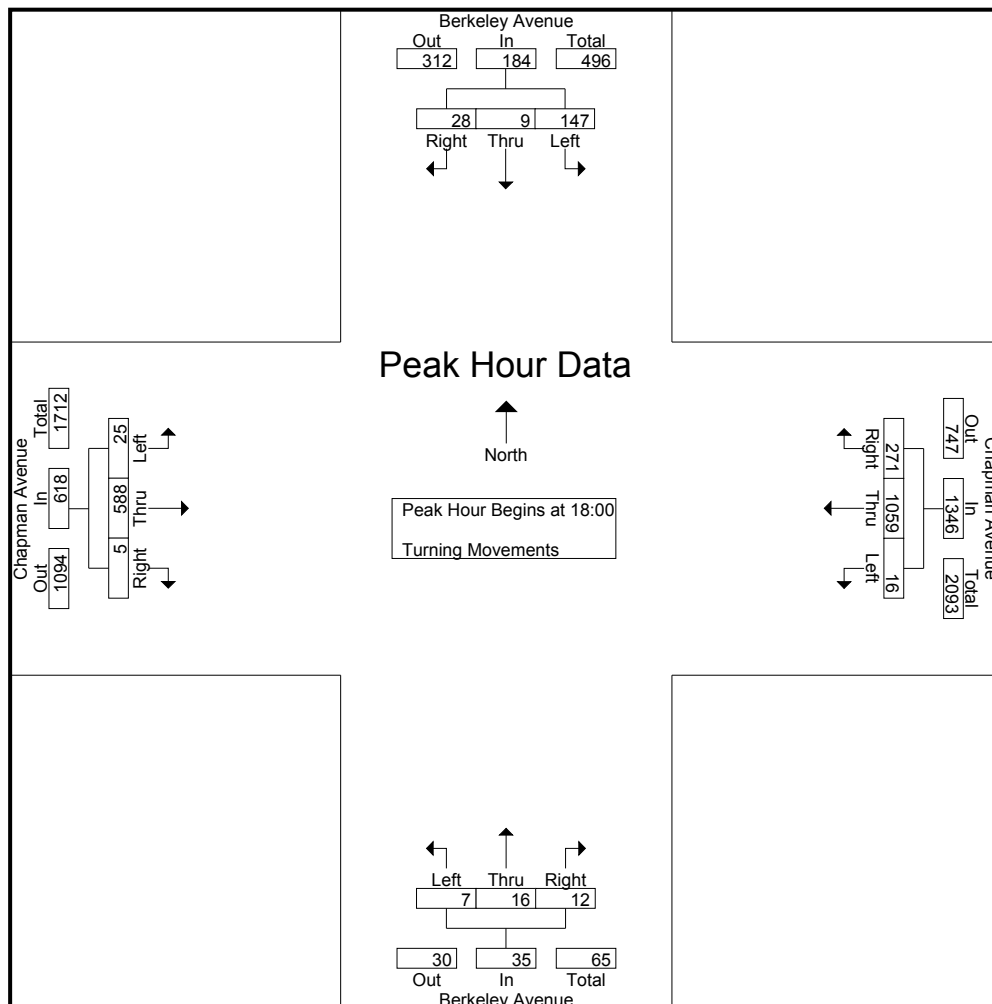
Groups Printed- Turning Movements

	Berkeley Avenue Southbound			Chapman Avenue Westbound			Berkeley Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	9	1	52	83	276	6	3	6	1	1	155	6	599
18:15	6	2	31	64	273	3	3	5	1	1	150	12	551
18:30	9	4	34	57	254	2	3	4	3	0	143	5	518
18:45	4	2	30	67	256	5	3	1	2	3	140	2	515
Total	28	9	147	271	1059	16	12	16	7	5	588	25	2183
19:00	9	4	35	37	232	5	2	1	1	4	164	2	496
19:15	8	0	21	29	211	4	2	1	3	4	131	2	416
19:30	5	0	25	35	183	4	3	2	1	3	132	5	398
19:45	8	4	21	34	131	1	1	0	1	3	108	4	316
Total	30	8	102	135	757	14	8	4	6	14	535	13	1626
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	4	5	16	18	130	4	4	2	0	2	98	3	286
21:15	10	0	17	28	154	5	3	5	2	2	120	3	349
21:30	6	3	15	31	105	5	2	1	1	1	96	5	271
21:45	2	3	25	16	99	4	5	2	1	2	111	2	272
Total	22	11	73	93	488	18	14	10	4	7	425	13	1178
22:00	5	4	39	27	116	5	2	1	2	3	140	3	347
22:15	5	0	17	25	110	0	1	1	0	3	126	1	289
22:30	6	0	26	19	101	1	0	1	1	3	95	5	258
22:45	2	1	12	16	90	1	2	1	2	7	73	3	210
Total	18	5	94	87	417	7	5	4	5	16	434	12	1104
Grand Total	98	33	416	586	2721	55	39	34	22	42	1982	63	6091
Apprch %	17.9	6	76.1	17.4	80.9	1.6	41.1	35.8	23.2	2	95	3	
Total %	1.6	0.5	6.8	9.6	44.7	0.9	0.6	0.6	0.4	0.7	32.5	1	

CITY: FULLERTON  
M/S: BERKELEY AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810069  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

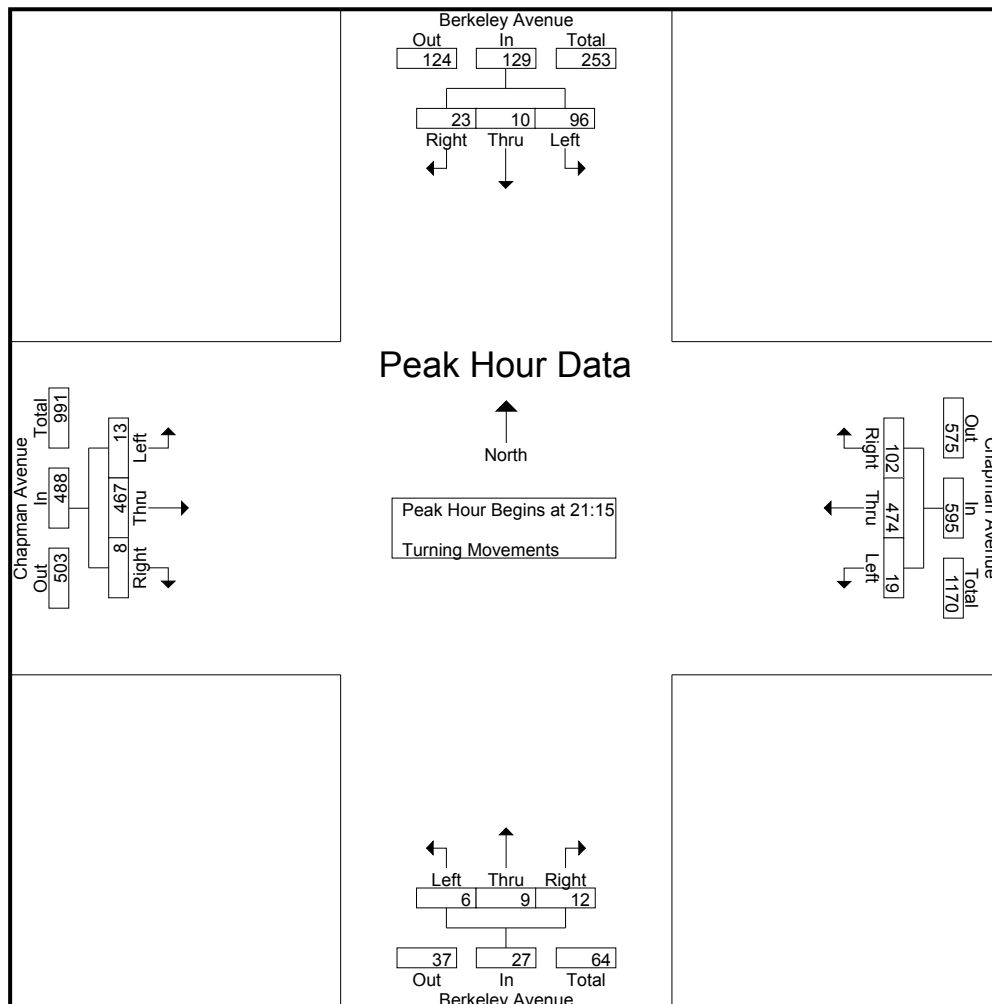
	Berkeley Avenue Southbound				Chapman Avenue Westbound				Berkeley Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	9	1	52	62	83	276	6	365	3	6	1	10	1	155	6	162	599
18:15	6	2	31	39	64	273	3	340	3	5	1	9	1	150	12	163	551
18:30	9	4	34	47	57	254	2	313	3	4	3	10	0	143	5	148	518
18:45	4	2	30	36	67	256	5	328	3	1	2	6	3	140	2	145	515
Total Volume	28	9	147	184	271	1059	16	1346	12	16	7	35	5	588	25	618	2183
% App. Total	15.2	4.9	79.9		20.1	78.7	1.2		34.3	45.7	20		0.8	95.1	4		
PHF	.778	.563	.707	.742	.816	.959	.667	.922	1.00	.667	.583	.875	.417	.948	.521	.948	.911



CITY: FULLERTON  
M/S: BERKELEY AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810069  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Berkeley Avenue Southbound				Chapman Avenue Westbound				Berkeley Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	10	0	17	27	28	154	5	187	3	5	2	10	2	120	3	125	349
21:30	6	3	15	24	31	105	5	141	2	1	1	4	1	96	5	102	271
21:45	2	3	25	30	16	99	4	119	5	2	1	8	2	111	2	115	272
22:00	5	4	39	48	27	116	5	148	2	1	2	5	3	140	3	146	347
Total Volume	23	10	96	129	102	474	19	595	12	9	6	27	8	467	13	488	1239
% App. Total	17.8	7.8	74.4		17.1	79.7	3.2		44.4	33.3	22.2		1.6	95.7	2.7		
PHF	.575	.625	.615	.672	.823	.769	.950	.795	.600	.450	.750	.675	.667	.834	.650	.836	.888



CITY: FULLERTON  
N/S: RAYMOND AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810070  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

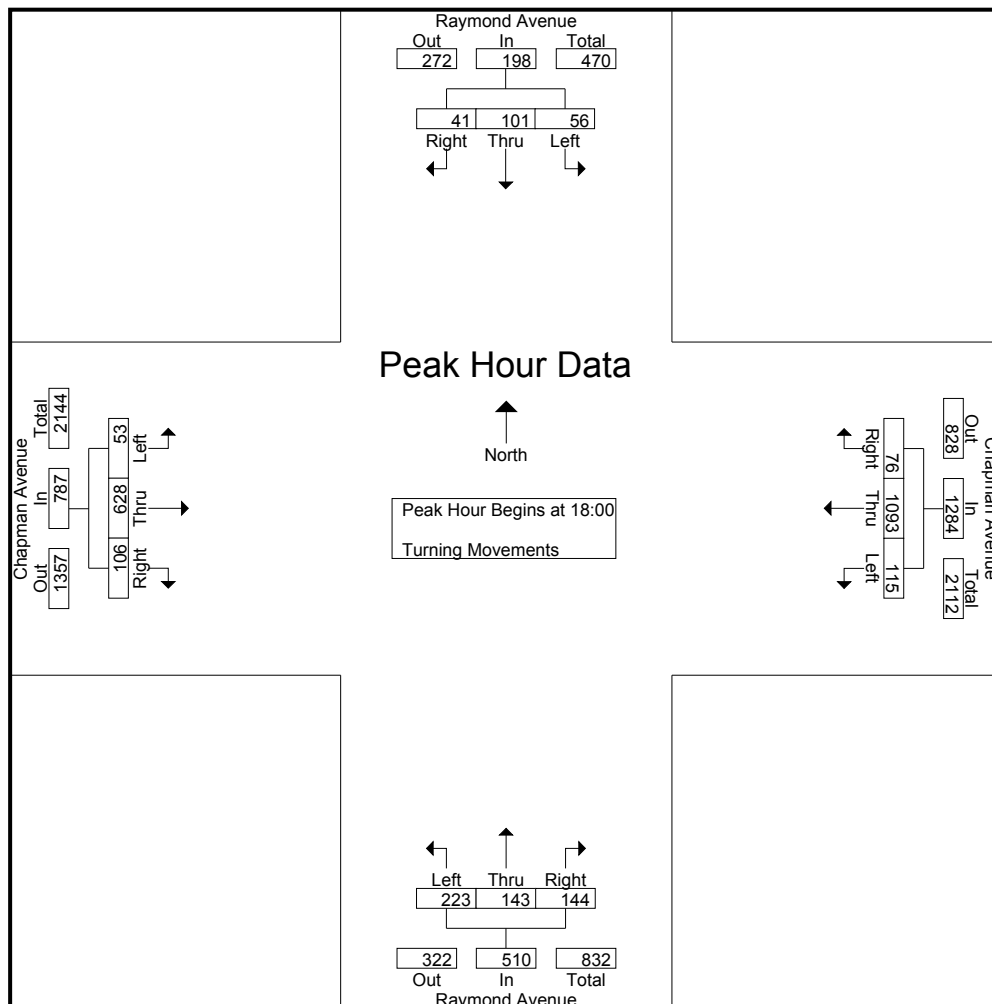
Groups Printed- Turning Movements

	Raymond Avenue Southbound			Chapman Avenue Westbound			Raymond Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	16	27	13	21	279	32	38	33	70	34	168	15	746
18:15	4	27	16	20	285	35	49	49	63	22	161	13	744
18:30	13	28	13	16	248	24	32	36	45	22	150	14	641
18:45	8	19	14	19	281	24	25	25	45	28	149	11	648
Total	41	101	56	76	1093	115	144	143	223	106	628	53	2779
19:00	8	22	12	17	246	21	28	27	27	19	177	7	611
19:15	9	19	13	3	207	39	31	29	30	20	130	10	540
19:30	4	18	10	8	179	24	19	21	27	21	139	7	477
19:45	6	15	11	11	149	9	25	24	24	17	121	9	421
Total	27	74	46	39	781	93	103	101	108	77	567	33	2049
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	6	12	10	10	144	18	29	13	17	12	106	7	384
21:15	7	4	11	8	157	21	15	16	17	10	111	8	385
21:30	1	9	3	7	128	18	13	18	21	10	106	5	339
21:45	4	9	8	8	108	19	24	7	10	21	115	6	339
Total	18	34	32	33	537	76	81	54	65	53	438	26	1447
22:00	12	14	6	6	123	18	14	8	17	19	151	16	404
22:15	4	5	4	6	112	14	19	13	17	10	128	7	339
22:30	8	10	6	8	110	10	19	17	9	15	103	8	323
22:45	5	8	6	3	96	22	8	13	11	7	76	5	260
Total	29	37	22	23	441	64	60	51	54	51	458	36	1326
Grand Total	115	246	156	171	2852	348	388	349	450	287	2091	148	7601
Apprch %	22.2	47.6	30.2	5.1	84.6	10.3	32.7	29.4	37.9	11.4	82.8	5.9	
Total %	1.5	3.2	2.1	2.2	37.5	4.6	5.1	4.6	5.9	3.8	27.5	1.9	

CITY: FULLERTON  
N/S: RAYMOND AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810070  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

	Raymond Avenue Southbound				Chapman Avenue Westbound				Raymond Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	16	27	13	56	21	279	32	332	38	33	70	141	34	168	15	217	746
18:15	4	27	16	47	20	285	35	340	49	49	63	161	22	161	13	196	744
18:30	13	28	13	54	16	248	24	288	32	36	45	113	22	150	14	186	641
18:45	8	19	14	41	19	281	24	324	25	25	45	95	28	149	11	188	648
Total Volume	41	101	56	198	76	1093	115	1284	144	143	223	510	106	628	53	787	2779
% App. Total	20.7	51	28.3		5.9	85.1	9		28.2	28	43.7		13.5	79.8	6.7		
PHF	.641	.902	.875	.884	.905	.959	.821	.944	.735	.730	.796	.792	.779	.935	.883	.907	.931

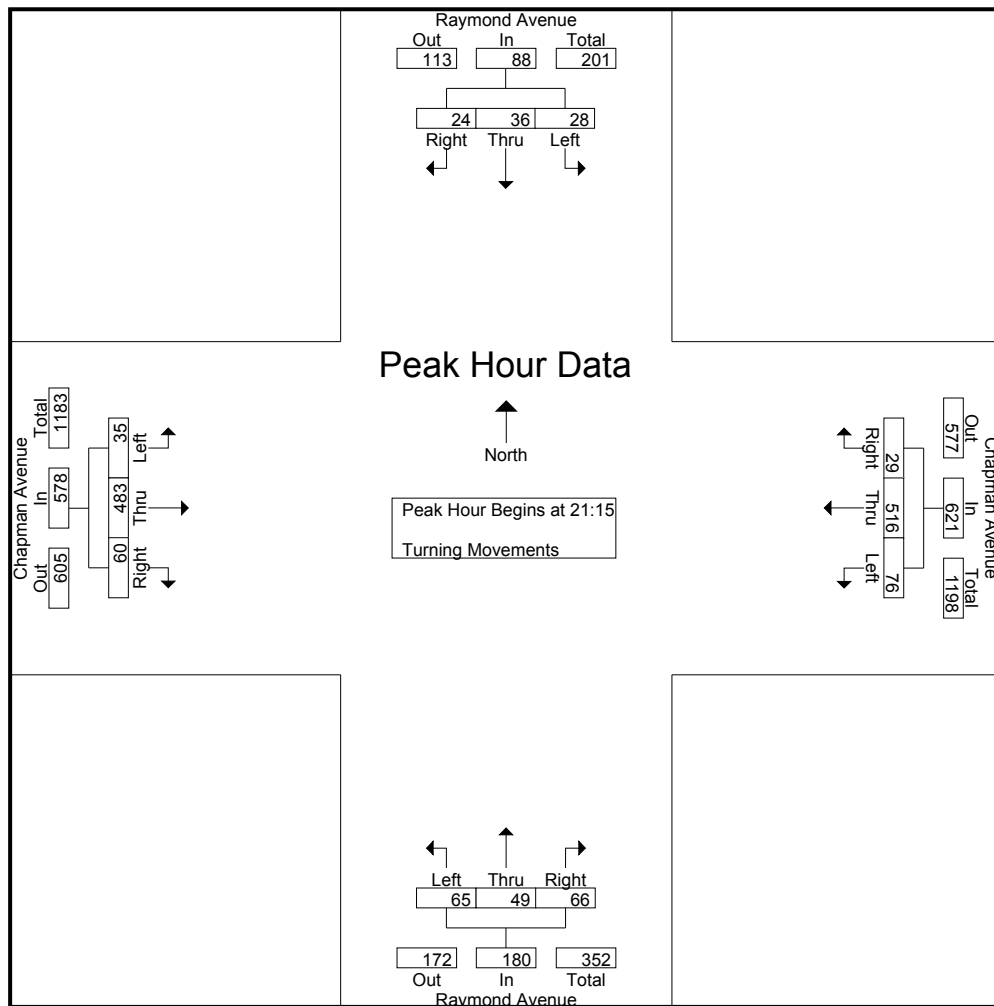




CITY: FULLERTON  
N/S: RAYMOND AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810070  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Raymond Avenue Southbound				Chapman Avenue Westbound				Raymond Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	7	4	11	22	8	157	21	186	15	16	17	48	10	111	8	129	385
21:30	1	9	3	13	7	128	18	153	13	18	21	52	10	106	5	121	339
21:45	4	9	8	21	8	108	19	135	24	7	10	41	21	115	6	142	339
22:00	12	14	6	32	6	123	18	147	14	8	17	39	19	151	16	186	404
Total Volume	24	36	28	88	29	516	76	621	66	49	65	180	60	483	35	578	1467
% App. Total	27.3	40.9	31.8		4.7	83.1	12.2		36.7	27.2	36.1		10.4	83.6	6.1		
PHF	.500	.643	.636	.688	.906	.822	.905	.835	.688	.681	.774	.865	.714	.800	.547	.777	.908



CITY: FULERTON  
N/S: ACACIA AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810071  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

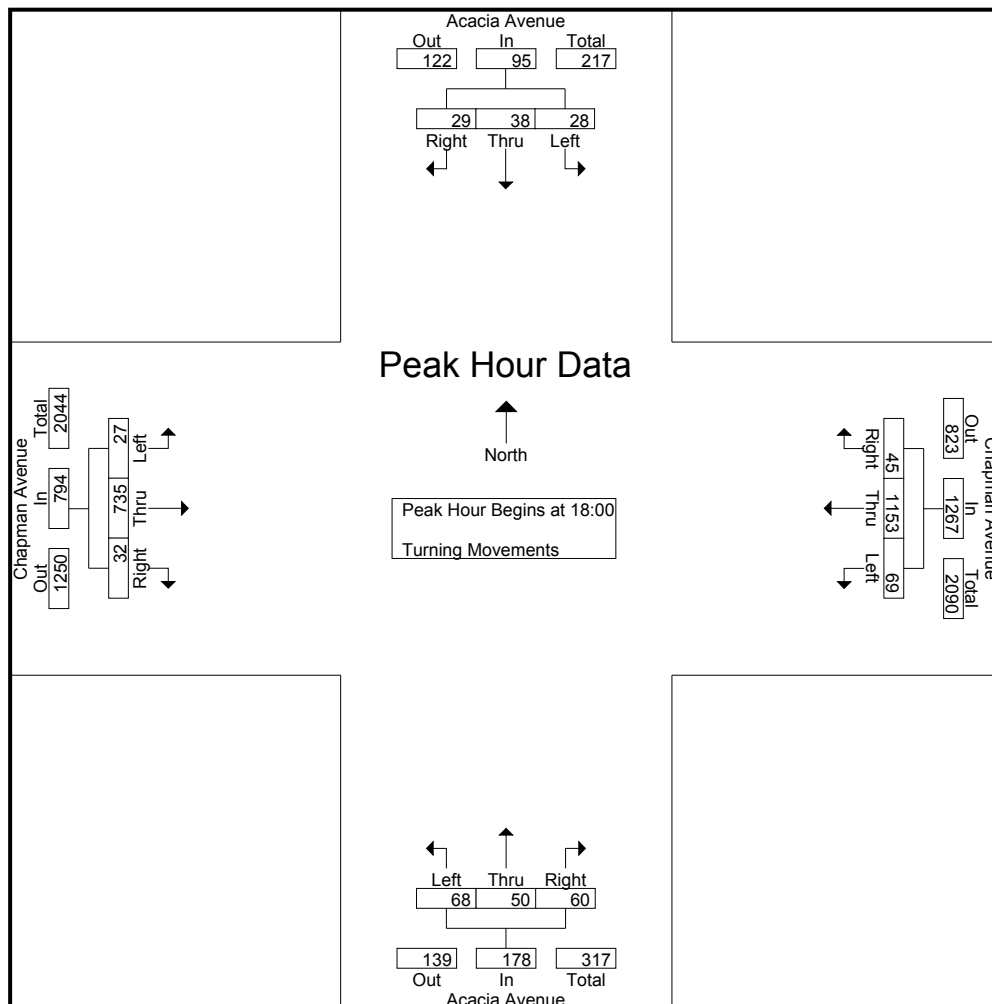
Groups Printed- Turning Movements

	Acacia Avenue Southbound			Chapman Avenue Westbound			Acacia Avenue Northbound			Chapman Avenue Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	10	10	9	13	302	21	16	18	24	4	187	8	622
18:15	4	11	6	13	297	14	19	17	12	13	197	12	615
18:30	5	11	9	8	268	21	10	9	14	10	175	5	545
18:45	10	6	4	11	286	13	15	6	18	5	176	2	552
Total	29	38	28	45	1153	69	60	50	68	32	735	27	2334
19:00	6	2	11	6	242	12	4	6	9	7	186	7	498
19:15	11	6	10	11	216	14	10	6	4	8	156	10	462
19:30	7	11	2	10	210	7	10	3	8	12	146	2	428
19:45	5	6	6	5	171	12	15	5	9	10	145	2	391
Total	29	25	29	32	839	45	39	20	30	37	633	21	1779
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	6	4	5	7	158	11	9	3	4	7	119	1	334
21:15	4	6	7	5	167	10	7	5	5	5	119	3	343
21:30	5	4	4	6	135	9	5	2	2	5	106	3	286
21:45	5	5	6	5	112	8	7	4	4	4	122	8	290
Total	20	19	22	23	572	38	28	14	15	21	466	15	1253
22:00	3	2	11	6	135	11	5	7	8	6	149	6	349
22:15	9	5	4	1	111	4	7	7	7	8	132	4	299
22:30	1	3	1	9	123	7	5	4	7	4	103	6	273
22:45	2	3	1	1	110	2	2	5	0	4	80	2	212
Total	15	13	17	17	479	24	19	23	22	22	464	18	1133
Grand Total	93	95	96	117	3043	176	146	107	135	112	2298	81	6499
Apprch %	32.7	33.5	33.8	3.5	91.2	5.3	37.6	27.6	34.8	4.5	92.3	3.3	
Total %	1.4	1.5	1.5	1.8	46.8	2.7	2.2	1.6	2.1	1.7	35.4	1.2	

CITY: FULERTON  
N/S: ACACIA AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810071  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

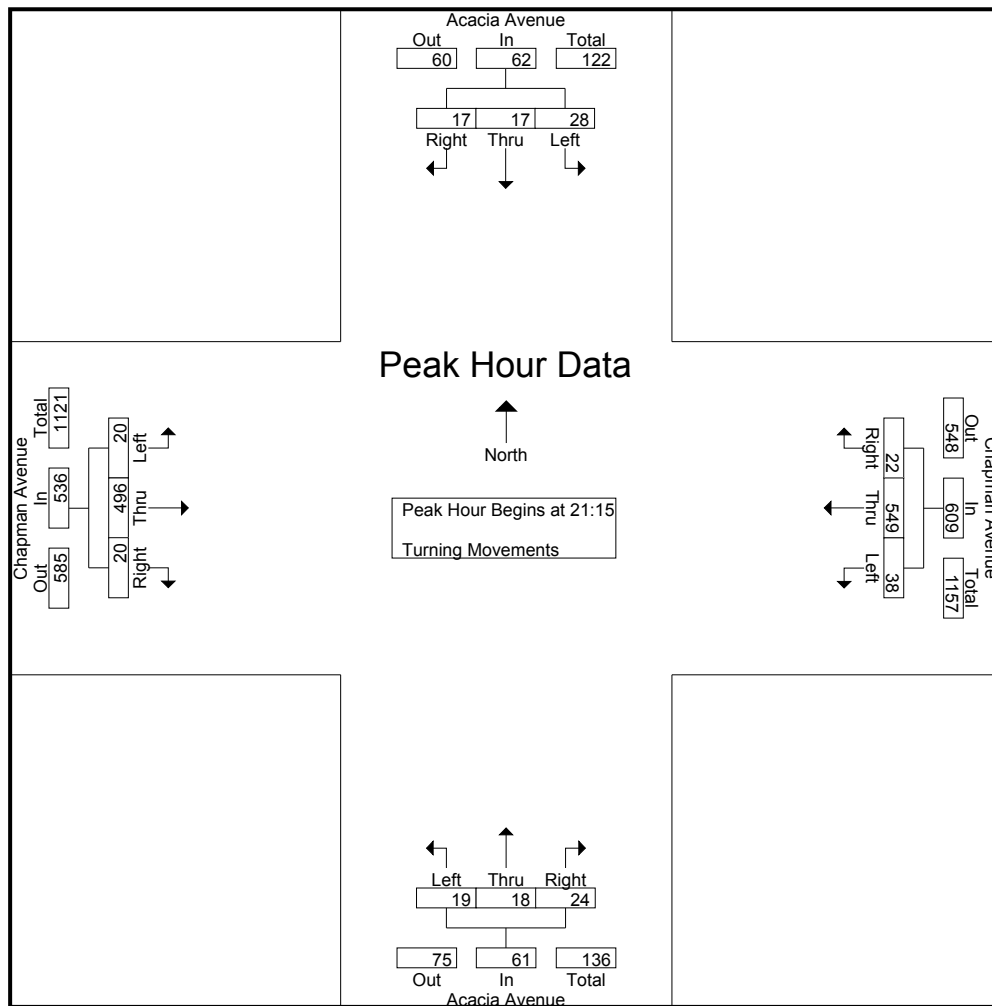
	Acacia Avenue Southbound				Chapman Avenue Westbound				Acacia Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	10	10	9	29	13	302	21	336	16	18	24	58	4	187	8	199	622
18:15	4	11	6	21	13	297	14	324	19	17	12	48	13	197	12	222	615
18:30	5	11	9	25	8	268	21	297	10	9	14	33	10	175	5	190	545
18:45	10	6	4	20	11	286	13	310	15	6	18	39	5	176	2	183	552
Total Volume	29	38	28	95	45	1153	69	1267	60	50	68	178	32	735	27	794	2334
% App. Total	30.5	40	29.5		3.6	91	5.4		33.7	28.1	38.2		4	92.6	3.4		
PHF	.725	.864	.778	.819	.865	.954	.821	.943	.789	.694	.708	.767	.615	.933	.563	.894	.938



CITY: FULERTON  
N/S: ACACIA AVENUE  
E/W: CHAPMAN AVENUE

File Name : H1810071  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Acacia Avenue Southbound				Chapman Avenue Westbound				Acacia Avenue Northbound				Chapman Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	4	6	7	17	5	167	10	182	7	5	5	17	5	119	3	127	343
21:30	5	4	4	13	6	135	9	150	5	2	2	9	5	106	3	114	286
21:45	5	5	6	16	5	112	8	125	7	4	4	15	4	122	8	134	290
22:00	3	2	11	16	6	135	11	152	5	7	8	20	6	149	6	161	349
Total Volume	17	17	28	62	22	549	38	609	24	18	19	61	20	496	20	536	1268
% App. Total	27.4	27.4	45.2		3.6	90.1	6.2		39.3	29.5	31.1		3.7	92.5	3.7		
PHF	.850	.708	.636	.912	.917	.822	.864	.837	.857	.643	.594	.763	.833	.832	.625	.832	.908



City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1810072  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

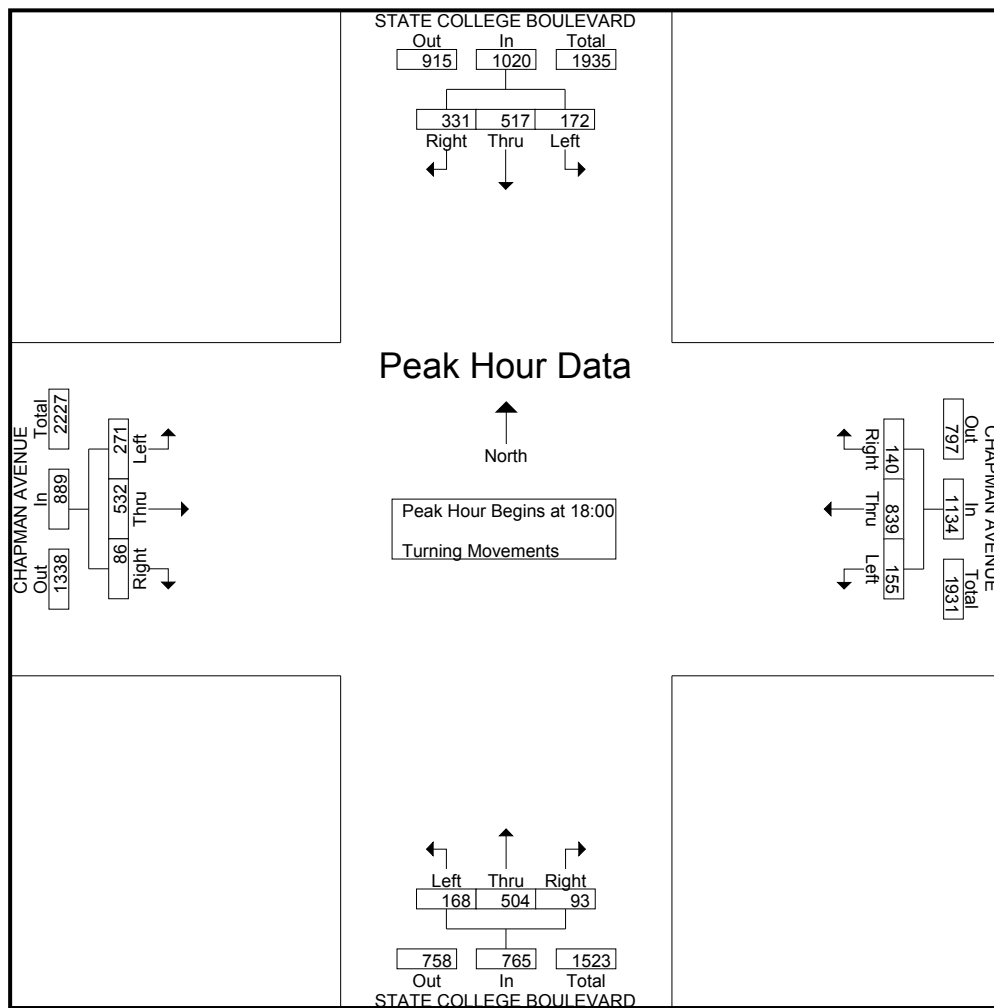
Groups Printed- Turning Movements

	STATE COLLEGE BOULEVARD Southbound			CHAPMAN AVENUE Westbound			STATE COLLEGE BOULEVARD Northbound			CHAPMAN AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	100	134	48	40	233	46	19	134	37	20	140	82	1033
18:15	79	116	37	38	196	32	22	141	44	25	131	57	918
18:30	75	131	43	30	217	37	26	130	41	23	124	61	938
18:45	77	136	44	32	193	40	26	99	46	18	137	71	919
Total	331	517	172	140	839	155	93	504	168	86	532	271	3808
19:00	71	102	32	51	202	41	17	89	19	26	127	58	835
19:15	58	95	28	20	170	45	25	88	24	13	110	52	728
19:30	62	81	41	33	135	37	25	89	28	19	109	40	699
19:45	58	66	35	34	142	37	25	75	27	18	104	52	673
Total	249	344	136	138	649	160	92	341	98	76	450	202	2935
*** BREAK ***													
21:00	44	76	29	34	125	28	24	59	23	14	93	48	597
21:15	49	77	27	31	119	22	26	58	24	12	100	27	572
21:30	41	73	20	32	101	24	13	43	22	15	89	30	503
21:45	38	52	23	23	90	25	19	83	12	17	84	38	504
Total	172	278	99	120	435	99	82	243	81	58	366	143	2176
22:00	41	52	24	22	106	25	15	48	22	10	130	36	531
22:15	49	61	22	20	76	19	22	47	9	8	98	42	473
22:30	49	65	22	21	84	12	18	52	11	9	71	28	442
22:45	41	44	12	14	62	17	21	51	18	10	59	16	365
Total	180	222	80	77	328	73	76	198	60	37	358	122	1811
Grand Total	932	1361	487	475	2251	487	343	1286	407	257	1706	738	10730
Apprch %	33.5	49	17.5	14.8	70.1	15.2	16.8	63.2	20	9.5	63.2	27.3	
Total %	8.7	12.7	4.5	4.4	21	4.5	3.2	12	3.8	2.4	15.9	6.9	

City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1810072  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

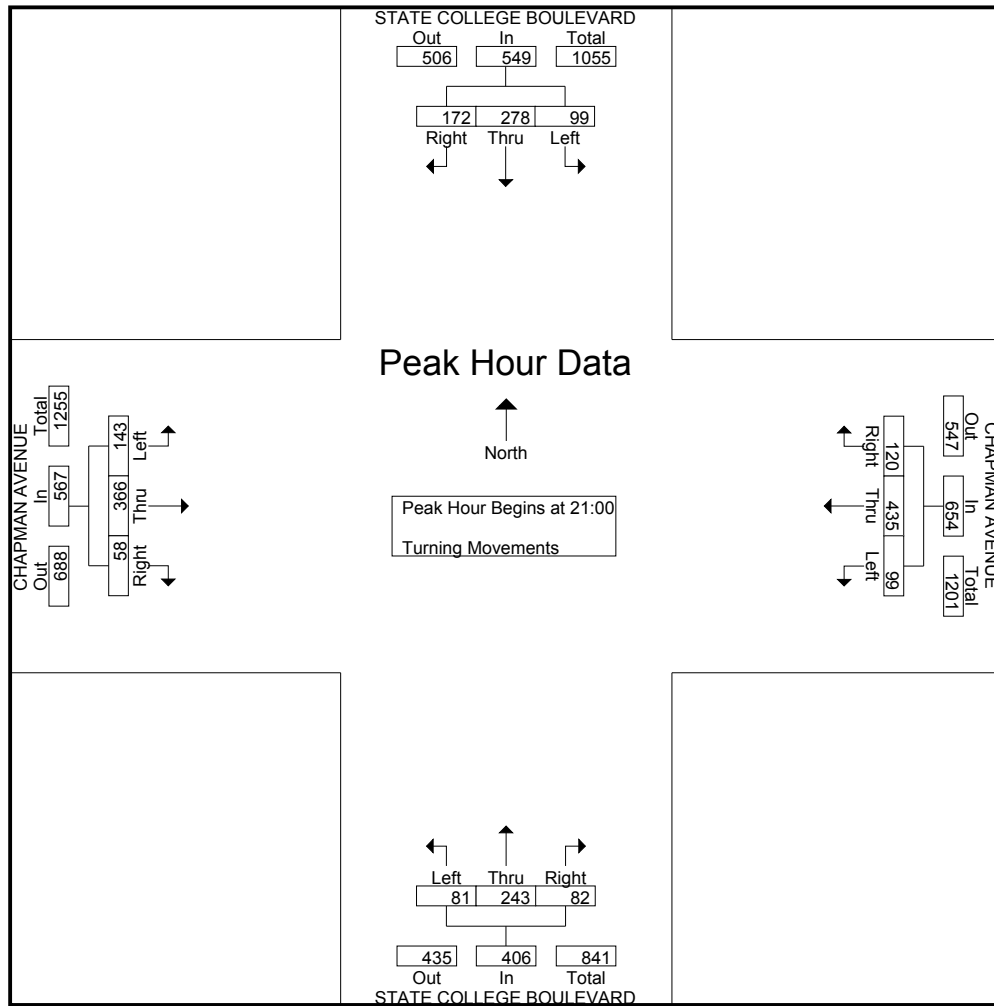
	STATE COLLEGE BOULEVARD Southbound				CHAPMAN AVENUE Westbound				STATE COLLEGE BOULEVARD Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	100	134	48	282	40	233	46	319	19	134	37	190	20	140	82	242	1033
18:15	79	116	37	232	38	196	32	266	22	141	44	207	25	131	57	213	918
18:30	75	131	43	249	30	217	37	284	26	130	41	197	23	124	61	208	938
18:45	77	136	44	257	32	193	40	265	26	99	46	171	18	137	71	226	919
Total Volume	331	517	172	1020	140	839	155	1134	93	504	168	765	86	532	271	889	3808
% App. Total	32.5	50.7	16.9		12.3	74	13.7		12.2	65.9	22		9.7	59.8	30.5		
PHF	.828	.950	.896	.904	.875	.900	.842	.889	.894	.894	.913	.924	.860	.950	.826	.918	.922



City: FULLERTON  
N-S Direction: STATE COLLEGE BOULEVARD  
E-W Direction: CHAPMAN AVENUE

File Name : H1810072  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	STATE COLLEGE BOULEVARD Southbound				CHAPMAN AVENUE Westbound				STATE COLLEGE BOULEVARD Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	44	76	29	149	34	125	28	187	24	59	23	106	14	93	48	155	597
21:15	49	77	27	153	31	119	22	172	26	58	24	108	12	100	27	139	572
21:30	41	73	20	134	32	101	24	157	13	43	22	78	15	89	30	134	503
21:45	38	52	23	113	23	90	25	138	19	83	12	114	17	84	38	139	504
Total Volume	172	278	99	549	120	435	99	654	82	243	81	406	58	366	143	567	2176
% App. Total	31.3	50.6	18		18.3	66.5	15.1		20.2	59.9	20		10.2	64.6	25.2		
PHF	.878	.903	.853	.897	.882	.870	.884	.874	.788	.732	.844	.890	.853	.915	.745	.915	.911



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810073  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

Groups Printed- Turning Movements

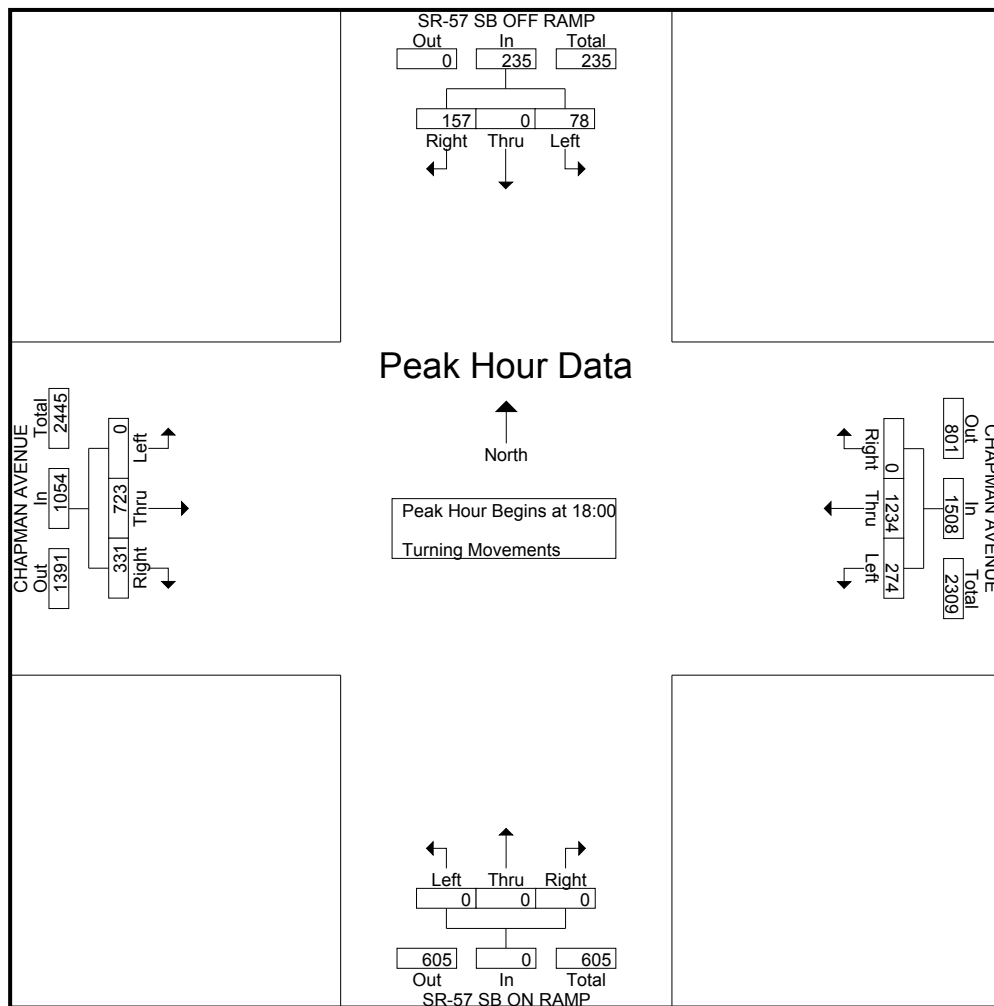
	SR-57 SB OFF RAMP Southbound			CHAPMAN AVENUE Westbound			SR-57 SB ON RAMP Northbound			CHAPMAN AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	45	0	22	0	346	66	0	0	0	82	189	0	750
18:15	25	0	26	0	293	76	0	0	0	93	158	0	671
18:30	42	0	14	0	314	69	0	0	0	88	181	0	708
18:45	45	0	16	0	281	63	0	0	0	68	195	0	668
Total	157	0	78	0	1234	274	0	0	0	331	723	0	2797
19:00	36	0	26	0	293	87	0	0	0	94	163	0	699
19:15	53	0	30	0	246	89	0	0	0	66	140	0	624
19:30	27	0	15	0	234	68	0	0	0	79	136	0	559
19:45	22	0	18	0	208	65	0	0	0	79	151	0	543
Total	138	0	89	0	981	309	0	0	0	318	590	0	2425
*** BREAK ***													
21:00	30	0	23	0	157	61	0	0	0	83	115	0	469
21:15	33	0	11	0	175	55	0	0	0	85	159	0	518
21:30	21	0	16	0	165	49	0	0	0	62	116	0	429
21:45	28	0	14	0	150	48	0	0	0	67	117	0	424
Total	112	0	64	0	647	213	0	0	0	297	507	0	1840
22:00	16	0	21	0	140	57	0	0	0	84	128	0	446
22:15	22	0	7	0	144	51	0	0	0	77	118	0	419
22:30	29	0	12	0	140	36	0	0	0	63	88	0	368
22:45	10	0	10	0	101	36	0	0	0	76	79	0	312
Total	77	0	50	0	525	180	0	0	0	300	413	0	1545
Grand Total	484	0	281	0	3387	976	0	0	0	1246	2233	0	8607
Apprch %	63.3	0	36.7	0	77.6	22.4	0	0	0	35.8	64.2	0	
Total %	5.6	0	3.3	0	39.4	11.3	0	0	0	14.5	25.9	0	



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810073  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

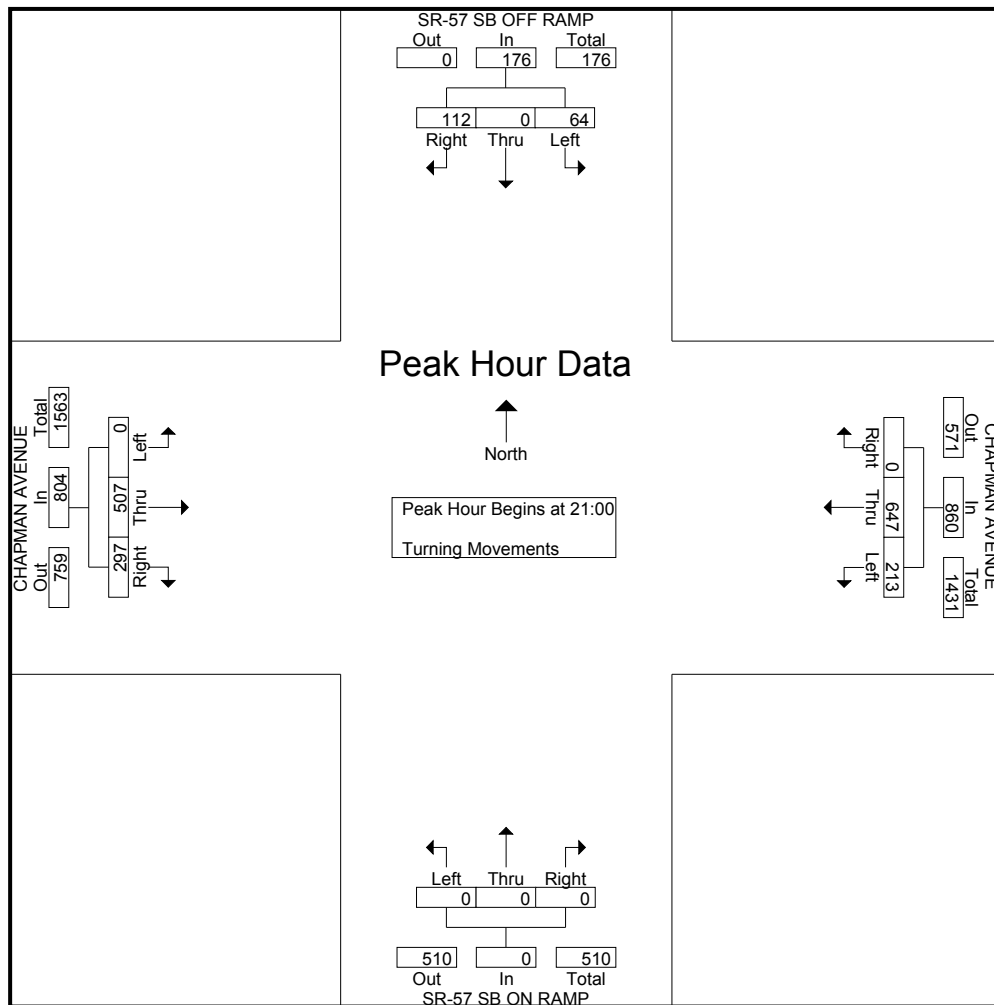
	SR-57 SB OFF RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 SB ON RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	45	0	22	67	0	346	66	412	0	0	0	0	82	189	0	271	750
18:15	25	0	26	51	0	293	76	369	0	0	0	0	93	158	0	251	671
18:30	42	0	14	56	0	314	69	383	0	0	0	0	88	181	0	269	708
18:45	45	0	16	61	0	281	63	344	0	0	0	0	68	195	0	263	668
Total Volume	157	0	78	235	0	1234	274	1508	0	0	0	0	331	723	0	1054	2797
% App. Total	66.8	0	33.2		0	81.8	18.2		0	0	0		31.4	68.6	0		
PHF	.872	.000	.750	.877	.000	.892	.901	.915	.000	.000	.000	.000	.890	.927	.000	.972	.932



City: FULLERTON  
N-S Direction: SR-57 SB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810073  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	SR-57 SB OFF RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 SB ON RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	30	0	23	53	0	157	61	218	0	0	0	0	83	115	0	198	469
21:15	33	0	11	44	0	175	55	230	0	0	0	0	85	159	0	244	518
21:30	21	0	16	37	0	165	49	214	0	0	0	0	62	116	0	178	429
21:45	28	0	14	42	0	150	48	198	0	0	0	0	67	117	0	184	424
Total Volume	112	0	64	176	0	647	213	860	0	0	0	0	297	507	0	804	1840
% App. Total	63.6	0	36.4		0	75.2	24.8		0	0	0		36.9	63.1	0		
PHF	.848	.000	.696	.830	.000	.924	.873	.935	.000	.000	.000	.000	.874	.797	.000	.824	.888



City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810074  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

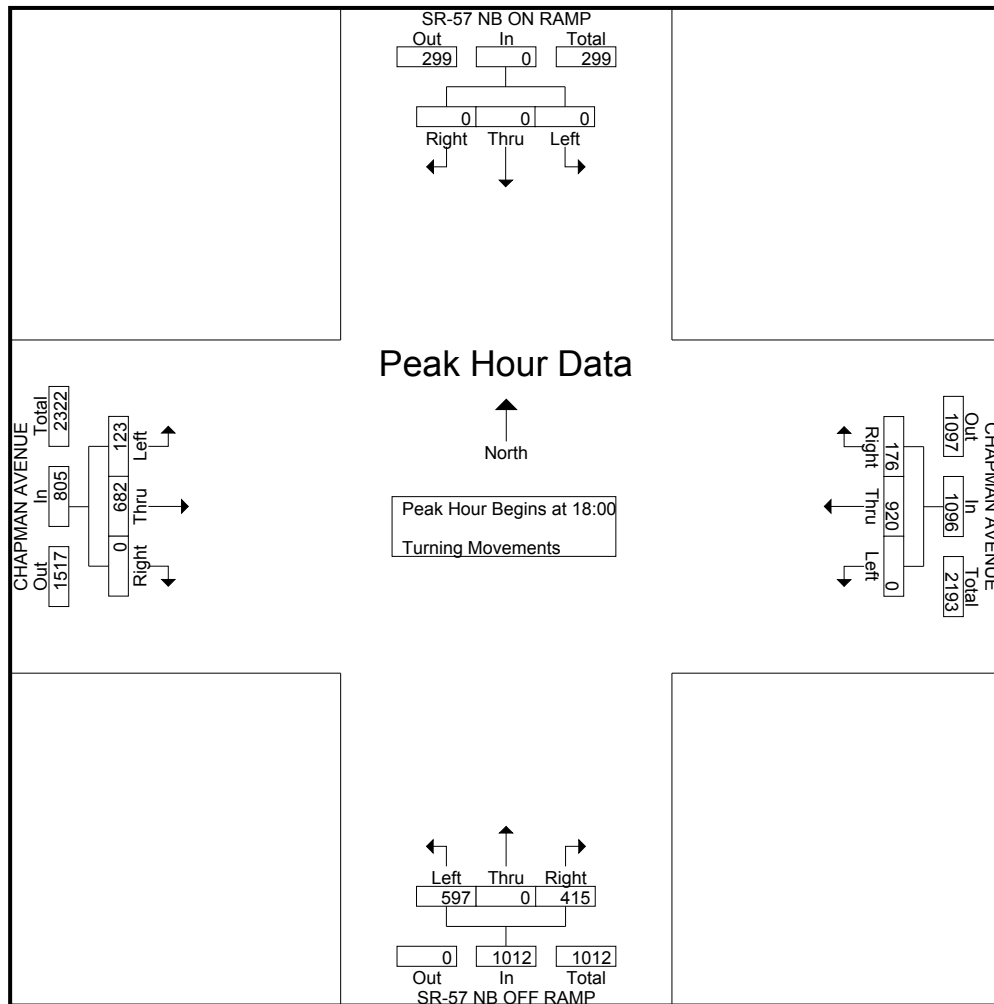
Groups Printed- Turning Movements

Start Time	SR-57 NB ON RAMP Southbound			CHAPMAN AVENUE Westbound			SR-57 NB OFF RAMP Northbound			CHAPMAN AVENUE Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	0	0	0	44	234	0	116	0	166	0	178	28	766
18:15	0	0	0	41	238	0	95	0	129	0	154	33	690
18:30	0	0	0	42	229	0	83	0	160	0	175	27	716
18:45	0	0	0	49	219	0	121	0	142	0	175	35	741
Total	0	0	0	176	920	0	415	0	597	0	682	123	2913
19:00	0	0	0	39	213	0	90	0	165	0	156	25	688
19:15	0	0	0	46	202	0	108	0	131	0	137	28	652
19:30	0	0	0	36	189	0	98	0	128	0	132	27	610
19:45	0	0	0	32	153	0	81	0	117	0	127	34	544
Total	0	0	0	153	757	0	377	0	541	0	552	114	2494
*** BREAK ***													
21:00	0	0	0	30	130	0	74	0	84	0	104	28	450
21:15	0	0	0	20	125	0	70	0	99	0	132	42	488
21:30	0	0	0	30	129	0	94	0	82	0	110	22	467
21:45	0	0	0	30	122	0	59	0	94	0	94	37	436
Total	0	0	0	110	506	0	297	0	359	0	440	129	1841
22:00	0	0	0	29	107	0	66	0	79	0	116	27	424
22:15	0	0	0	20	120	0	67	0	83	0	96	30	416
22:30	0	0	0	13	87	0	69	0	92	0	75	28	364
22:45	0	0	0	15	84	0	52	0	51	0	72	23	297
Total	0	0	0	77	398	0	254	0	305	0	359	108	1501
Grand Total	0	0	0	516	2581	0	1343	0	1802	0	2033	474	8749
Apprch %	0	0	0	16.7	83.3	0	42.7	0	57.3	0	81.1	18.9	
Total %	0	0	0	5.9	29.5	0	15.4	0	20.6	0	23.2	5.4	

City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810074  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

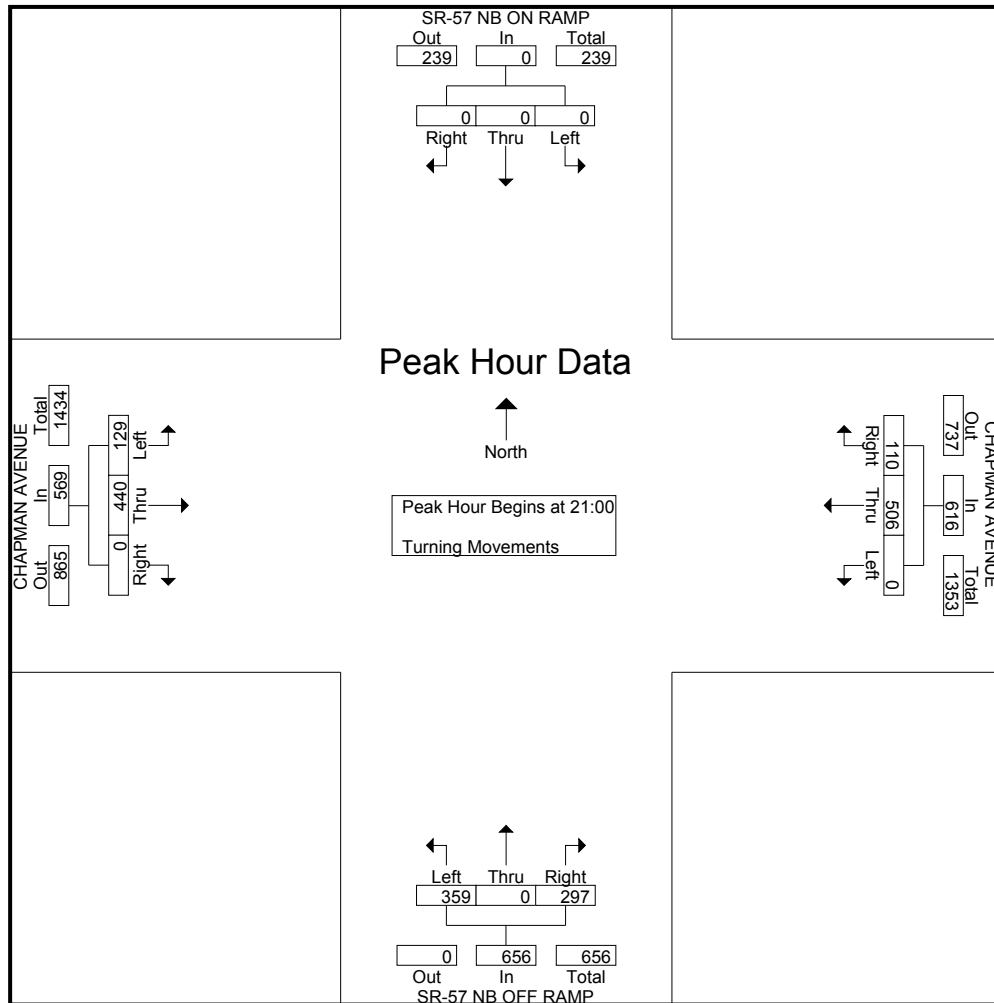
	SR-57 NB ON RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 NB OFF RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	0	0	0	44	234	0	278	116	0	166	282	0	178	28	206	766
18:15	0	0	0	0	41	238	0	279	95	0	129	224	0	154	33	187	690
18:30	0	0	0	0	42	229	0	271	83	0	160	243	0	175	27	202	716
18:45	0	0	0	0	49	219	0	268	121	0	142	263	0	175	35	210	741
Total Volume	0	0	0	0	176	920	0	1096	415	0	597	1012	0	682	123	805	2913
% App. Total	0	0	0	0	16.1	83.9	0		41	0	59		0	84.7	15.3		
PHF	.000	.000	.000	.000	.898	.966	.000	.982	.857	.000	.899	.897	.000	.958	.879	.958	.951



City: FULLERTON  
N-S Direction: SR-57 NB RAMPS  
E-W Direction: CHAPMAN AVENUE

File Name : H1810074  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	SR-57 NB ON RAMP Southbound				CHAPMAN AVENUE Westbound				SR-57 NB OFF RAMP Northbound				CHAPMAN AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	0	0	0	0	30	130	0	160	74	0	84	158	0	104	28	132	450
21:15	0	0	0	0	20	125	0	145	70	0	99	169	0	132	42	174	488
21:30	0	0	0	0	30	129	0	159	94	0	82	176	0	110	22	132	467
21:45	0	0	0	0	30	122	0	152	59	0	94	153	0	94	37	131	436
Total Volume	0	0	0	0	110	506	0	616	297	0	359	656	0	440	129	569	1841
% App. Total	0	0	0	0	17.9	82.1	0		45.3	0	54.7		0	77.3	22.7		
PHF	.000	.000	.000	.000	.917	.973	.000	.963	.790	.000	.907	.932	.000	.833	.768	.818	.943



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1810075  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

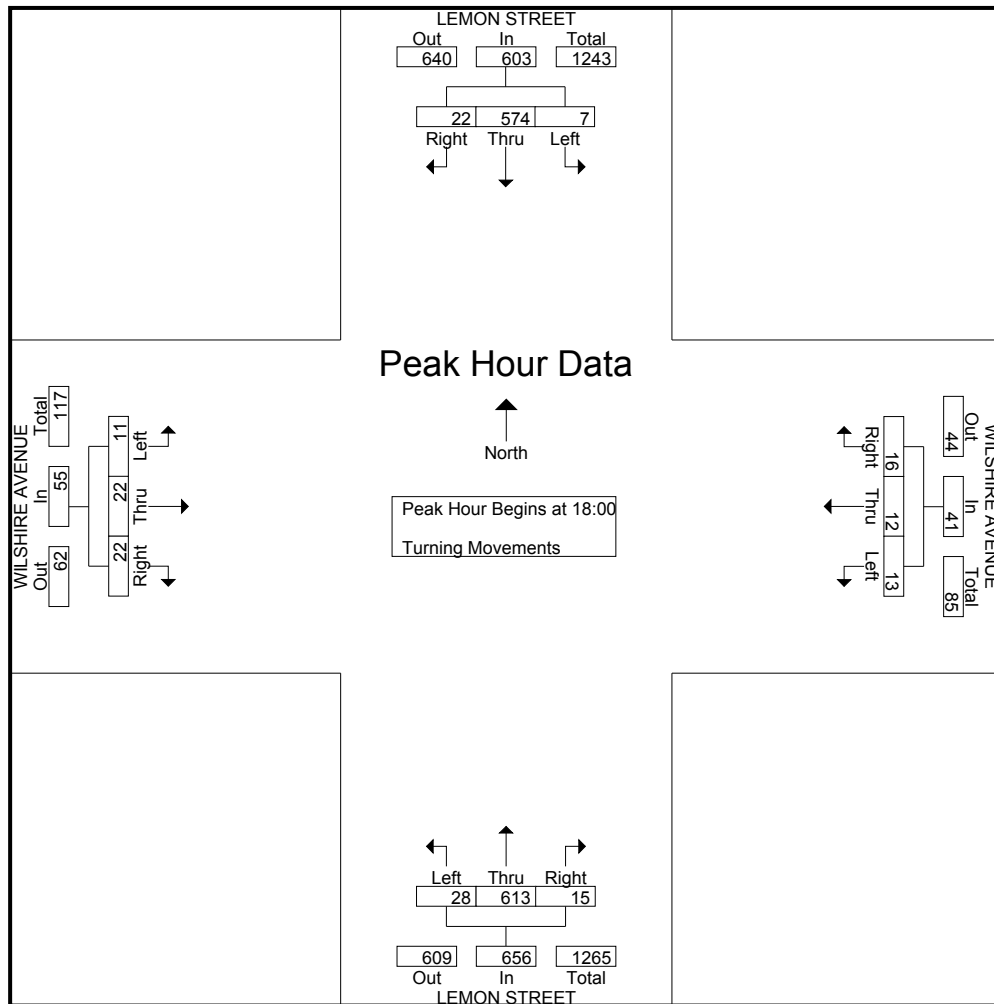
Groups Printed- Turning Movements

	LEMON STREET Southbound			WILSHIRE AVENUE Westbound			LEMON STREET Northbound			WILSHIRE AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	5	149	3	5	5	5	4	178	8	7	5	4	378
18:15	6	147	4	2	5	2	4	154	8	6	6	1	345
18:30	6	136	0	4	2	4	4	146	8	4	7	4	325
18:45	5	142	0	5	0	2	3	135	4	5	4	2	307
Total	22	574	7	16	12	13	15	613	28	22	22	11	1355
19:00	5	120	3	3	4	5	3	115	8	10	5	3	284
19:15	4	106	1	0	3	3	4	110	8	8	1	1	249
19:30	3	84	2	1	5	2	4	111	5	7	6	5	235
19:45	5	86	1	1	2	1	2	79	8	4	1	2	192
Total	17	396	7	5	14	11	13	415	29	29	13	11	960
*** BREAK ***													
21:00	0	82	2	2	1	2	3	61	0	4	3	5	165
21:15	3	59	2	0	1	4	4	61	2	8	2	4	150
21:30	1	62	1	1	1	0	3	67	5	4	2	0	147
21:45	0	69	1	3	0	0	0	73	4	1	1	1	153
Total	4	272	6	6	3	6	10	262	11	17	8	10	615
22:00	1	104	2	1	4	0	4	90	3	5	0	2	216
22:15	3	84	4	0	1	2	3	59	3	2	1	2	164
22:30	0	80	0	1	3	1	0	47	2	3	3	0	140
22:45	2	46	1	1	1	1	2	44	4	8	2	2	114
Total	6	314	7	3	9	4	9	240	12	18	6	6	634
Grand Total	49	1556	27	30	38	34	47	1530	80	86	49	38	3564
Apprch %	3	95.3	1.7	29.4	37.3	33.3	2.8	92.3	4.8	49.7	28.3	22	
Total %	1.4	43.7	0.8	0.8	1.1	1	1.3	42.9	2.2	2.4	1.4	1.1	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1810075  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

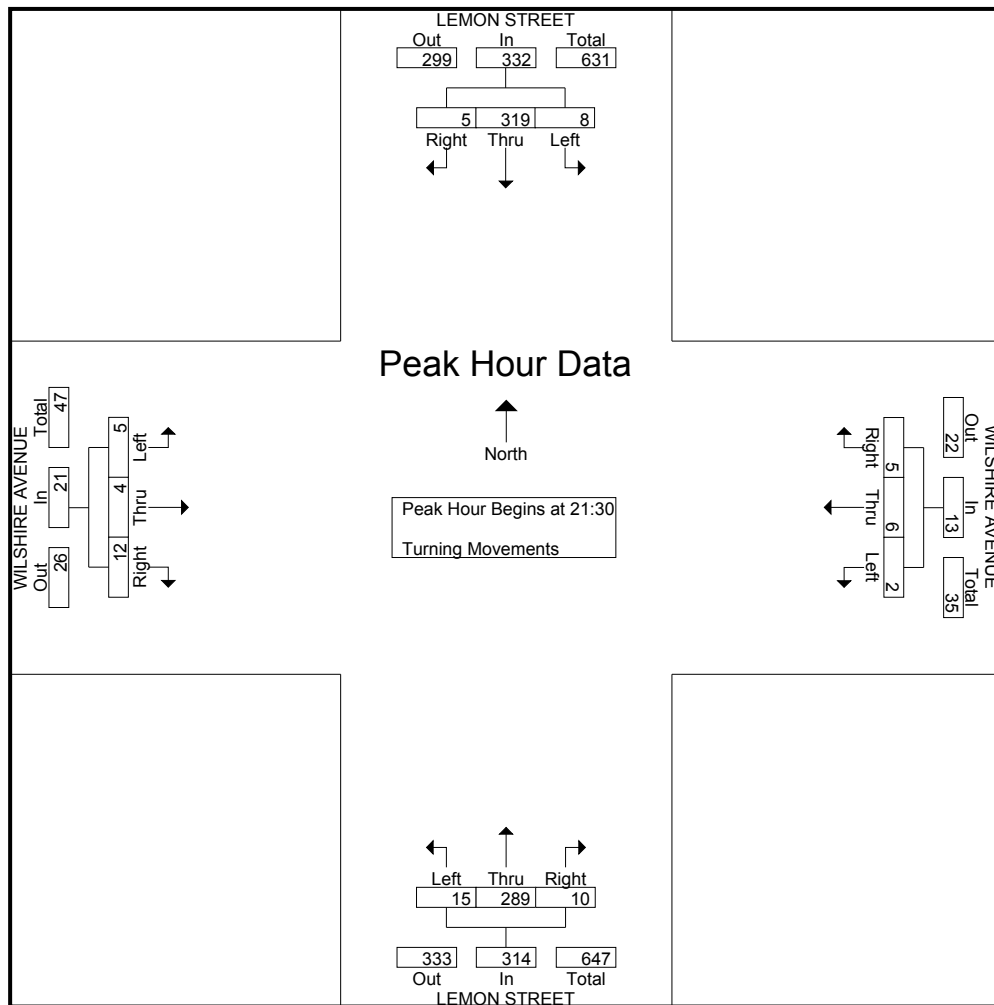
	LEMON STREET Southbound				WILSHIRE AVENUE Westbound				LEMON STREET Northbound				WILSHIRE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	5	149	3	157	5	5	5	15	4	178	8	190	7	5	4	16	378
18:15	6	147	4	157	2	5	2	9	4	154	8	166	6	6	1	13	345
18:30	6	136	0	142	4	2	4	10	4	146	8	158	4	7	4	15	325
18:45	5	142	0	147	5	0	2	7	3	135	4	142	5	4	2	11	307
Total Volume	22	574	7	603	16	12	13	41	15	613	28	656	22	22	11	55	1355
% App. Total	3.6	95.2	1.2		39	29.3	31.7		2.3	93.4	4.3		40	40	20		
PHF	.917	.963	.438	.960	.800	.600	.650	.683	.938	.861	.875	.863	.786	.786	.688	.859	.896



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: WILSHIRE AVENUE

File Name : H1810075  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				WILSHIRE AVENUE Westbound				LEMON STREET Northbound				WILSHIRE AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	1	62	1	64	1	1	0	2	3	67	5	75	4	2	0	6	147
21:45	0	69	1	70	3	0	0	3	0	73	4	77	1	1	1	3	153
22:00	1	104	2	107	1	4	0	5	4	90	3	97	5	0	2	7	216
22:15	3	84	4	91	0	1	2	3	3	59	3	65	2	1	2	5	164
Total Volume	5	319	8	332	5	6	2	13	10	289	15	314	12	4	5	21	680
% App. Total	1.5	96.1	2.4		38.5	46.2	15.4		3.2	92	4.8		57.1	19	23.8		
PHF	.417	.767	.500	.776	.417	.375	.250	.650	.625	.803	.750	.809	.600	.500	.625	.750	.787





City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810076  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

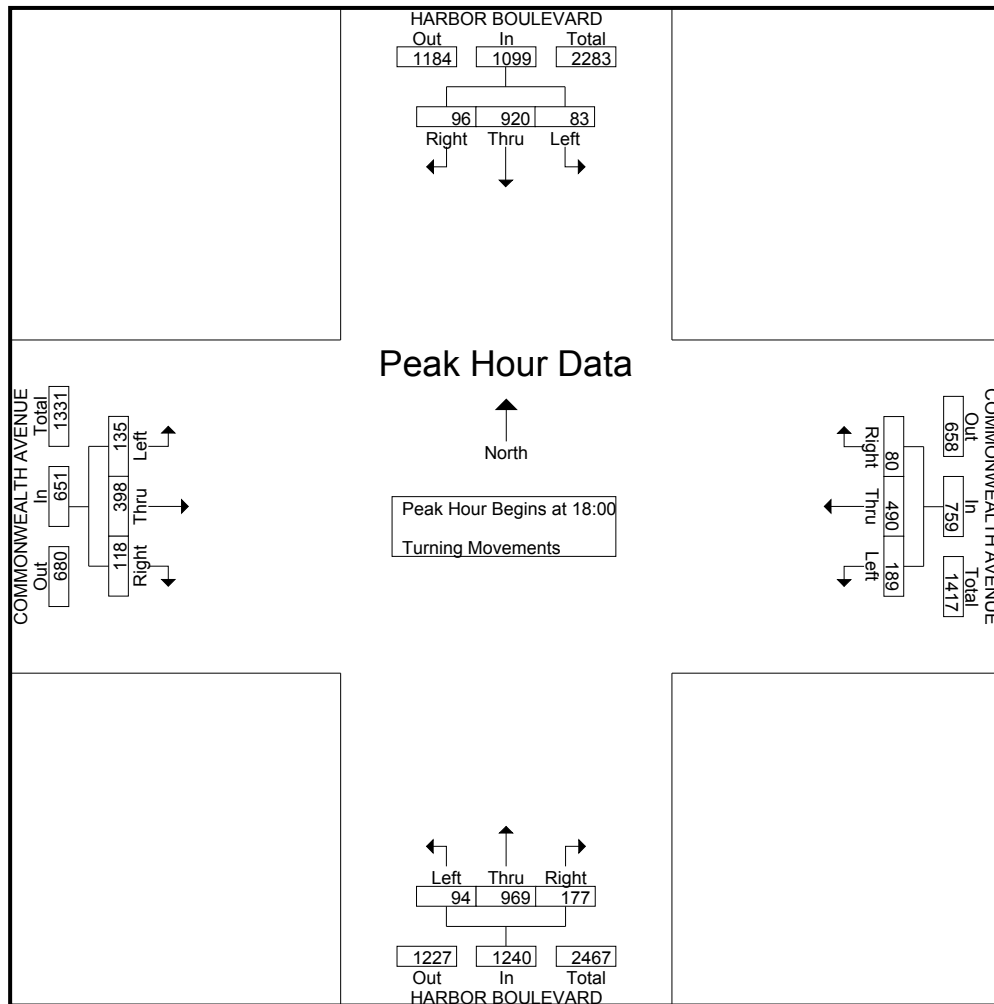
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			COMMONWEALTH AVENUE Westbound			HARBOR BOULEVARD Northbound			COMMONWEALTH AVENUE Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	28	215	19	15	132	53	45	235	32	28	122	25	949
18:15	26	240	21	18	110	37	40	257	23	35	101	41	949
18:30	22	232	17	27	118	47	48	234	16	22	86	35	904
18:45	20	233	26	20	130	52	44	243	23	33	89	34	947
Total	96	920	83	80	490	189	177	969	94	118	398	135	3749
19:00	29	211	18	25	113	47	47	199	16	27	98	38	868
19:15	32	206	16	17	78	32	37	210	25	36	74	24	787
19:30	26	189	9	20	85	41	30	196	24	23	82	20	745
19:45	29	153	16	17	70	42	45	199	18	30	70	18	707
Total	116	759	59	79	346	162	159	804	83	116	324	100	3107
*** BREAK ***													
21:00	17	171	16	12	54	29	31	148	15	30	64	21	608
21:15	10	134	14	17	49	33	37	140	13	20	62	13	542
21:30	10	135	11	12	51	37	26	132	17	27	49	15	522
21:45	24	180	13	15	66	30	29	154	20	24	69	26	650
Total	61	620	54	56	220	129	123	574	65	101	244	75	2322
22:00	19	155	12	10	40	35	27	128	13	25	53	13	530
22:15	21	151	13	6	45	37	36	154	13	22	53	18	569
22:30	16	159	22	16	73	39	20	122	17	27	71	20	602
22:45	18	111	7	10	42	30	28	124	11	10	66	18	475
Total	74	576	54	42	200	141	111	528	54	84	243	69	2176
Grand Total	347	2875	250	257	1256	621	570	2875	296	419	1209	379	11354
Apprch %	10	82.8	7.2	12	58.9	29.1	15.2	76.9	7.9	20.9	60.2	18.9	
Total %	3.1	25.3	2.2	2.3	11.1	5.5	5	25.3	2.6	3.7	10.6	3.3	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810076  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

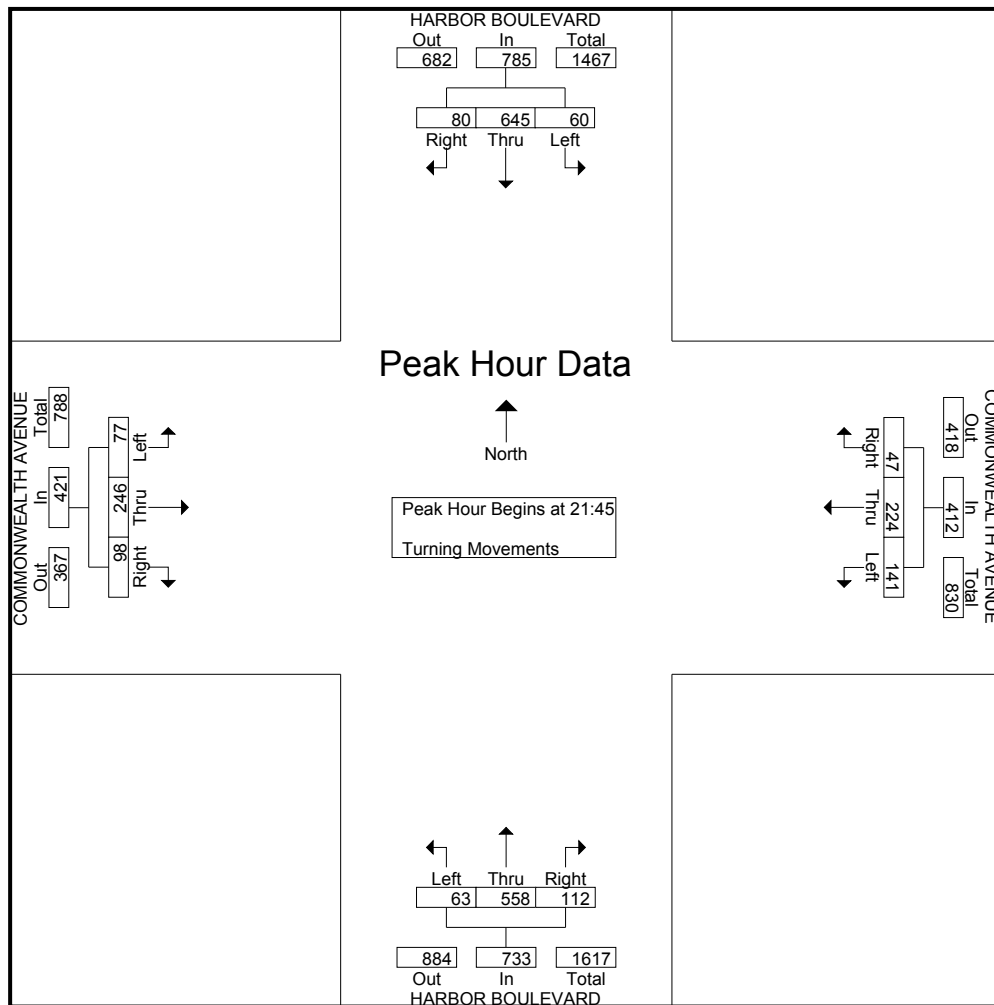
	HARBOR BOULEVARD Southbound				COMMONWEALTH AVENUE Westbound				HARBOR BOULEVARD Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	28	215	19	262	15	132	53	200	45	235	32	312	28	122	25	175	949
18:15	26	240	21	287	18	110	37	165	40	257	23	320	35	101	41	177	949
18:30	22	232	17	271	27	118	47	192	48	234	16	298	22	86	35	143	904
18:45	20	233	26	279	20	130	52	202	44	243	23	310	33	89	34	156	947
Total Volume	96	920	83	1099	80	490	189	759	177	969	94	1240	118	398	135	651	3749
% App. Total	8.7	83.7	7.6		10.5	64.6	24.9		14.3	78.1	7.6		18.1	61.1	20.7		
PHF	.857	.958	.798	.957	.741	.928	.892	.939	.922	.943	.734	.969	.843	.816	.823	.919	.988



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810076  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				COMMONWEALTH AVENUE Westbound				HARBOR BOULEVARD Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:45																	
21:45	24	180	13	217	15	66	30	111	29	154	20	203	24	69	26	119	650
22:00	19	155	12	186	10	40	35	85	27	128	13	168	25	53	13	91	530
22:15	21	151	13	185	6	45	37	88	36	154	13	203	22	53	18	93	569
22:30	16	159	22	197	16	73	39	128	20	122	17	159	27	71	20	118	602
Total Volume	80	645	60	785	47	224	141	412	112	558	63	733	98	246	77	421	2351
% App. Total	10.2	82.2	7.6		11.4	54.4	34.2		15.3	76.1	8.6		23.3	58.4	18.3		
PHF	.833	.896	.682	.904	.734	.767	.904	.805	.778	.906	.788	.903	.907	.866	.740	.884	.904



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810077  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

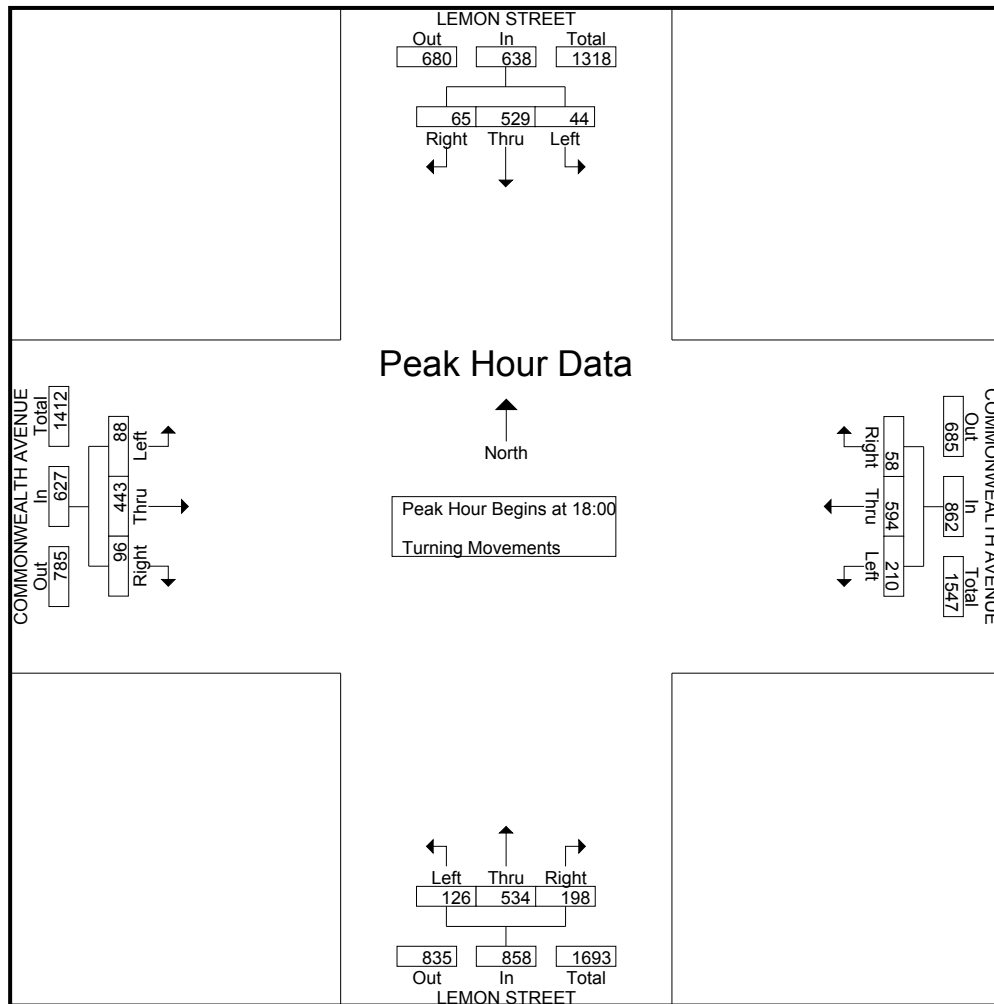
Groups Printed- Turning Movements

	LEMON STREET Southbound			COMMONWEALTH AVENUE Westbound			LEMON STREET Northbound			COMMONWEALTH AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	11	154	6	14	162	63	60	162	32	27	134	18	843
18:15	13	135	9	16	132	49	45	149	27	19	105	14	713
18:30	20	120	17	17	144	54	51	120	29	21	99	25	717
18:45	21	120	12	11	156	44	42	103	38	29	105	31	712
Total	65	529	44	58	594	210	198	534	126	96	443	88	2985
19:00	17	116	13	18	135	36	41	113	27	20	88	11	635
19:15	8	112	7	25	95	54	50	95	25	24	93	15	603
19:30	14	82	7	7	104	50	42	97	23	25	82	26	559
19:45	11	82	5	14	87	29	42	77	29	19	94	10	499
Total	50	392	32	64	421	169	175	382	104	88	357	62	2296
*** BREAK ***													
21:00	11	65	9	4	55	20	31	66	22	12	72	5	372
21:15	7	67	6	8	59	21	26	62	25	18	93	9	401
21:30	10	61	7	7	59	17	32	59	21	20	55	11	359
21:45	8	52	6	6	62	21	36	68	15	19	84	11	388
Total	36	245	28	25	235	79	125	255	83	69	304	36	1520
22:00	12	103	3	11	52	14	28	72	22	17	57	15	406
22:15	15	76	7	2	50	28	25	54	14	16	60	8	355
22:30	15	68	5	6	89	23	20	39	21	13	61	15	375
22:45	7	48	4	0	48	18	30	51	15	19	68	8	316
Total	49	295	19	19	239	83	103	216	72	65	246	46	1452
Grand Total	200	1461	123	166	1489	541	601	1387	385	318	1350	232	8253
Apprch %	11.2	81.9	6.9	7.6	67.8	24.6	25.3	58.4	16.2	16.7	71.1	12.2	
Total %	2.4	17.7	1.5	2	18	6.6	7.3	16.8	4.7	3.9	16.4	2.8	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810077  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

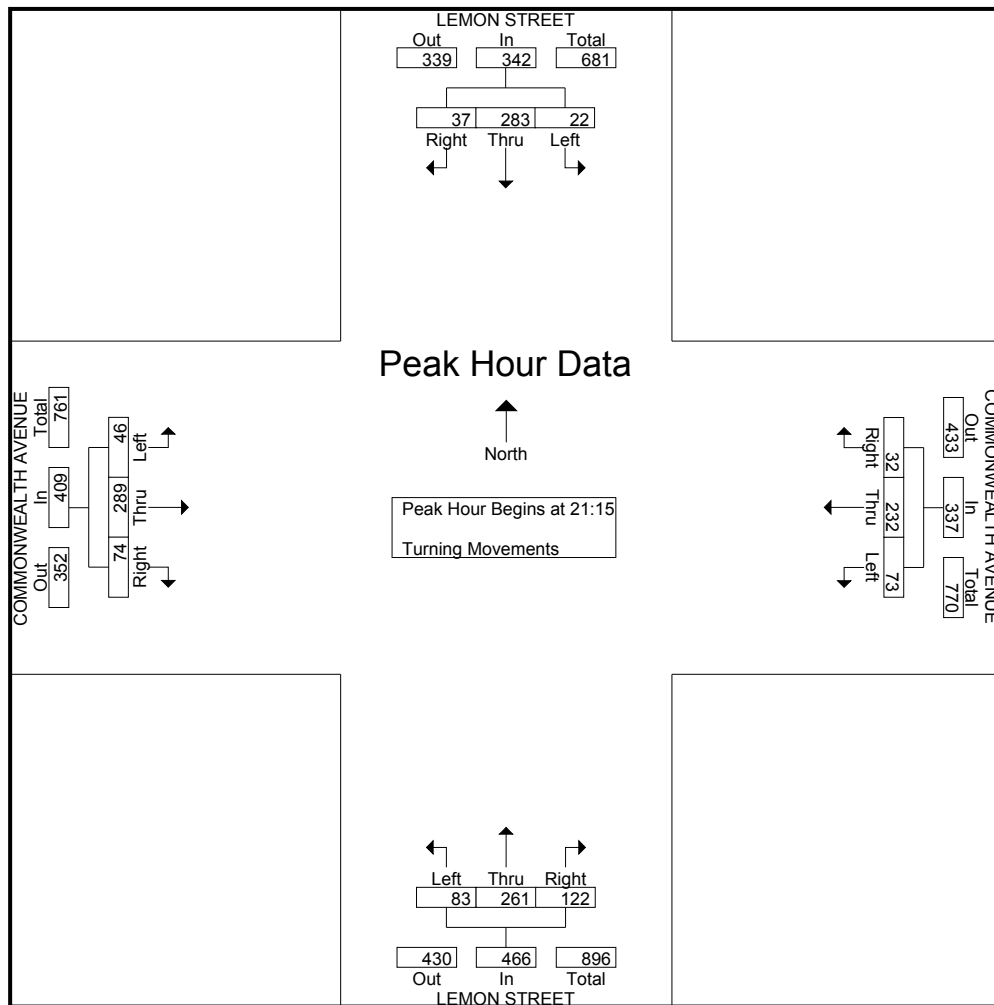
	LEMON STREET Southbound				COMMONWEALTH AVENUE Westbound				LEMON STREET Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	11	154	6	171	14	162	63	239	60	162	32	254	27	134	18	179	843
18:15	13	135	9	157	16	132	49	197	45	149	27	221	19	105	14	138	713
18:30	20	120	17	157	17	144	54	215	51	120	29	200	21	99	25	145	717
18:45	21	120	12	153	11	156	44	211	42	103	38	183	29	105	31	165	712
Total Volume	65	529	44	638	58	594	210	862	198	534	126	858	96	443	88	627	2985
% App. Total	10.2	82.9	6.9		6.7	68.9	24.4		23.1	62.2	14.7		15.3	70.7	14		
PHF	.774	.859	.647	.933	.853	.917	.833	.902	.825	.824	.829	.844	.828	.826	.710	.876	.885



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: COMMONWEALTH AVENUE

File Name : H1810077  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				COMMONWEALTH AVENUE Westbound				LEMON STREET Northbound				COMMONWEALTH AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	7	67	6	80	8	59	21	88	26	62	25	113	18	93	9	120	401
21:30	10	61	7	78	7	59	17	83	32	59	21	112	20	55	11	86	359
21:45	8	52	6	66	6	62	21	89	36	68	15	119	19	84	11	114	388
22:00	12	103	3	118	11	52	14	77	28	72	22	122	17	57	15	89	406
Total Volume	37	283	22	342	32	232	73	337	122	261	83	466	74	289	46	409	1554
% App. Total	10.8	82.7	6.4		9.5	68.8	21.7		26.2	56	17.8		18.1	70.7	11.2		
PHF	.771	.687	.786	.725	.727	.935	.869	.947	.847	.906	.830	.955	.925	.777	.767	.852	.957



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1810078  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

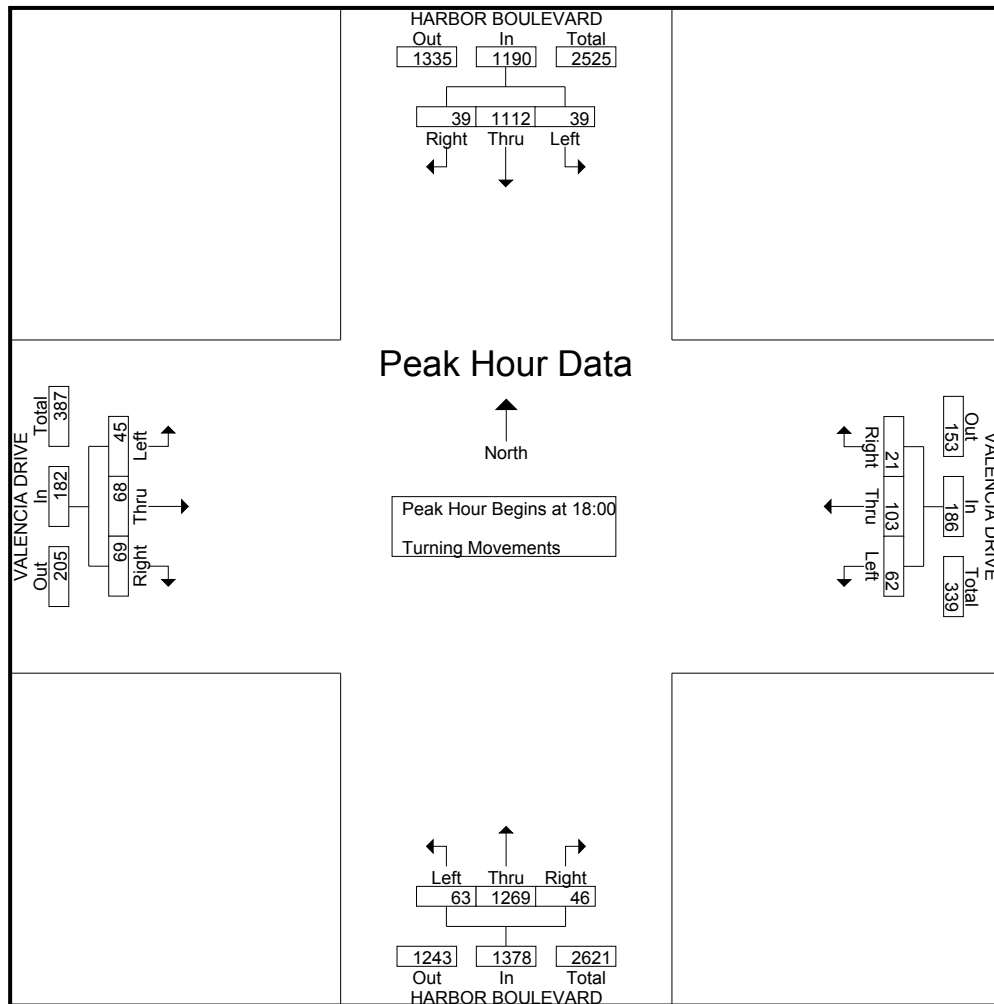
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			VALENCIA DRIVE Westbound			HARBOR BOULEVARD Northbound			VALENCIA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	9	272	15	3	28	13	10	308	17	16	20	12	723
18:15	13	265	12	8	29	21	8	328	21	20	15	11	751
18:30	6	274	5	7	27	18	14	316	9	15	20	12	723
18:45	11	301	7	3	19	10	14	317	16	18	13	10	739
Total	39	1112	39	21	103	62	46	1269	63	69	68	45	2936
19:00	7	261	10	1	15	16	6	256	16	14	16	9	627
19:15	5	275	8	5	18	14	5	286	12	19	12	7	666
19:30	9	243	10	3	20	8	12	241	11	16	9	10	592
19:45	8	204	7	8	7	12	9	263	10	12	9	6	555
Total	29	983	35	17	60	50	32	1046	49	61	46	32	2440
*** BREAK ***													
21:00	6	225	9	3	18	6	5	202	11	12	9	3	509
21:15	7	169	5	3	10	12	5	203	9	8	6	1	438
21:30	5	175	3	4	7	9	3	193	6	5	7	7	424
21:45	5	221	9	5	6	8	4	194	5	10	11	2	480
Total	23	790	26	15	41	35	17	792	31	35	33	13	1851
22:00	5	187	6	3	7	14	4	190	12	5	9	2	444
22:15	9	176	4	1	13	12	10	204	8	3	6	9	455
22:30	9	213	3	2	5	7	6	210	5	4	11	5	480
22:45	5	170	5	5	6	6	2	158	5	5	5	6	378
Total	28	746	18	11	31	39	22	762	30	17	31	22	1757
Grand Total	119	3631	118	64	235	186	117	3869	173	182	178	112	8984
Apprch %	3.1	93.9	3.1	13.2	48.5	38.4	2.8	93	4.2	38.6	37.7	23.7	
Total %	1.3	40.4	1.3	0.7	2.6	2.1	1.3	43.1	1.9	2	2	1.2	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1810078  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

	HARBOR BOULEVARD Southbound				VALENCIA DRIVE Westbound				HARBOR BOULEVARD Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	9	272	15	296	3	28	13	44	10	308	17	335	16	20	12	48	723
18:15	13	265	12	290	8	29	21	58	8	328	21	357	20	15	11	46	751
18:30	6	274	5	285	7	27	18	52	14	316	9	339	15	20	12	47	723
18:45	11	301	7	319	3	19	10	32	14	317	16	347	18	13	10	41	739
Total Volume	39	1112	39	1190	21	103	62	186	46	1269	63	1378	69	68	45	182	2936
% App. Total	3.3	93.4	3.3		11.3	55.4	33.3		3.3	92.1	4.6		37.9	37.4	24.7		
PHF	.750	.924	.650	.933	.656	.888	.738	.802	.821	.967	.750	.965	.863	.850	.938	.948	.977

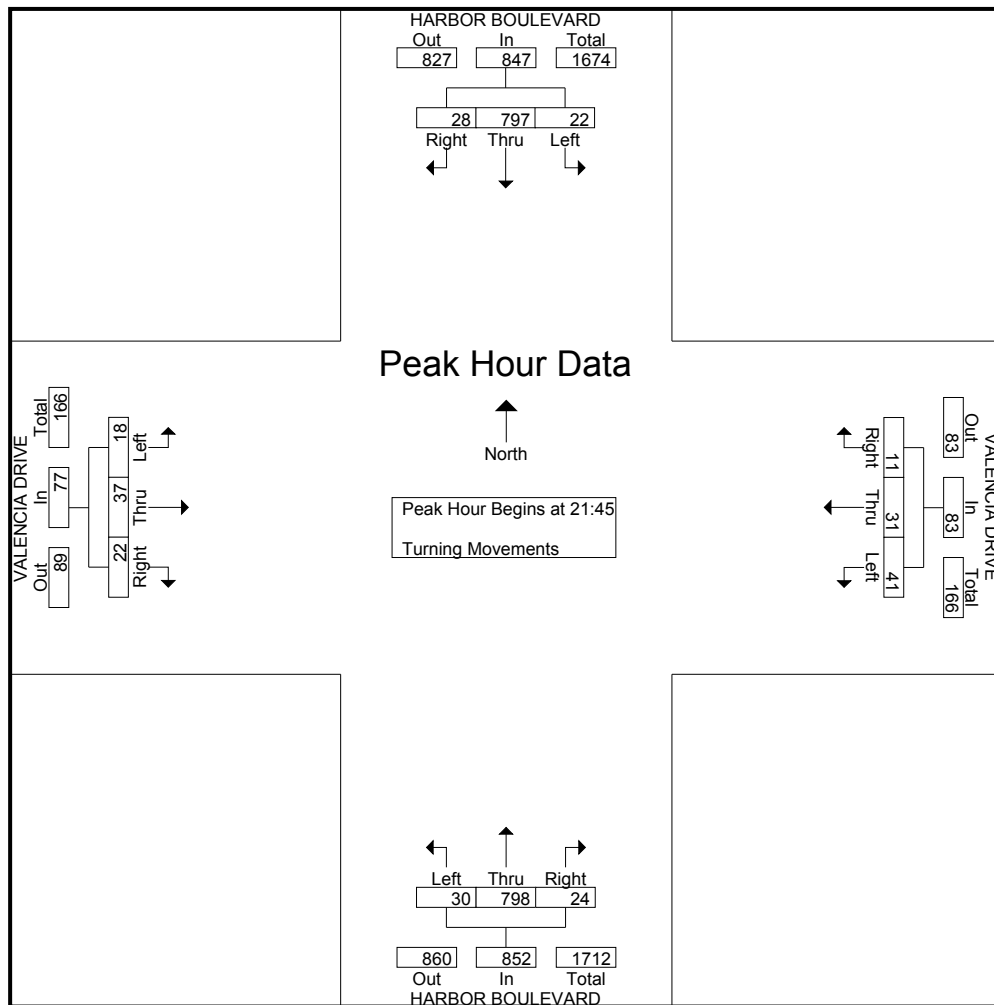




City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: VALENCIA DRIVE

File Name : H1810078  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				VALENCIA DRIVE Westbound				HARBOR BOULEVARD Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:45																	
21:45	5	221	9	235	5	6	8	19	4	194	5	203	10	11	2	23	480
22:00	5	187	6	198	3	7	14	24	4	190	12	206	5	9	2	16	444
22:15	9	176	4	189	1	13	12	26	10	204	8	222	3	6	9	18	455
22:30	9	213	3	225	2	5	7	14	6	210	5	221	4	11	5	20	480
Total Volume	28	797	22	847	11	31	41	83	24	798	30	852	22	37	18	77	1859
% App. Total	3.3	94.1	2.6		13.3	37.3	49.4		2.8	93.7	3.5		28.6	48.1	23.4		
PHF	.778	.902	.611	.901	.550	.596	.732	.798	.600	.950	.625	.959	.550	.841	.500	.837	.968



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1810079  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

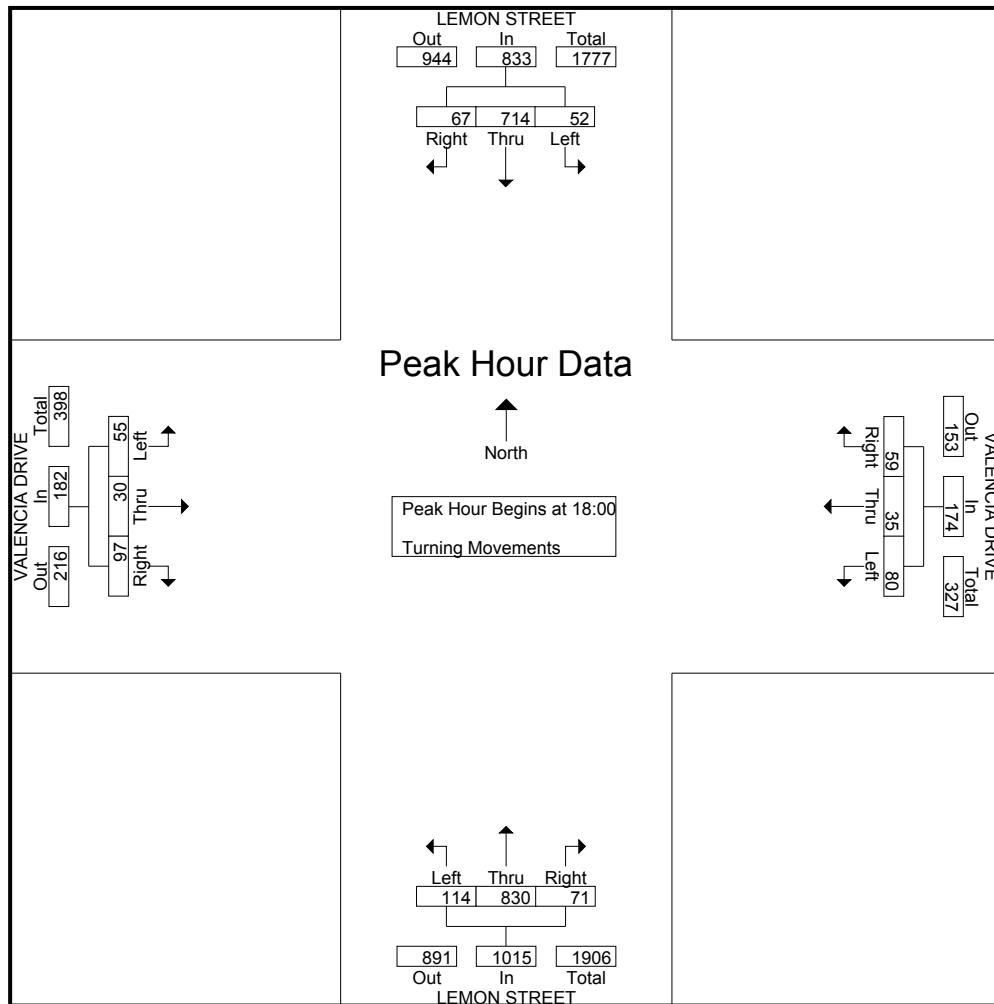
Groups Printed- Turning Movements

	LEMON STREET Southbound			VALENCIA DRIVE Westbound			LEMON STREET Northbound			VALENCIA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	21	180	15	16	12	18	16	226	29	37	8	21	599
18:15	13	199	19	19	13	22	23	216	22	23	12	13	594
18:30	20	163	8	11	7	23	17	210	37	15	6	9	526
18:45	13	172	10	13	3	17	15	178	26	22	4	12	485
Total	67	714	52	59	35	80	71	830	114	97	30	55	2204
19:00	16	176	8	13	5	18	13	156	21	20	7	5	458
19:15	19	161	12	3	6	14	21	178	28	11	7	2	462
19:30	7	142	12	12	6	18	11	160	20	12	4	7	411
19:45	4	119	12	5	6	18	16	130	14	13	7	13	357
Total	46	598	44	33	23	68	61	624	83	56	25	27	1688
*** BREAK ***													
21:00	5	85	12	4	7	11	7	107	19	4	7	10	278
21:15	13	105	5	4	4	16	11	98	10	14	5	4	289
21:30	6	98	9	9	4	11	10	110	14	7	4	7	289
21:45	13	103	6	10	4	7	7	93	16	9	8	8	284
Total	37	391	32	27	19	45	35	408	59	34	24	29	1140
22:00	4	118	12	3	7	13	5	135	13	8	6	5	329
22:15	12	93	13	4	5	11	11	92	16	3	3	8	271
22:30	6	85	10	9	5	11	8	94	8	9	8	9	262
22:45	7	71	9	4	1	11	16	84	7	8	6	4	228
Total	29	367	44	20	18	46	40	405	44	28	23	26	1090
Grand Total	179	2070	172	139	95	239	207	2267	300	215	102	137	6122
Apprch %	7.4	85.5	7.1	29.4	20.1	50.5	7.5	81.7	10.8	47.4	22.5	30.2	
Total %	2.9	33.8	2.8	2.3	1.6	3.9	3.4	37	4.9	3.5	1.7	2.2	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1810079  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

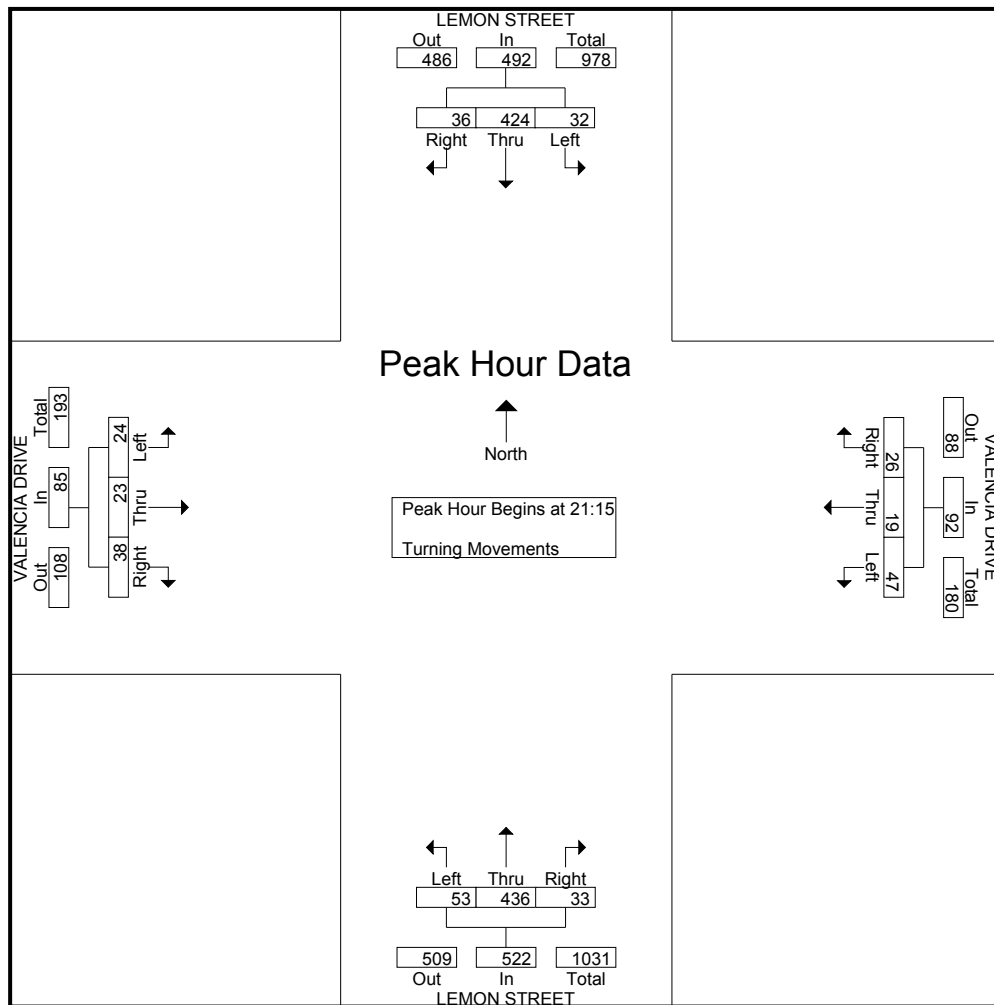
	LEMON STREET Southbound				VALENCIA DRIVE Westbound				LEMON STREET Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	21	180	15	216	16	12	18	46	16	226	29	271	37	8	21	66	599
18:15	13	199	19	231	19	13	22	54	23	216	22	261	23	12	13	48	594
18:30	20	163	8	191	11	7	23	41	17	210	37	264	15	6	9	30	526
18:45	13	172	10	195	13	3	17	33	15	178	26	219	22	4	12	38	485
Total Volume	67	714	52	833	59	35	80	174	71	830	114	1015	97	30	55	182	2204
% App. Total	8	85.7	6.2		33.9	20.1	46		7	81.8	11.2		53.3	16.5	30.2		
PHF	.798	.897	.684	.902	.776	.673	.870	.806	.772	.918	.770	.936	.655	.625	.655	.689	.920



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: VALENCIA DRIVE

File Name : H1810079  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				VALENCIA DRIVE Westbound				LEMON STREET Northbound				VALENCIA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	13	105	5	123	4	4	16	24	11	98	10	119	14	5	4	23	289
21:30	6	98	9	113	9	4	11	24	10	110	14	134	7	4	7	18	289
21:45	13	103	6	122	10	4	7	21	7	93	16	116	9	8	8	25	284
22:00	4	118	12	134	3	7	13	23	5	135	13	153	8	6	5	19	329
Total Volume	36	424	32	492	26	19	47	92	33	436	53	522	38	23	24	85	1191
% App. Total	7.3	86.2	6.5		28.3	20.7	51.1		6.3	83.5	10.2		44.7	27.1	28.2		
PHF	.692	.898	.667	.918	.650	.679	.734	.958	.750	.807	.828	.853	.679	.719	.750	.850	.905



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810080  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

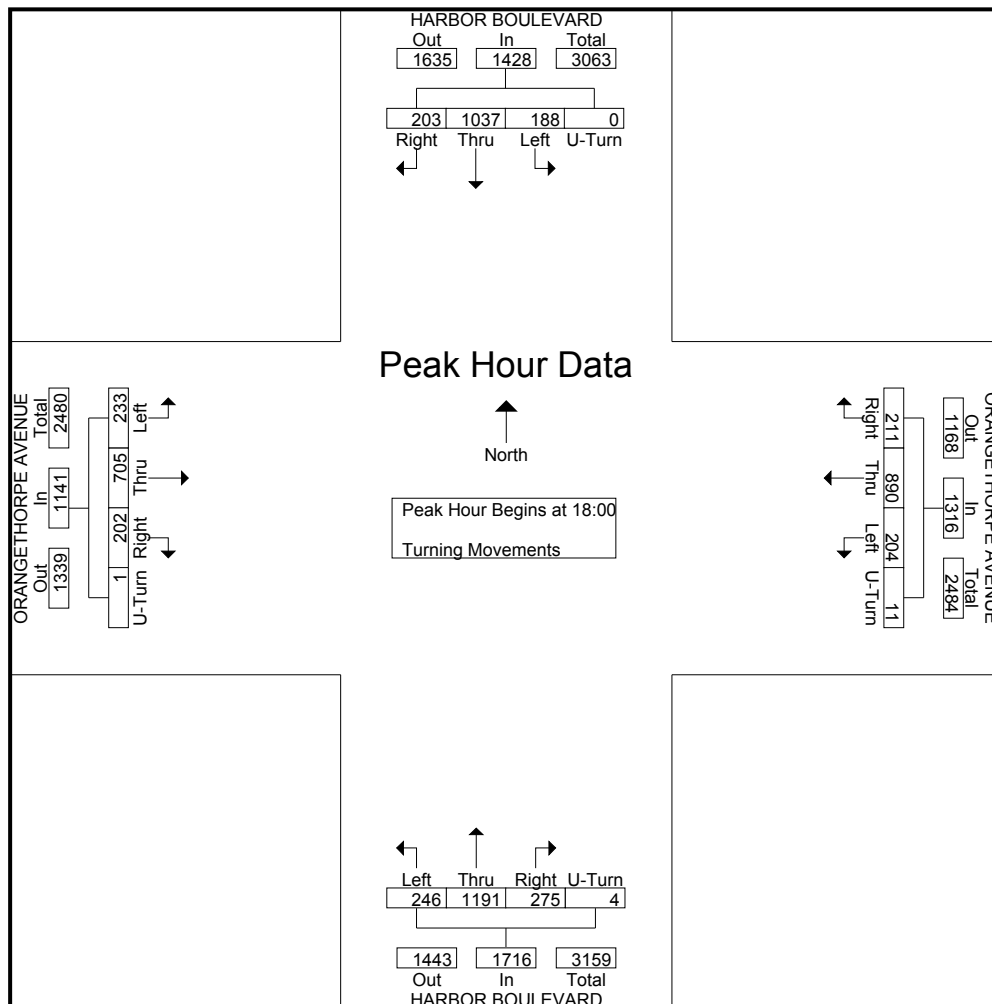
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound				ORANGETHORPE AVENUE Westbound				HARBOR BOULEVARD Northbound				ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
18:00	40	262	51	0	40	249	54	1	65	302	76	1	48	197	60	0	1446
18:15	58	248	41	0	63	213	52	6	75	306	58	0	53	177	59	0	1409
18:30	64	258	40	0	50	210	46	1	72	286	61	2	51	178	63	0	1382
18:45	41	269	56	0	58	218	52	3	63	297	51	1	50	153	51	1	1364
Total	203	1037	188	0	211	890	204	11	275	1191	246	4	202	705	233	1	5601
19:00	55	247	49	1	64	214	51	7	64	232	50	1	60	147	54	0	1296
19:15	38	252	43	1	51	216	52	5	65	252	63	0	54	146	55	1	1294
19:30	54	242	46	3	45	173	47	2	44	236	48	0	53	132	54	3	1182
19:45	35	209	37	1	38	147	50	3	54	231	33	0	60	131	41	1	1071
Total	182	950	175	6	198	750	200	17	227	951	194	1	227	556	204	5	4843
*** BREAK ***																	
21:00	31	224	29	1	39	122	46	4	40	158	28	1	27	77	39	0	866
21:15	18	165	27	0	23	116	46	3	24	183	38	0	31	76	38	0	788
21:30	32	158	17	1	31	113	45	1	29	153	24	0	44	67	36	0	751
21:45	25	196	26	1	41	101	41	4	22	170	30	1	32	80	28	1	799
Total	106	743	99	3	134	452	178	12	115	664	120	2	134	300	141	1	3204
22:00	33	148	23	0	24	90	42	2	12	171	25	0	31	61	22	0	684
22:15	25	163	22	2	20	58	37	3	28	197	17	0	28	72	32	0	704
22:30	25	179	26	3	30	52	25	1	16	204	25	1	21	55	24	0	687
22:45	26	140	25	1	19	62	36	2	17	134	29	0	25	61	24	0	601
Total	109	630	96	6	93	262	140	8	73	706	96	1	105	249	102	0	2676
Grand Total	600	3360	558	15	636	2354	722	48	690	3512	656	8	668	1810	680	7	16324
Apprch %	13.2	74.1	12.3	0.3	16.9	62.6	19.2	1.3	14.2	72.2	13.5	0.2	21.1	57.2	21.5	0.2	
Total %	3.7	20.6	3.4	0.1	3.9	14.4	4.4	0.3	4.2	21.5	4	0	4.1	11.1	4.2	0	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810080  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

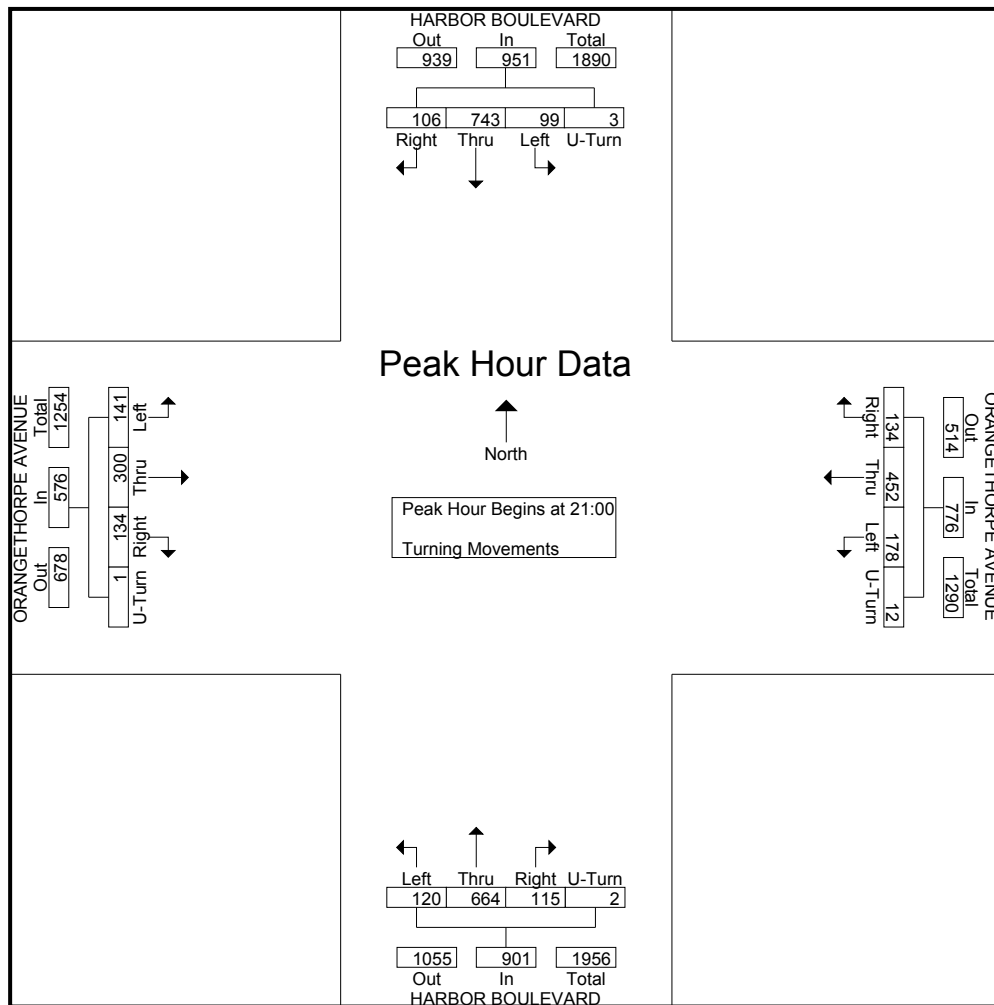
	HARBOR BOULEVARD Southbound					ORANGETHORPE AVENUE Westbound					HARBOR BOULEVARD Northbound					ORANGETHORPE AVENUE Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 18:00																					
18:00	40	262	51	0	353	40	249	54	1	344	65	302	76	1	444	48	197	60	0	305	1446
18:15	58	248	41	0	347	63	213	52	6	334	75	306	58	0	439	53	177	59	0	289	1409
18:30	64	258	40	0	362	50	210	46	1	307	72	286	61	2	421	51	178	63	0	292	1382
18:45	41	269	56	0	366	58	218	52	3	331	63	297	51	1	412	50	153	51	1	255	1364
Total Volume	203	1037	188	0	1428	211	890	204	11	1316	275	1191	246	4	1716	202	705	233	1	1141	5601
% App. Total																					
PHF	.793	.964	.839	.000	.975	.837	.894	.944	.458	.956	.917	.973	.809	.500	.966	.953	.895	.925	.250	.935	.968



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810080  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound					ORANGETHORPE AVENUE Westbound					HARBOR BOULEVARD Northbound					ORANGETHORPE AVENUE Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 21:00																					
21:00	31	224	29	1	285	39	122	46	4	211	40	158	28	1	227	27	77	39	0	143	866
21:15	18	165	27	0	210	23	116	46	3	188	24	183	38	0	245	31	76	38	0	145	788
21:30	32	158	17	1	208	31	113	45	1	190	29	153	24	0	206	44	67	36	0	147	751
21:45	25	196	26	1	248	41	101	41	4	187	22	170	30	1	223	32	80	28	1	141	799
Total Volume	106	743	99	3	951	134	452	178	12	776	115	664	120	2	901	134	300	141	1	576	3204
% App. Total	11.1	78.1	10.4	0.3		17.3	58.2	22.9	1.5		12.8	73.7	13.3	0.2		23.3	52.1	24.5	0.2		
PHF	.828	.829	.853	.750	.834	.817	.926	.967	.750	.919	.719	.907	.789	.500	.919	.761	.938	.904	.250	.980	.925



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810081  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

Groups Printed- Turning Movements

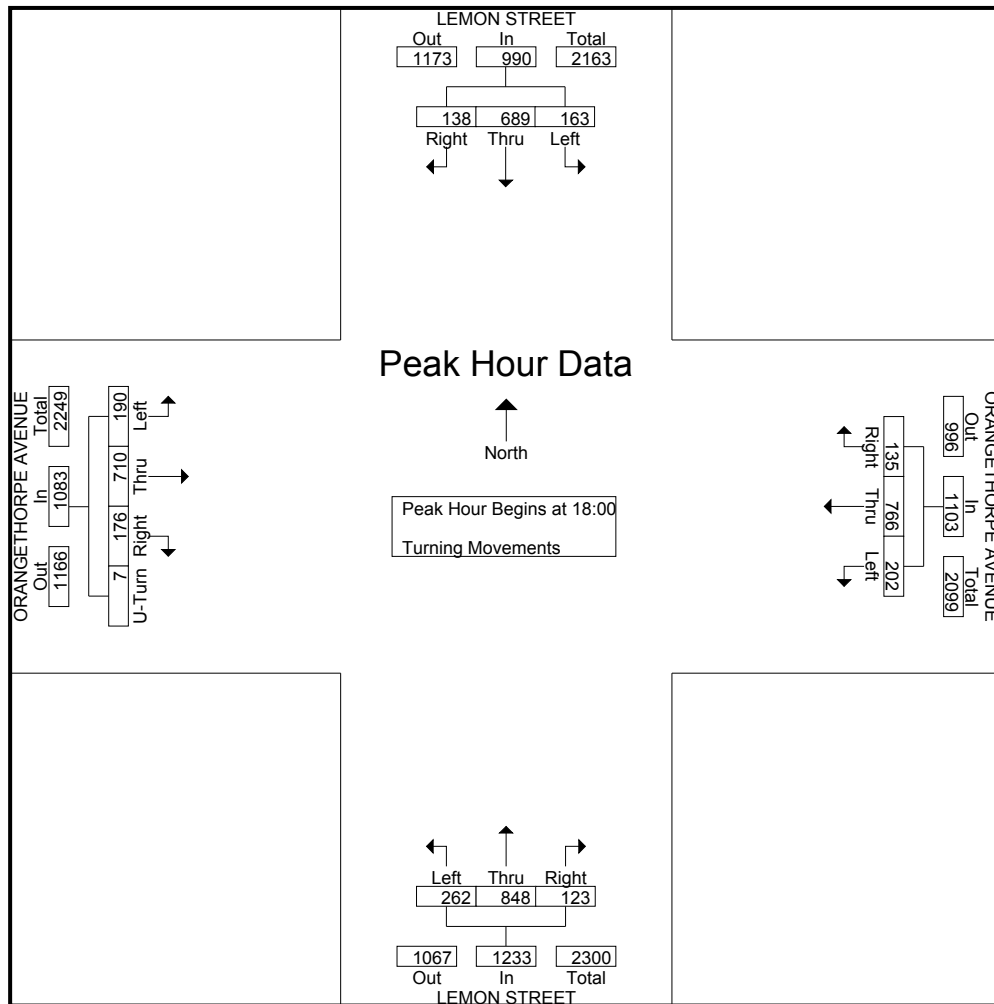
	LEMON STREET Southbound			ORANGETHORPE AVENUE Westbound			LEMON STREET Northbound			ORANGETHORPE AVENUE Eastbound				
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
18:00	37	206	56	26	211	49	34	227	66	51	180	42	2	1187
18:15	33	154	37	27	204	66	37	229	69	45	181	52	3	1137
18:30	34	163	30	40	166	43	27	214	58	38	187	58	0	1058
18:45	34	166	40	42	185	44	25	178	69	42	162	38	2	1027
Total	138	689	163	135	766	202	123	848	262	176	710	190	7	4409
19:00	34	150	38	30	186	37	29	195	63	45	161	38	2	1008
19:15	35	161	39	34	170	30	24	203	72	55	148	47	2	1020
19:30	25	135	39	29	125	28	7	158	67	49	126	33	2	823
19:45	19	121	34	18	86	17	8	135	54	52	160	37	1	742
Total	113	567	150	111	567	112	68	691	256	201	595	155	7	3593
*** BREAK ***														
21:00	17	88	21	18	80	16	11	95	45	52	92	23	1	559
21:15	22	121	18	12	80	20	10	109	57	56	107	21	2	635
21:30	16	127	24	14	71	17	17	118	39	33	78	17	0	571
21:45	17	136	18	13	68	21	10	111	41	30	106	15	0	586
Total	72	472	81	57	299	74	48	433	182	171	383	76	3	2351
22:00	18	112	19	20	52	15	13	106	26	38	61	22	3	505
22:15	11	118	14	21	53	12	4	104	30	31	75	10	0	483
22:30	14	94	10	11	39	10	13	90	26	31	65	11	3	417
22:45	6	95	11	12	31	13	12	80	35	27	59	23	0	404
Total	49	419	54	64	175	50	42	380	117	127	260	66	6	1809
Grand Total	372	2147	448	367	1807	438	281	2352	817	675	1948	487	23	12162
Apprch %	12.5	72.4	15.1	14.1	69.2	16.8	8.1	68.2	23.7	21.5	62.2	15.5	0.7	
Total %	3.1	17.7	3.7	3	14.9	3.6	2.3	19.3	6.7	5.6	16	4	0.2	



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810081  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

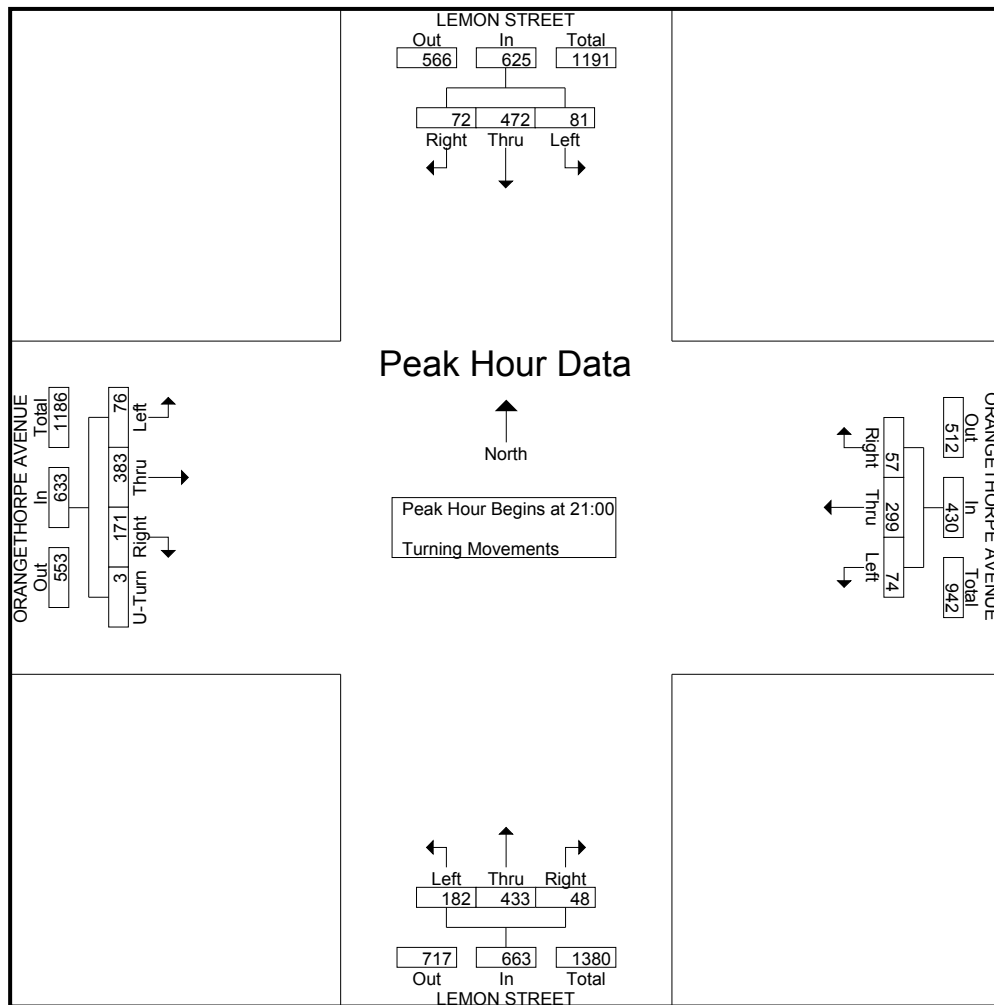
	LEMON STREET Southbound				ORANGETHORPE AVENUE Westbound				LEMON STREET Northbound				ORANGETHORPE AVENUE Eastbound						
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total	
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 18:00																			
18:00	37	206	56	299	26	211	49	286	34	227	66	327	51	180	42	2	275	1187	
18:15	33	154	37	224	27	204	66	297	37	229	69	335	45	181	52	3	281	1137	
18:30	34	163	30	227	40	166	43	249	27	214	58	299	38	187	58	0	283	1058	
18:45	34	166	40	240	42	185	44	271	25	178	69	272	42	162	38	2	244	1027	
Total Volume	138	689	163	990	135	766	202	1103	123	848	262	1233	176	710	190	7	1083	4409	
% App. Total	13.9	69.6	16.5		12.2	69.4	18.3		10	68.8	21.2		16.3	65.6	17.5	0.6			
PHF	.932	.836	.728	.828	.804	.908	.765	.928	.831	.926	.949	.920	.863	.949	.819	.583	.957	.929	



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: ORANGETHORPE AVENUE

File Name : H1810081  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				ORANGETHORPE AVENUE Westbound				LEMON STREET Northbound				ORANGETHORPE AVENUE Eastbound						
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total	
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 21:00																			
21:00	17	88	21	126	18	80	16	114	11	95	45	151	52	92	23	1	168	559	
21:15	22	121	18	161	12	80	20	112	10	109	57	176	56	107	21	2	186	635	
21:30	16	127	24	167	14	71	17	102	17	118	39	174	33	78	17	0	128	571	
21:45	17	136	18	171	13	68	21	102	10	111	41	162	30	106	15	0	151	586	
Total Volume	72	472	81	625	57	299	74	430	48	433	182	663	171	383	76	3	633	2351	
% App. Total	11.5	75.5	13		13.3	69.5	17.2		7.2	65.3	27.5		27	60.5	12	0.5			
PHF	.818	.868	.844	.914	.792	.934	.881	.943	.706	.917	.798	.942	.763	.895	.826	.375	.851	.926	



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : H1810082  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

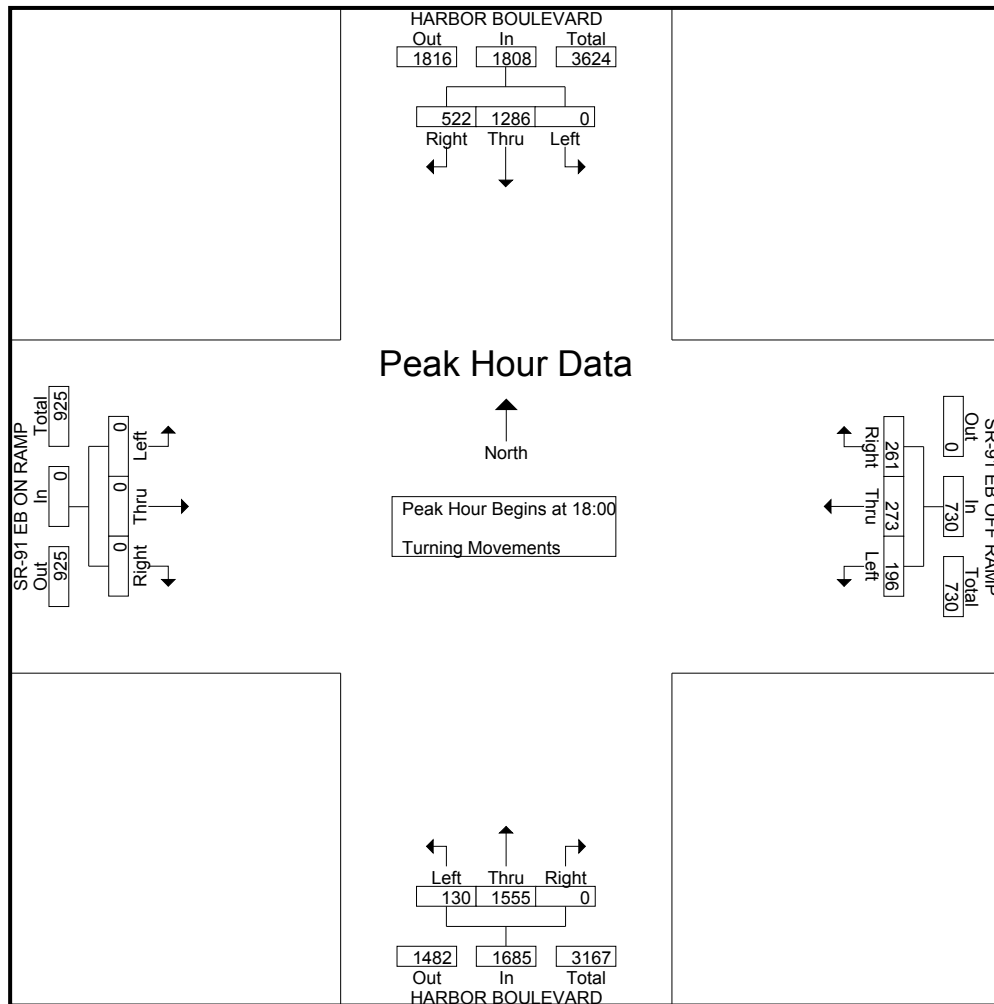
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			SR-91 EB OFF RAMP Westbound			HARBOR BOULEVARD Northbound			SR-91 EB ON RAMP Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	131	387	0	68	80	64	0	319	28	0	0	0	1077
18:15	126	301	0	81	65	50	0	417	36	0	0	0	1076
18:30	135	303	0	67	74	37	0	428	40	0	0	0	1084
18:45	130	295	0	45	54	45	0	391	26	0	0	0	986
Total	522	1286	0	261	273	196	0	1555	130	0	0	0	4223
19:00	138	304	0	68	75	48	0	378	23	0	0	0	1034
19:15	139	318	0	78	67	46	0	328	20	0	0	0	996
19:30	118	299	0	80	58	36	0	318	19	0	0	0	928
19:45	104	284	0	55	46	28	0	302	18	0	0	0	837
Total	499	1205	0	281	246	158	0	1326	80	0	0	0	3795
*** BREAK ***													
21:00	127	222	0	39	45	39	0	202	31	0	0	0	705
21:15	91	220	0	57	60	32	0	212	23	0	0	0	695
21:30	85	210	0	40	36	37	0	221	19	0	0	0	648
21:45	121	193	0	66	63	22	0	179	37	0	0	0	681
Total	424	845	0	202	204	130	0	814	110	0	0	0	2729
22:00	113	179	0	53	58	21	0	198	16	0	0	0	638
22:15	85	168	0	60	44	29	0	195	17	0	0	0	598
22:30	78	149	0	46	46	24	0	192	8	0	0	0	543
22:45	72	157	0	44	37	20	0	170	11	0	0	0	511
Total	348	653	0	203	185	94	0	755	52	0	0	0	2290
Grand Total	1793	3989	0	947	908	578	0	4450	372	0	0	0	13037
Apprch %	31	69	0	38.9	37.3	23.8	0	92.3	7.7	0	0	0	
Total %	13.8	30.6	0	7.3	7	4.4	0	34.1	2.9	0	0	0	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : H1810082  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

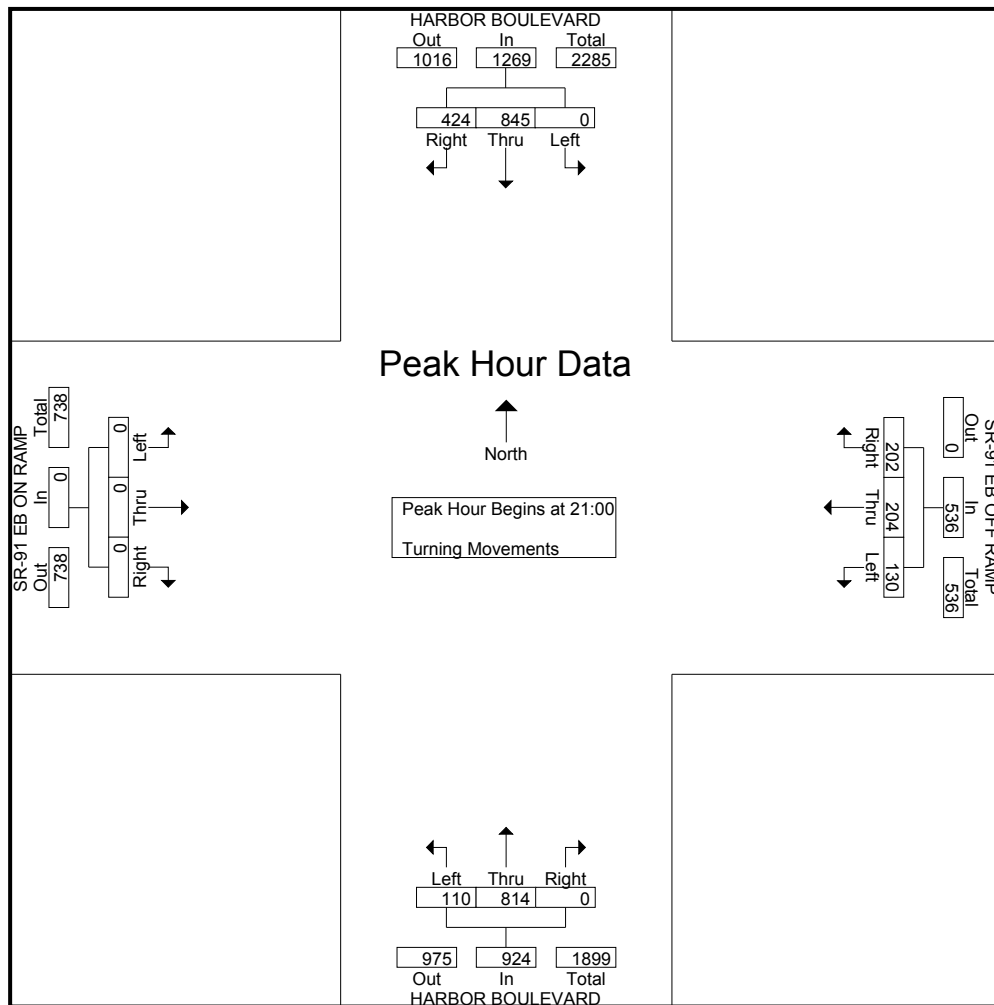
	HARBOR BOULEVARD Southbound				SR-91 EB OFF RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	131	387	0	518	68	80	64	212	0	319	28	347	0	0	0	0	1077
18:15	126	301	0	427	81	65	50	196	0	417	36	453	0	0	0	0	1076
18:30	135	303	0	438	67	74	37	178	0	428	40	468	0	0	0	0	1084
18:45	130	295	0	425	45	54	45	144	0	391	26	417	0	0	0	0	986
Total Volume	522	1286	0	1808	261	273	196	730	0	1555	130	1685	0	0	0	0	4223
% App. Total	28.9	71.1	0		35.8	37.4	26.8		0	92.3	7.7		0	0	0		
PHF	.967	.831	.000	.873	.806	.853	.766	.861	.000	.908	.813	.900	.000	.000	.000	.000	.974



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 WB RAMPS

File Name : H1810082  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				SR-91 EB OFF RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	127	222	0	349	39	45	39	123	0	202	31	233	0	0	0	0	705
21:15	91	220	0	311	57	60	32	149	0	212	23	235	0	0	0	0	695
21:30	85	210	0	295	40	36	37	113	0	221	19	240	0	0	0	0	648
21:45	121	193	0	314	66	63	22	151	0	179	37	216	0	0	0	0	681
Total Volume	424	845	0	1269	202	204	130	536	0	814	110	924	0	0	0	0	2729
% App. Total	33.4	66.6	0		37.7	38.1	24.3		0	88.1	11.9		0	0	0		
PHF	.835	.952	.000	.909	.765	.810	.833	.887	.000	.921	.743	.963	.000	.000	.000	.000	.968



City: FULLERON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1810083  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

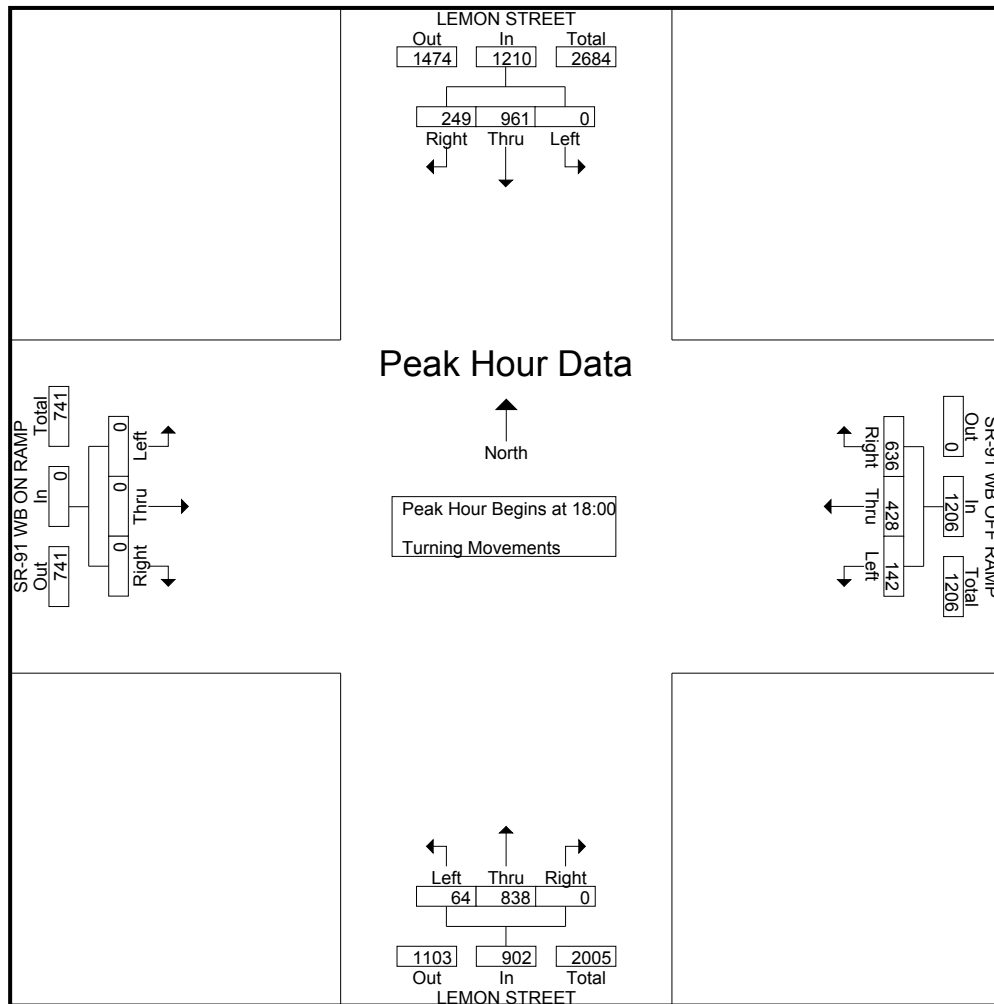
Groups Printed- Turning Movements

	LEMON STREET Southbound			SR-91 WB OFF RAMP Westbound			LEMON STREET Northbound			SR-91 WB ON RAMP Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	75	252	0	183	120	30	0	240	19	0	0	0	919
18:15	55	242	0	146	129	37	0	216	13	0	0	0	838
18:30	69	230	0	159	97	51	0	204	16	0	0	0	826
18:45	50	237	0	148	82	24	0	178	16	0	0	0	735
Total	249	961	0	636	428	142	0	838	64	0	0	0	3318
19:00	53	259	0	159	113	45	0	174	31	0	0	0	834
19:15	57	221	0	182	118	35	0	150	17	0	0	0	780
19:30	46	217	0	161	114	44	0	128	15	0	0	0	725
19:45	38	222	0	139	84	29	0	107	13	0	0	0	632
Total	194	919	0	641	429	153	0	559	76	0	0	0	2971
*** BREAK ***													
21:00	46	172	0	110	74	24	0	92	8	0	0	0	526
21:15	50	177	0	119	88	25	0	86	11	0	0	0	556
21:30	32	181	0	97	82	24	0	83	11	0	0	0	510
21:45	54	160	0	96	85	27	0	72	15	0	0	0	509
Total	182	690	0	422	329	100	0	333	45	0	0	0	2101
22:00	50	153	0	97	72	23	0	79	9	0	0	0	483
22:15	35	131	0	99	81	26	0	68	11	0	0	0	451
22:30	18	126	0	97	63	32	0	67	16	0	0	0	419
22:45	29	140	0	88	62	22	0	53	6	0	0	0	400
Total	132	550	0	381	278	103	0	267	42	0	0	0	1753
Grand Total	757	3120	0	2080	1464	498	0	1997	227	0	0	0	10143
Apprch %	19.5	80.5	0	51.5	36.2	12.3	0	89.8	10.2	0	0	0	
Total %	7.5	30.8	0	20.5	14.4	4.9	0	19.7	2.2	0	0	0	

City: FULLERON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1810083  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

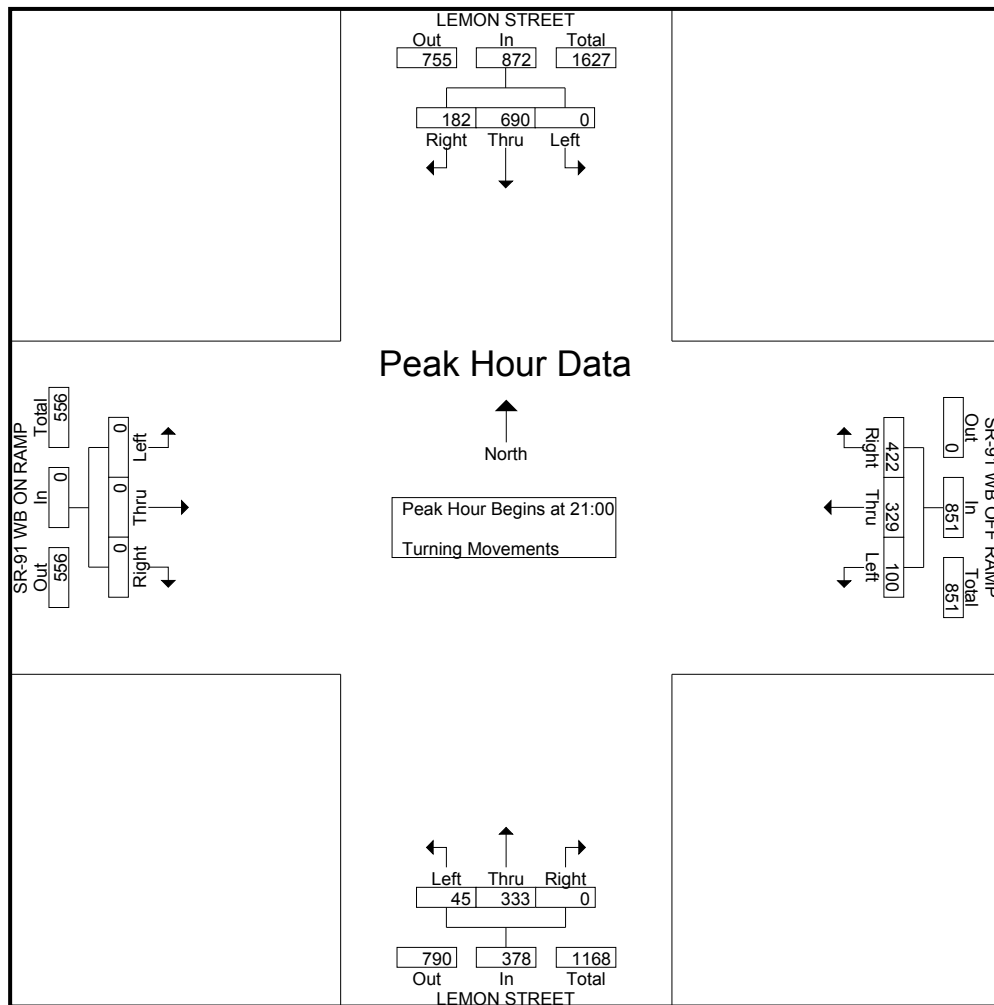
	LEMON STREET Southbound				SR-91 WB OFF RAMP Westbound				LEMON STREET Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	75	252	0	327	183	120	30	333	0	240	19	259	0	0	0	0	919
18:15	55	242	0	297	146	129	37	312	0	216	13	229	0	0	0	0	838
18:30	69	230	0	299	159	97	51	307	0	204	16	220	0	0	0	0	826
18:45	50	237	0	287	148	82	24	254	0	178	16	194	0	0	0	0	735
Total Volume	249	961	0	1210	636	428	142	1206	0	838	64	902	0	0	0	0	3318
% App. Total	20.6	79.4	0		52.7	35.5	11.8		0	92.9	7.1		0	0	0		
PHF	.830	.953	.000	.925	.869	.829	.696	.905	.000	.873	.842	.871	.000	.000	.000	.000	.903



City: FULLERON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 WB RAMPS

File Name : H1810083  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				SR-91 WB OFF RAMP Westbound				LEMON STREET Northbound				SR-91 WB ON RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	46	172	0	218	110	74	24	208	0	92	8	100	0	0	0	0	526
21:15	50	177	0	227	119	88	25	232	0	86	11	97	0	0	0	0	556
21:30	32	181	0	213	97	82	24	203	0	83	11	94	0	0	0	0	510
21:45	54	160	0	214	96	85	27	208	0	72	15	87	0	0	0	0	509
Total Volume	182	690	0	872	422	329	100	851	0	333	45	378	0	0	0	0	2101
% App. Total	20.9	79.1	0		49.6	38.7	11.8		0	88.1	11.9		0	0	0		
PHF	.843	.953	.000	.960	.887	.935	.926	.917	.000	.905	.750	.945	.000	.000	.000	.000	.945





City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1810084  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

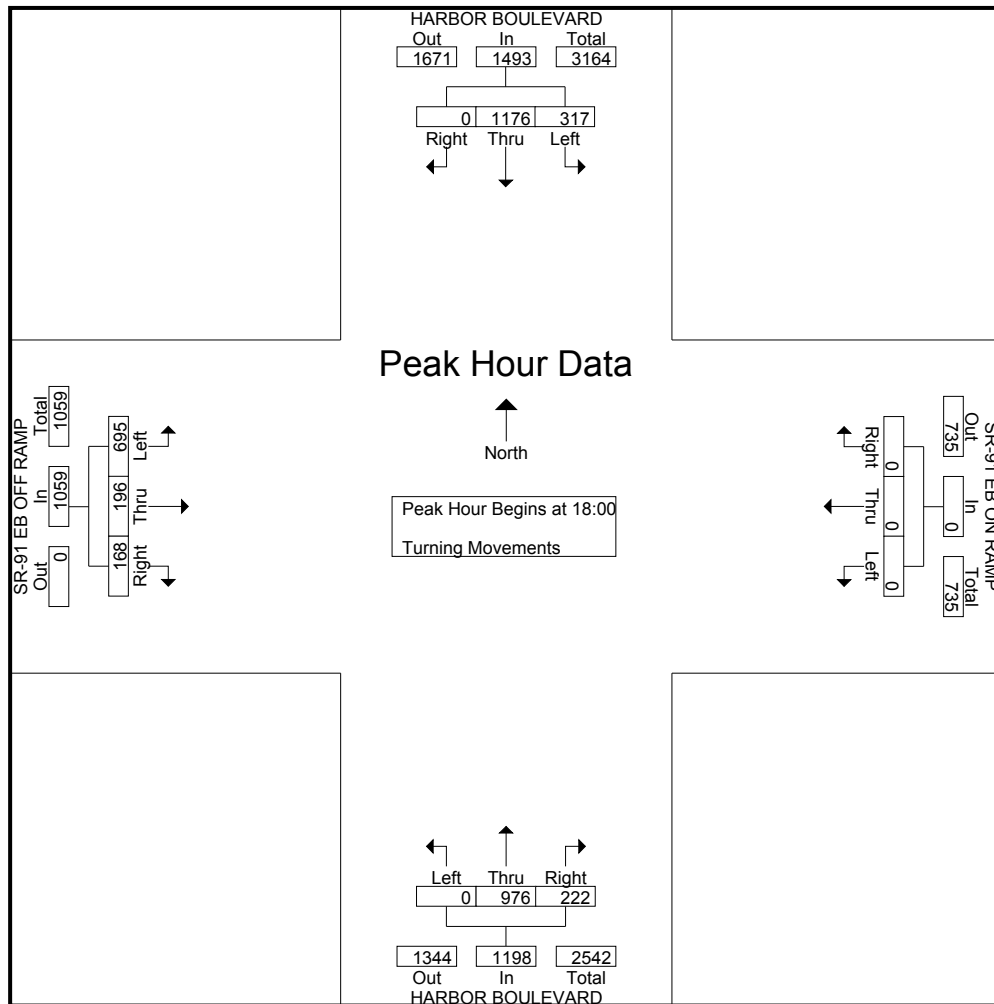
Groups Printed- Turning Movements

	HARBOR BOULEVARD Southbound			SR-91 EB ON RAMP Westbound			HARBOR BOULEVARD Northbound			SR-91 EB OFF RAMP Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	0	307	77	0	0	0	51	239	0	42	64	179	959
18:15	0	299	76	0	0	0	53	254	0	42	53	171	948
18:30	0	284	78	0	0	0	65	238	0	52	36	180	933
18:45	0	286	86	0	0	0	53	245	0	32	43	165	910
Total	0	1176	317	0	0	0	222	976	0	168	196	695	3750
19:00	0	256	91	0	0	0	56	254	0	50	45	128	880
19:15	0	257	95	0	0	0	55	194	0	37	54	140	832
19:30	0	230	106	0	0	0	42	190	0	27	27	152	774
19:45	0	225	89	0	0	0	48	199	0	37	37	121	756
Total	0	968	381	0	0	0	201	837	0	151	163	541	3242
*** BREAK ***													
21:00	0	178	81	0	0	0	43	123	0	27	37	106	595
21:15	0	175	72	0	0	0	40	121	0	43	30	110	591
21:30	0	178	70	0	0	0	37	136	0	35	24	115	595
21:45	0	152	71	0	0	0	44	133	0	29	31	85	545
Total	0	683	294	0	0	0	164	513	0	134	122	416	2326
22:00	0	128	67	0	0	0	35	108	0	27	30	105	500
22:15	0	121	76	0	0	0	29	112	0	25	29	102	494
22:30	0	126	42	0	0	0	31	97	0	28	32	98	454
22:45	0	116	55	0	0	0	42	95	0	19	29	87	443
Total	0	491	240	0	0	0	137	412	0	99	120	392	1891
Grand Total	0	3318	1232	0	0	0	724	2738	0	552	601	2044	11209
Apprch %	0	72.9	27.1	0	0	0	20.9	79.1	0	17.3	18.8	63.9	
Total %	0	29.6	11	0	0	0	6.5	24.4	0	4.9	5.4	18.2	

City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1810084  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

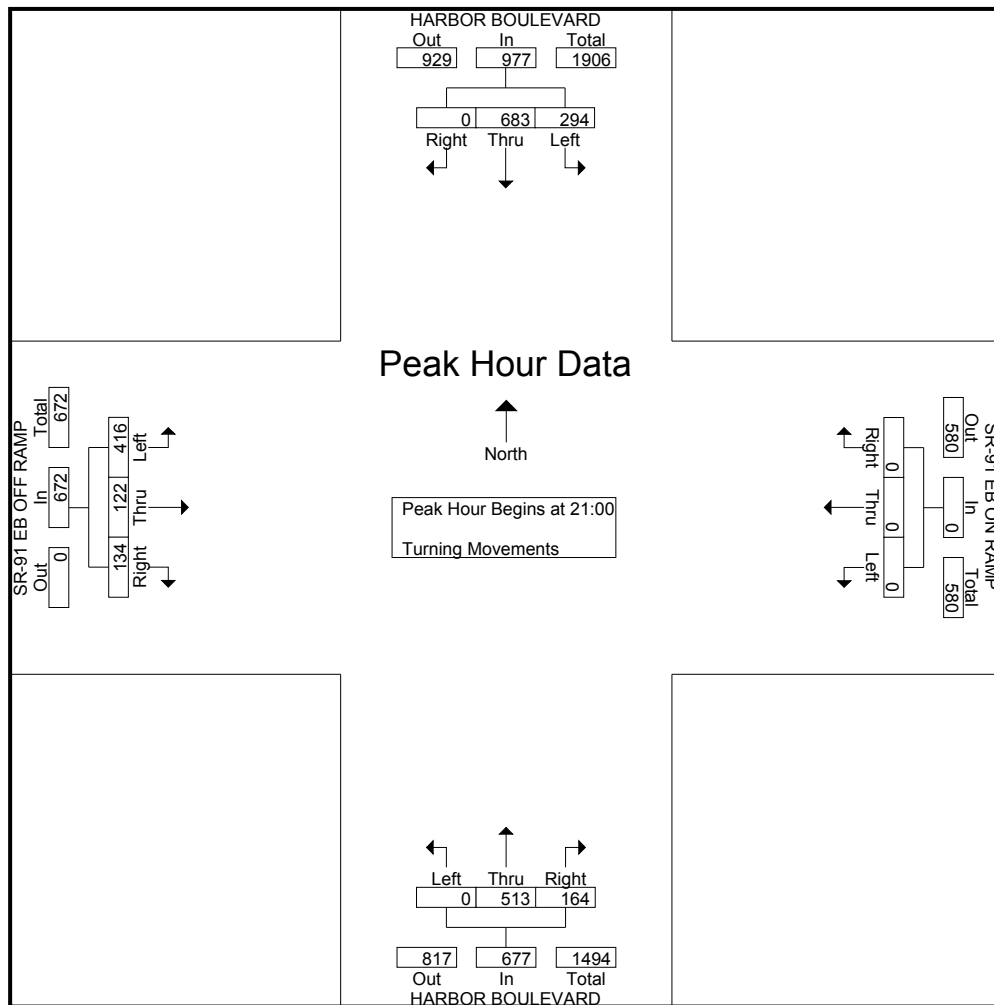
	HARBOR BOULEVARD Southbound				SR-91 EB ON RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	307	77	384	0	0	0	0	51	239	0	290	42	64	179	285	959
18:15	0	299	76	375	0	0	0	0	53	254	0	307	42	53	171	266	948
18:30	0	284	78	362	0	0	0	0	65	238	0	303	52	36	180	268	933
18:45	0	286	86	372	0	0	0	0	53	245	0	298	32	43	165	240	910
Total Volume	0	1176	317	1493	0	0	0	0	222	976	0	1198	168	196	695	1059	3750
% App. Total	0	78.8	21.2		0	0	0		18.5	81.5	0		15.9	18.5	65.6		
PHF	.000	.958	.922	.972	.000	.000	.000	.000	.854	.961	.000	.976	.808	.766	.965	.929	.978



City: FULLERTON  
N-S Direction: HARBOR BOULEVARD  
E-W Direction: SR-91 EB RAMPS

File Name : H1810084  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	HARBOR BOULEVARD Southbound				SR-91 EB ON RAMP Westbound				HARBOR BOULEVARD Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	0	178	81	259	0	0	0	0	43	123	0	166	27	37	106	170	595
21:15	0	175	72	247	0	0	0	0	40	121	0	161	43	30	110	183	591
21:30	0	178	70	248	0	0	0	0	37	136	0	173	35	24	115	174	595
21:45	0	152	71	223	0	0	0	0	44	133	0	177	29	31	85	145	545
Total Volume	0	683	294	977	0	0	0	0	164	513	0	677	134	122	416	672	2326
% App. Total	0	69.9	30.1		0	0	0		24.2	75.8	0		19.9	18.2	61.9		
PHF	.000	.959	.907	.943	.000	.000	.000	.000	.932	.943	.000	.956	.779	.824	.904	.918	.977



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1810085  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 1

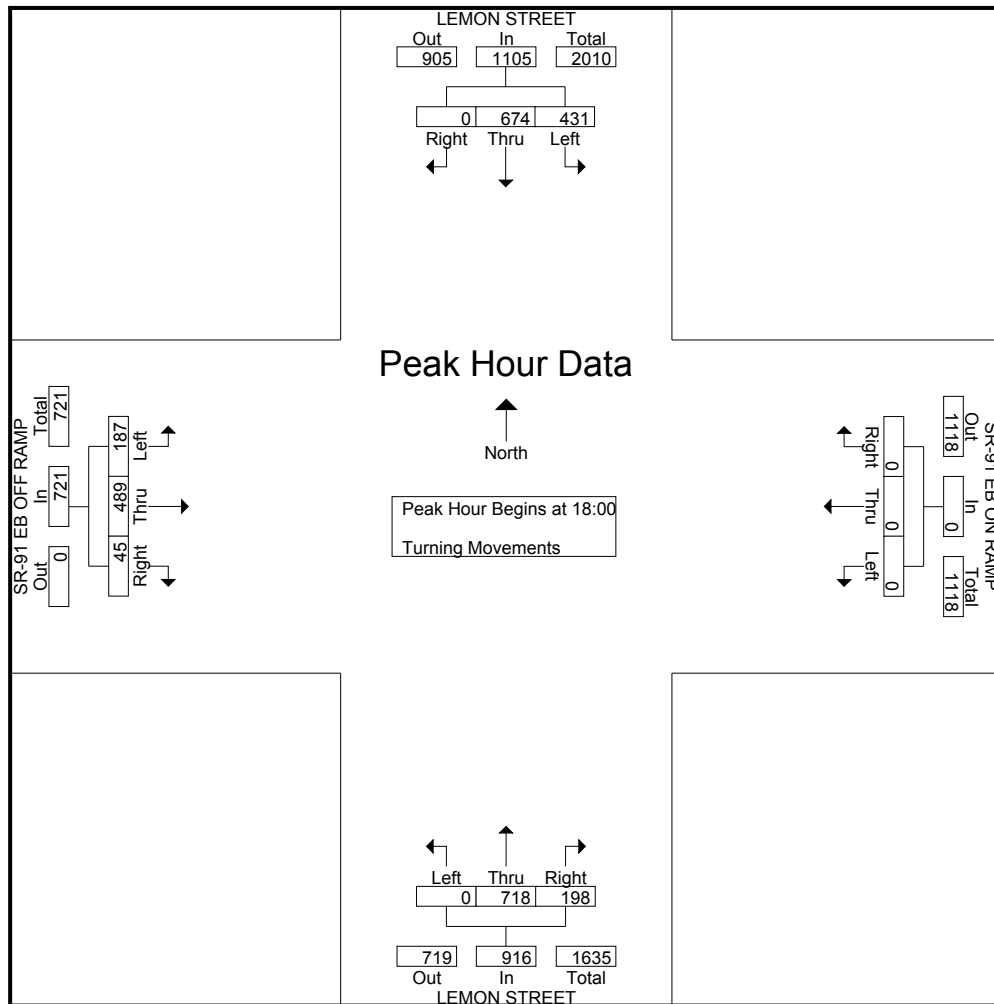
Groups Printed- Turning Movements

Start Time	LEMON STREET Southbound			SR-91 EB ON RAMP Westbound			LEMON STREET Northbound			SR-91 EB OFF RAMP Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	0	175	117	0	0	0	47	206	0	12	104	49	710
18:15	0	162	105	0	0	0	50	173	0	13	129	55	687
18:30	0	180	95	0	0	0	64	185	0	10	123	45	702
18:45	0	157	114	0	0	0	37	154	0	10	133	38	643
Total	0	674	431	0	0	0	198	718	0	45	489	187	2742
19:00	0	188	115	0	0	0	40	156	0	12	152	36	699
19:15	0	144	116	0	0	0	35	127	0	24	135	45	626
19:30	0	146	120	0	0	0	40	119	0	11	160	31	627
19:45	0	135	105	0	0	0	36	94	0	24	163	35	592
Total	0	613	456	0	0	0	151	496	0	71	610	147	2544
*** BREAK ***													
21:00	0	108	94	0	0	0	29	67	0	8	117	33	456
21:15	0	128	81	0	0	0	50	69	0	12	122	26	488
21:30	0	111	93	0	0	0	50	67	0	9	112	29	471
21:45	0	88	94	0	0	0	41	65	0	7	115	24	434
Total	0	435	362	0	0	0	170	268	0	36	466	112	1849
22:00	0	95	91	0	0	0	31	61	0	11	84	23	396
22:15	0	74	84	0	0	0	22	49	0	12	124	31	396
22:30	0	87	75	0	0	0	25	53	0	2	72	29	343
22:45	0	70	63	0	0	0	25	30	0	5	108	26	327
Total	0	326	313	0	0	0	103	193	0	30	388	109	1462
Grand Total	0	2048	1562	0	0	0	622	1675	0	182	1953	555	8597
Apprch %	0	56.7	43.3	0	0	0	27.1	72.9	0	6.8	72.6	20.6	
Total %	0	23.8	18.2	0	0	0	7.2	19.5	0	2.1	22.7	6.5	

City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1810085  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 2

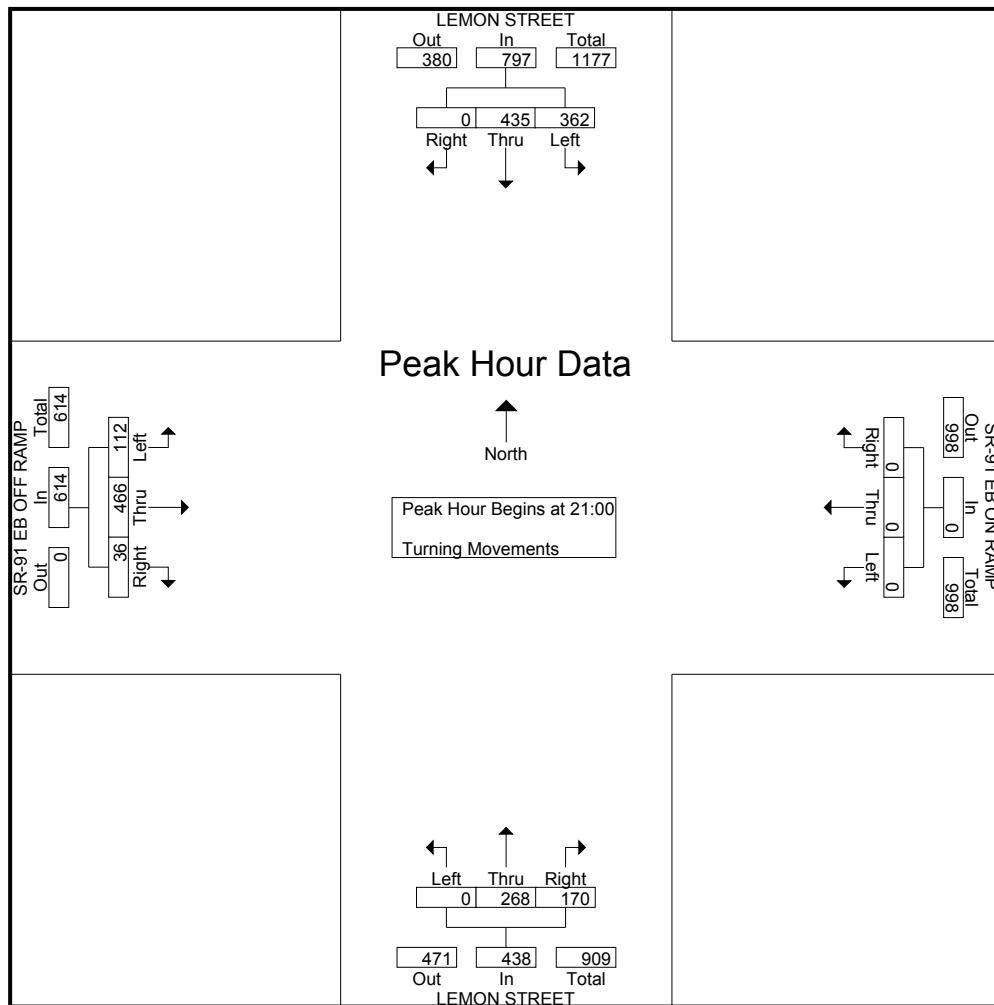
	LEMON STREET Southbound				SR-91 EB ON RAMP Westbound				LEMON STREET Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	175	117	292	0	0	0	0	47	206	0	253	12	104	49	165	710
18:15	0	162	105	267	0	0	0	0	50	173	0	223	13	129	55	197	687
18:30	0	180	95	275	0	0	0	0	64	185	0	249	10	123	45	178	702
18:45	0	157	114	271	0	0	0	0	37	154	0	191	10	133	38	181	643
Total Volume	0	674	431	1105	0	0	0	0	198	718	0	916	45	489	187	721	2742
% App. Total	0	61	39		0	0	0		21.6	78.4	0		6.2	67.8	25.9		
PHF	.000	.936	.921	.946	.000	.000	.000	.000	.773	.871	.000	.905	.865	.919	.850	.915	.965



City: FULLERTON  
N-S Direction: LEMON STREET  
E-W Direction: SR-91 EB RAMPS

File Name : H1810085  
Site Code : 00000000  
Start Date : 10/26/2018  
Page No : 3

	LEMON STREET Southbound				SR-91 EB ON RAMP Westbound				LEMON STREET Northbound				SR-91 EB OFF RAMP Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:00																	
21:00	0	108	94	202	0	0	0	0	29	67	0	96	8	117	33	158	456
21:15	0	128	81	209	0	0	0	0	50	69	0	119	12	122	26	160	488
21:30	0	111	93	204	0	0	0	0	50	67	0	117	9	112	29	150	471
21:45	0	88	94	182	0	0	0	0	41	65	0	106	7	115	24	146	434
Total Volume	0	435	362	797	0	0	0	0	170	268	0	438	36	466	112	614	1849
% App. Total	0	54.6	45.4		0	0	0		38.8	61.2	0		5.9	75.9	18.2		
PHF	.000	.850	.963	.953	.000	.000	.000	.000	.850	.971	.000	.920	.750	.955	.848	.959	.947



CITY: FULLERTON  
N/S: CENTENNIAL WAY  
E/W: BERKELEY AVENUE

File Name : H1810086  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

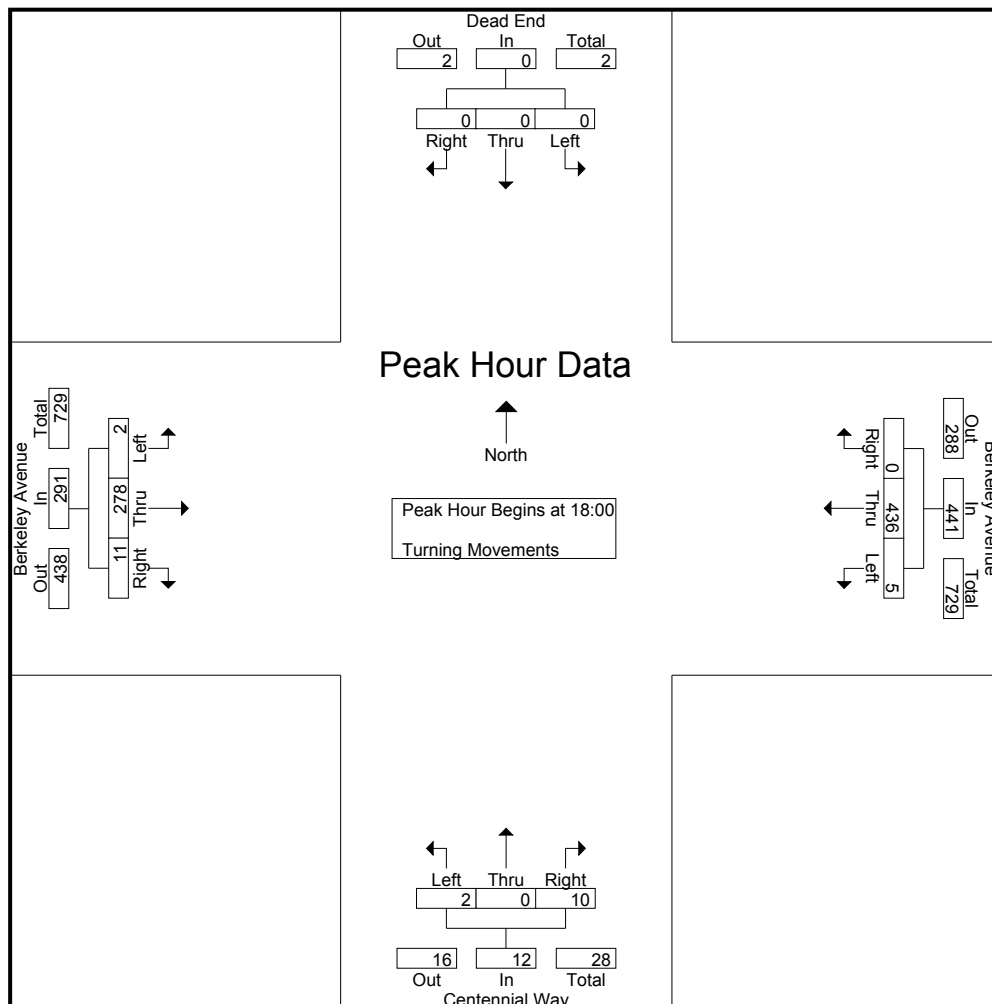
Groups Printed- Turning Movements

	Dead End Southbound			Berkeley Avenue Westbound			Centennial Way Northbound			Berkeley Avenue Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	0	0	0	0	128	2	5	0	0	2	75	0	212
18:15	0	0	0	0	99	1	2	0	1	2	64	0	169
18:30	0	0	0	0	100	0	1	0	1	7	74	0	183
18:45	0	0	0	0	109	2	2	0	0	0	65	2	180
Total	0	0	0	0	436	5	10	0	2	11	278	2	744
19:00	0	0	0	0	60	1	2	0	2	2	66	0	133
19:15	0	0	0	0	58	0	2	0	0	2	49	1	112
19:30	0	0	0	0	58	0	0	0	0	2	54	0	114
19:45	0	0	0	0	54	0	0	0	1	1	52	0	108
Total	0	0	0	0	230	1	4	0	3	7	221	1	467
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	45	0	0	0	1	1	34	0	81
21:15	0	0	0	0	48	0	0	0	1	1	32	0	82
21:30	0	0	0	0	49	0	3	0	0	0	33	0	85
21:45	0	0	0	0	45	0	4	0	3	1	54	1	108
Total	0	0	0	0	187	0	7	0	5	3	153	1	356
22:00	0	0	0	0	50	0	1	0	0	1	83	0	135
22:15	0	0	0	0	40	0	0	0	0	0	69	0	109
22:30	0	0	0	0	28	0	0	0	0	0	28	0	56
22:45	0	0	0	0	27	0	0	0	0	0	18	0	45
Total	0	0	0	0	145	0	1	0	0	1	198	0	345
Grand Total	0	0	0	0	998	6	22	0	10	22	850	4	1912
Apprch %	0	0	0	0	99.4	0.6	68.8	0	31.2	2.5	97	0.5	
Total %	0	0	0	0	52.2	0.3	1.2	0	0.5	1.2	44.5	0.2	

CITY: FULLERTON  
N/S: CENTENNIAL WAY  
E/W: BERKELEY AVENUE

File Name : H1810086  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

	Dead End Southbound				Berkeley Avenue Westbound				Centennial Way Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	0	0	0	0	128	2	130	5	0	0	5	2	75	0	77	212
18:15	0	0	0	0	0	99	1	100	2	0	1	3	2	64	0	66	169
18:30	0	0	0	0	0	100	0	100	1	0	1	2	7	74	0	81	183
18:45	0	0	0	0	0	109	2	111	2	0	0	2	0	65	2	67	180
Total Volume	0	0	0	0	0	436	5	441	10	0	2	12	11	278	2	291	744
% App. Total	0	0	0		0	98.9	1.1		83.3	0	16.7		3.8	95.5	0.7		
PHF	.000	.000	.000	.000	.000	.852	.625	.848	.500	.000	.500	.600	.393	.927	.250	.898	.877

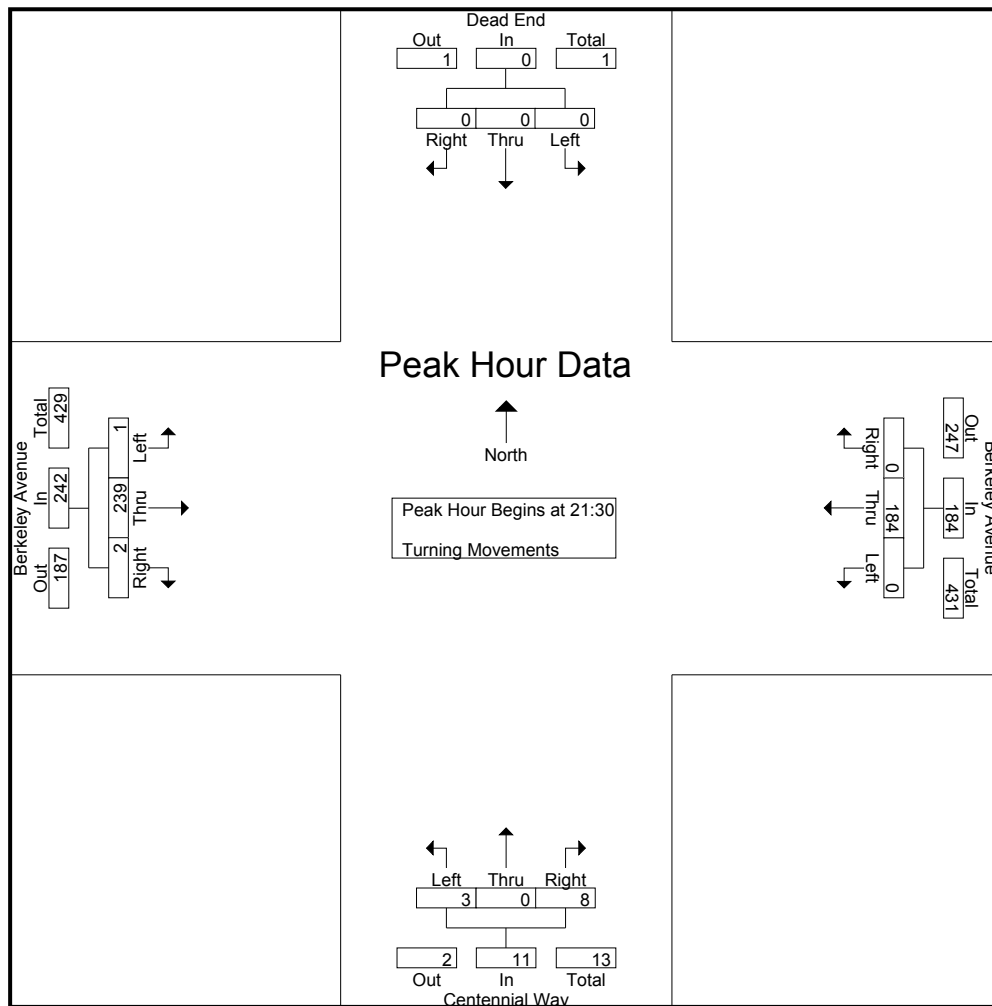




CITY: FULLERTON  
N/S: CENTENNIAL WAY  
E/W: BERKELEY AVENUE

File Name : H1810086  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Dead End Southbound				Berkeley Avenue Westbound				Centennial Way Northbound				Berkeley Avenue Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	0	0	0	0	0	49	0	49	3	0	0	3	0	33	0	33	85
21:45	0	0	0	0	0	45	0	45	4	0	3	7	1	54	1	56	108
22:00	0	0	0	0	0	50	0	50	1	0	0	1	1	83	0	84	135
22:15	0	0	0	0	0	40	0	40	0	0	0	0	0	69	0	69	109
Total Volume	0	0	0	0	0	184	0	184	8	0	3	11	2	239	1	242	437
% App. Total	0	0	0	0	0	100	0	100	72.7	0	27.3	11	0.8	98.8	0.4	100	100
PHF	.000	.000	.000	.000	.000	.920	.000	.920	.500	.000	.250	.393	.500	.720	.250	.720	.809



CITY: FULLERTON  
N/S: LEMON STREET  
E/W: FULLERTON COLLEGE DRIVE

File Name : H1810087  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

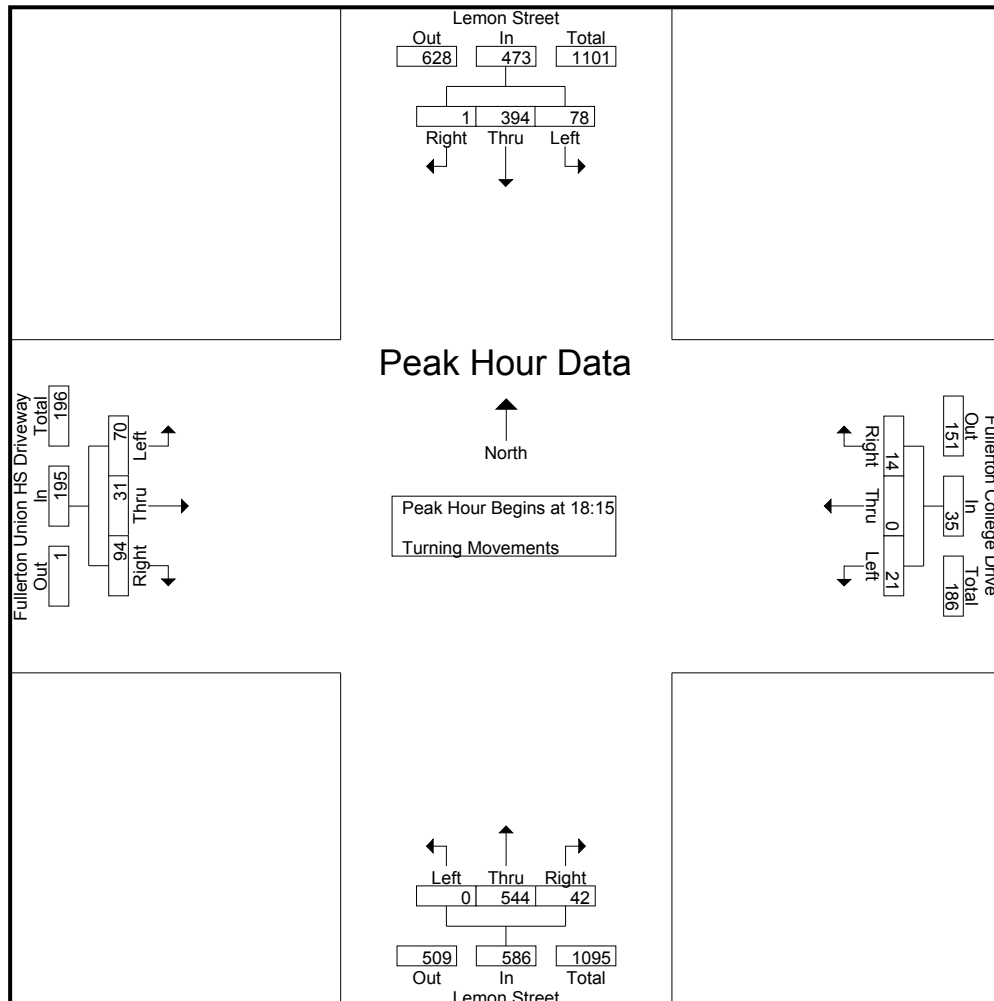
Groups Printed- Turning Movements

	Lemon Street Southbound			Fullerton College Drive Westbound			Lemon Street Northbound			Fullerton Union HS Driveway Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	0	97	8	4	0	3	9	160	0	11	4	20	316
18:15	0	93	7	4	0	8	11	149	0	18	11	10	311
18:30	1	95	16	4	0	4	10	140	0	25	9	14	318
18:45	0	96	31	4	0	5	11	138	0	27	5	26	343
Total	1	381	62	16	0	20	41	587	0	81	29	70	1288
19:00	0	110	24	2	0	4	10	117	0	24	6	20	317
19:15	0	66	12	4	0	6	6	104	2	14	6	7	227
19:30	0	67	7	3	0	4	2	79	0	9	2	5	178
19:45	0	41	3	5	0	2	3	88	0	3	1	2	148
Total	0	284	46	14	0	16	21	388	2	50	15	34	870
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	36	1	1	0	12	4	58	0	10	0	2	124
21:15	0	35	3	2	0	7	3	60	1	6	0	8	125
21:30	0	41	2	3	0	12	1	67	0	16	1	15	158
21:45	0	66	7	9	0	10	5	67	0	20	0	12	196
Total	0	178	13	15	0	41	13	252	1	52	1	37	603
22:00	0	92	6	8	0	22	4	81	0	36	0	20	269
22:15	0	69	4	5	0	21	0	49	0	52	0	23	223
22:30	1	38	1	2	0	9	4	40	0	42	0	11	148
22:45	0	24	0	0	0	0	0	34	0	2	0	0	60
Total	1	223	11	15	0	52	8	204	0	132	0	54	700
Grand Total	2	1066	132	60	0	129	83	1431	3	315	45	195	3461
Apprch %	0.2	88.8	11	31.7	0	68.3	5.5	94.3	0.2	56.8	8.1	35.1	
Total %	0.1	30.8	3.8	1.7	0	3.7	2.4	41.3	0.1	9.1	1.3	5.6	

CITY: FULLERTON  
N/S: LEMON STREET  
E/W: FULLERTON COLLEGE DRIVE

File Name : H1810087  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

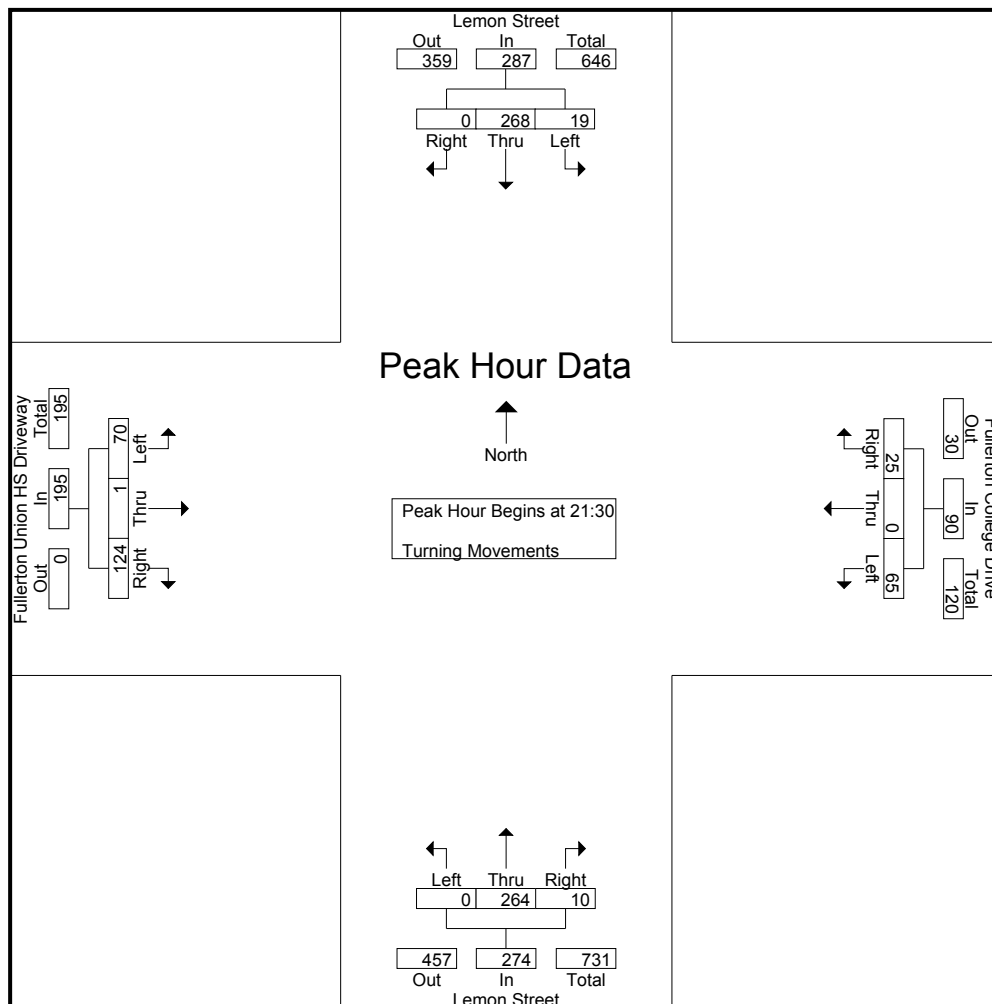
	Lemon Street Southbound				Fullerton College Drive Westbound				Lemon Street Northbound				Fullerton Union HS Driveway Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:15																	
18:15	0	93	7	100	4	0	8	12	11	149	0	160	18	11	10	39	311
18:30	1	95	16	112	4	0	4	8	10	140	0	150	25	9	14	48	318
18:45	0	96	31	127	4	0	5	9	11	138	0	149	27	5	26	58	343
19:00	0	110	24	134	2	0	4	6	10	117	0	127	24	6	20	50	317
Total Volume	1	394	78	473	14	0	21	35	42	544	0	586	94	31	70	195	1289
% App. Total	0.2	83.3	16.5		40	0	60		7.2	92.8	0		48.2	15.9	35.9		
PHF	.250	.895	.629	.882	.875	.000	.656	.729	.955	.913	.000	.916	.870	.705	.673	.841	.940



CITY: FULLERTON  
N/S: LEMON STREET  
E/W: FULLERTON COLLEGE DRIVE

File Name : H1810087  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Lemon Street Southbound				Fullerton College Drive Westbound				Lemon Street Northbound				Fullerton Union HS Driveway Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	0	41	2	43	3	0	12	15	1	67	0	68	16	1	15	32	158
21:45	0	66	7	73	9	0	10	19	5	67	0	72	20	0	12	32	196
22:00	0	92	6	98	8	0	22	30	4	81	0	85	36	0	20	56	269
22:15	0	69	4	73	5	0	21	26	0	49	0	49	52	0	23	75	223
Total Volume	0	268	19	287	25	0	65	90	10	264	0	274	124	1	70	195	846
% App. Total	0	93.4	6.6		27.8	0	72.2		3.6	96.4	0		63.6	0.5	35.9		
PHF	.000	.728	.679	.732	.694	.000	.739	.750	.500	.815	.000	.806	.596	.250	.761	.650	.786



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 1

File Name : H1810088  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

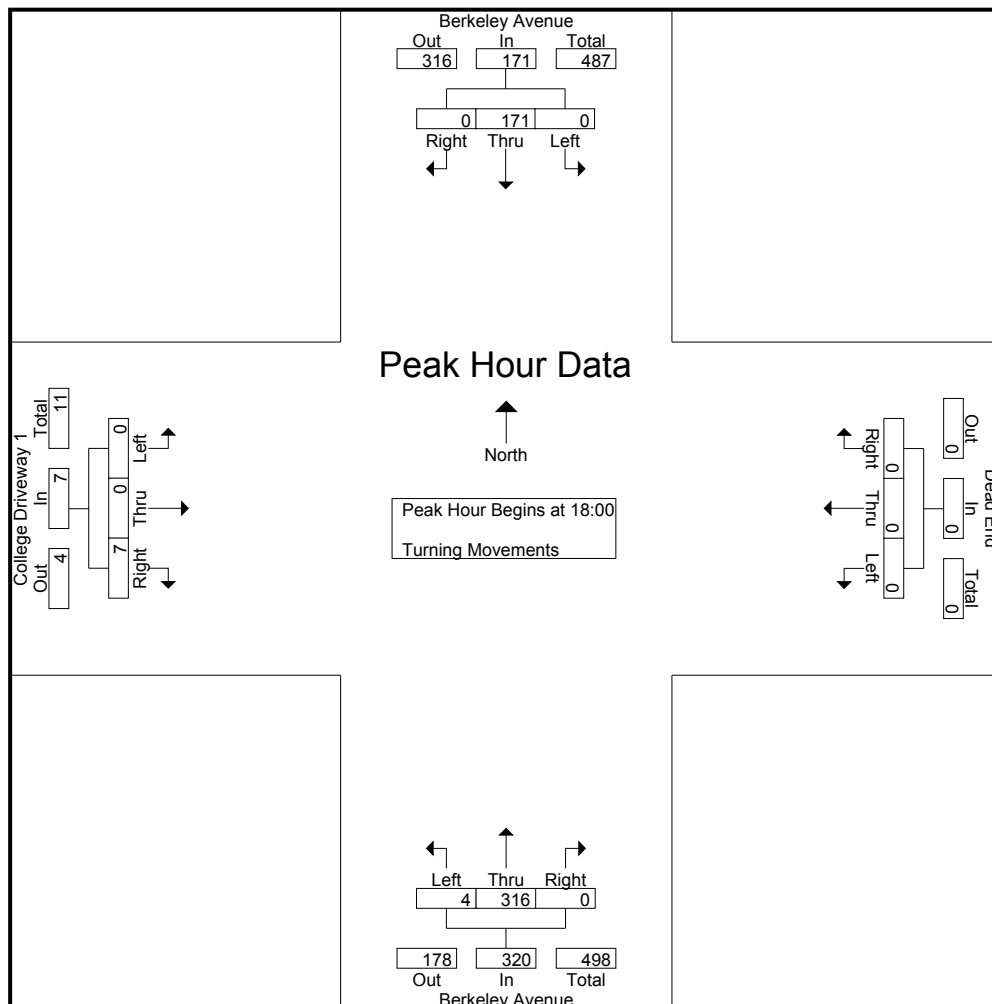
Groups Printed- Turning Movements

	Berkeley Avenue Southbound			Dead End Westbound			Berkeley Avenue Northbound			College Driveway 1 Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	0	58	0	0	0	0	0	96	1	1	0	0	156
18:15	0	35	0	0	0	0	0	74	2	3	0	0	114
18:30	0	48	0	0	0	0	0	68	0	1	0	0	117
18:45	0	30	0	0	0	0	0	78	1	2	0	0	111
Total	0	171	0	0	0	0	0	316	4	7	0	0	498
19:00	0	47	1	0	0	0	0	40	1	0	0	0	89
19:15	0	31	0	0	0	0	0	32	0	1	0	0	64
19:30	0	29	0	0	0	0	0	46	0	0	0	0	75
19:45	0	36	0	0	0	0	0	41	0	0	0	0	77
Total	0	143	1	0	0	0	0	159	1	1	0	0	305
21:00	0	16	0	0	0	0	0	31	0	0	0	0	47
21:15	0	21	0	0	0	0	0	29	0	0	0	0	50
21:30	0	26	0	0	0	0	0	43	0	0	0	0	69
21:45	0	31	0	0	0	0	0	24	0	0	0	0	55
Total	0	94	0	0	0	0	0	127	0	0	0	0	221
22:00	0	53	0	0	0	0	0	33	0	0	0	0	86
22:15	0	30	0	0	0	0	0	24	0	0	0	0	54
22:30	0	22	0	0	0	0	0	23	0	0	0	0	45
22:45	0	14	0	0	0	0	0	20	0	0	0	0	34
Total	0	119	0	0	0	0	0	100	0	0	0	0	219
Grand Total	0	527	1	0	0	0	0	702	5	8	0	0	1243
Apprch %	0	99.8	0.2	0	0	0	0	99.3	0.7	100	0	0	
Total %	0	42.4	0.1	0	0	0	0	56.5	0.4	0.6	0	0	

CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 1

File Name : H1810088  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

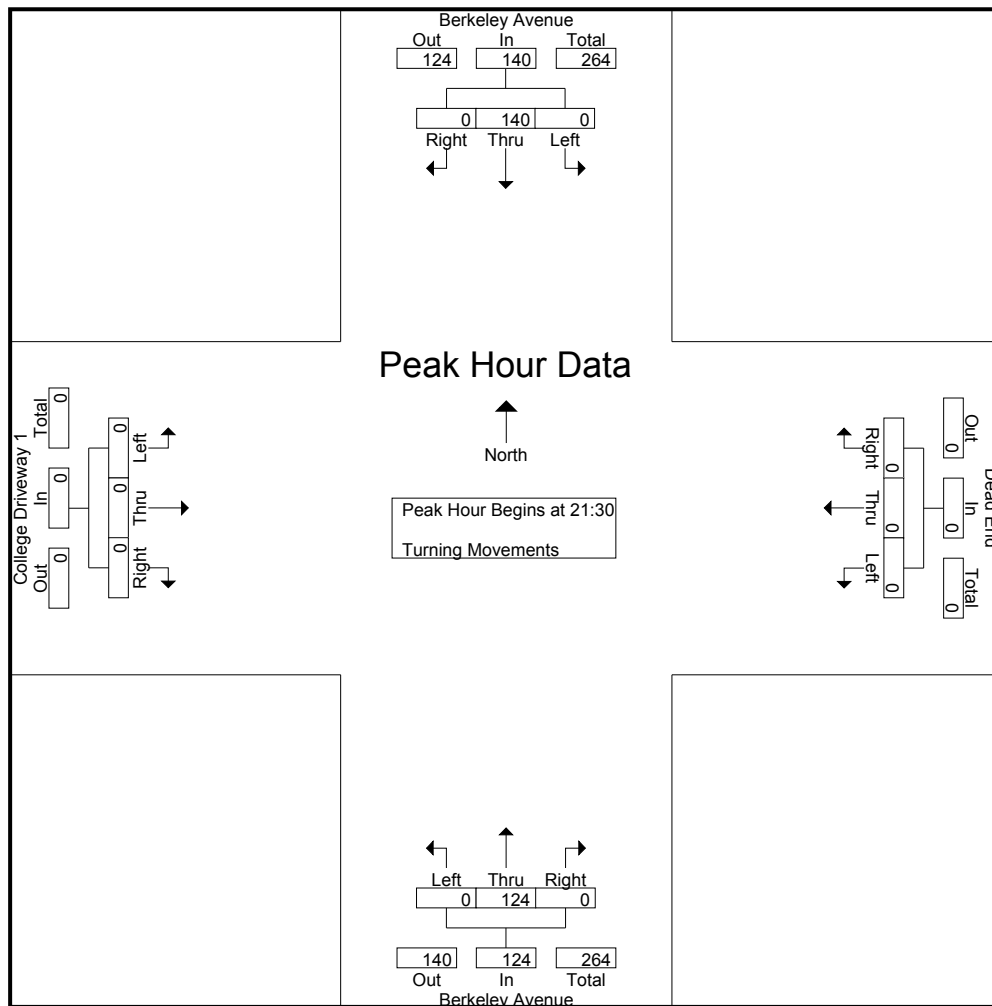
	Berkeley Avenue Southbound				Dead End Westbound				Berkeley Avenue Northbound				College Driveway 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	58	0	58	0	0	0	0	0	96	1	97	1	0	0	1	156
18:15	0	35	0	35	0	0	0	0	0	74	2	76	3	0	0	3	114
18:30	0	48	0	48	0	0	0	0	0	68	0	68	1	0	0	1	117
18:45	0	30	0	30	0	0	0	0	0	78	1	79	2	0	0	2	111
Total Volume	0	171	0	171	0	0	0	0	0	316	4	320	7	0	0	7	498
% App. Total	0	100	0		0	0	0		0	98.8	1.2		100	0	0		
PHF	.000	.737	.000	.737	.000	.000	.000	.000	.000	.823	.500	.825	.583	.000	.000	.583	.798



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 1

File Name : H1810088  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Berkeley Avenue Southbound				Dead End Westbound				Berkeley Avenue Northbound				College Driveway 1 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	0	26	0	26	0	0	0	0	0	43	0	43	0	0	0	0	69
21:45	0	31	0	31	0	0	0	0	0	24	0	24	0	0	0	0	55
22:00	0	53	0	53	0	0	0	0	0	33	0	33	0	0	0	0	86
22:15	0	30	0	30	0	0	0	0	0	24	0	24	0	0	0	0	54
Total Volume	0	140	0	140	0	0	0	0	0	124	0	124	0	0	0	0	264
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.660	.000	.660	.000	.000	.000	.000	.000	.721	.000	.721	.000	.000	.000	.000	.767



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 2

File Name : H1810089  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

Groups Printed- Turning Movements

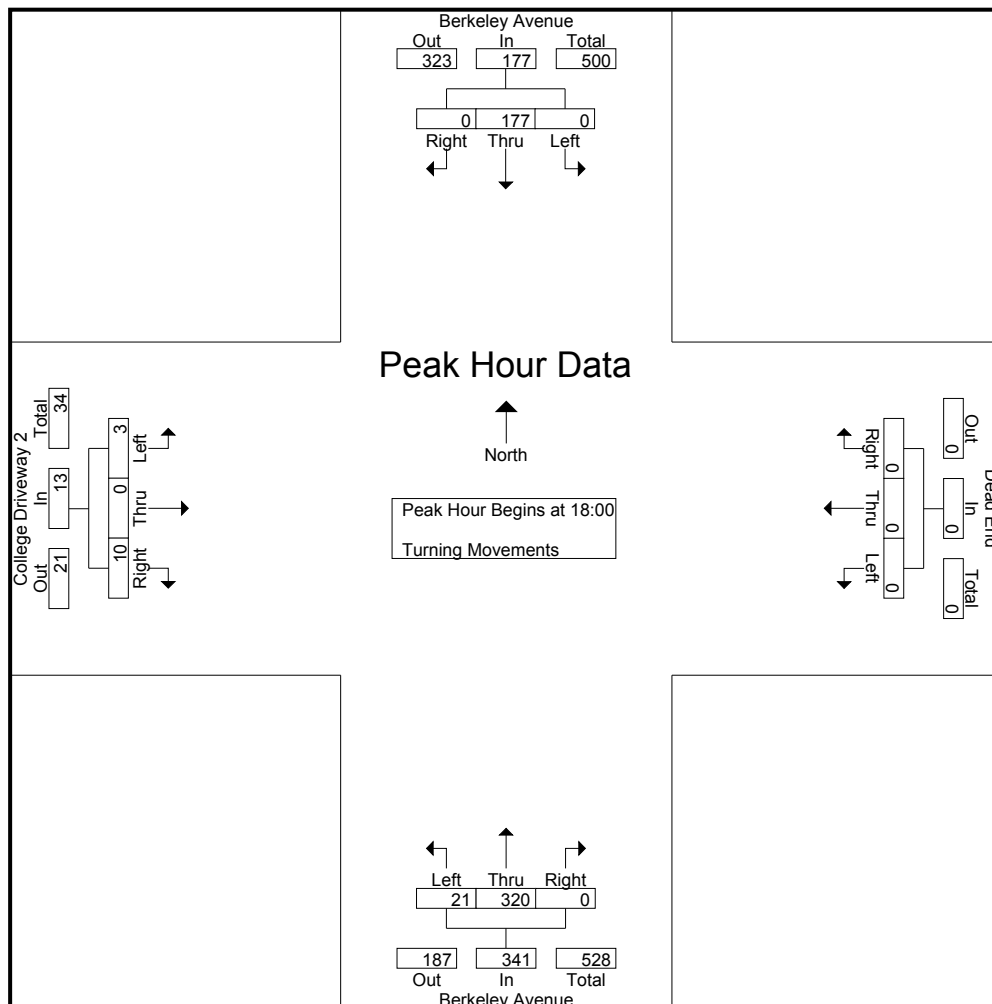
	Berkeley Avenue Southbound			Dead End Westbound			Berkeley Avenue Northbound			College Driveway 2 Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	0	59	0	0	0	0	0	99	12	5	0	0	175
18:15	0	37	0	0	0	0	0	76	5	3	0	0	121
18:30	0	50	0	0	0	0	0	64	2	2	0	3	121
18:45	0	31	0	0	0	0	0	81	2	0	0	0	114
Total	0	177	0	0	0	0	0	320	21	10	0	3	531
19:00	1	46	0	0	0	0	0	41	2	2	0	0	92
19:15	0	32	0	0	0	0	0	32	0	2	0	1	67
19:30	0	29	0	0	0	0	0	43	1	2	0	1	76
19:45	0	34	0	0	0	0	0	43	0	1	0	0	78
Total	1	141	0	0	0	0	0	159	3	7	0	2	313
21:00	0	18	0	0	0	0	0	30	0	4	0	0	52
21:15	0	22	0	0	0	0	0	30	1	3	0	0	56
21:30	0	25	0	0	0	0	0	42	1	0	0	0	68
21:45	0	31	0	0	0	0	0	24	2	2	0	0	59
Total	0	96	0	0	0	0	0	126	4	9	0	0	235
22:00	0	54	0	0	0	0	0	30	0	6	0	0	90
22:15	0	29	0	0	0	0	0	24	1	1	0	0	55
22:30	0	23	0	0	0	0	0	23	0	2	0	0	48
22:45	0	14	0	0	0	0	0	20	0	0	0	0	34
Total	0	120	0	0	0	0	0	97	1	9	0	0	227
Grand Total	1	534	0	0	0	0	0	702	29	35	0	5	1306
Apprch %	0.2	99.8	0	0	0	0	0	96	4	87.5	0	12.5	
Total %	0.1	40.9	0	0	0	0	0	53.8	2.2	2.7	0	0.4	



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 2

File Name : H1810089  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

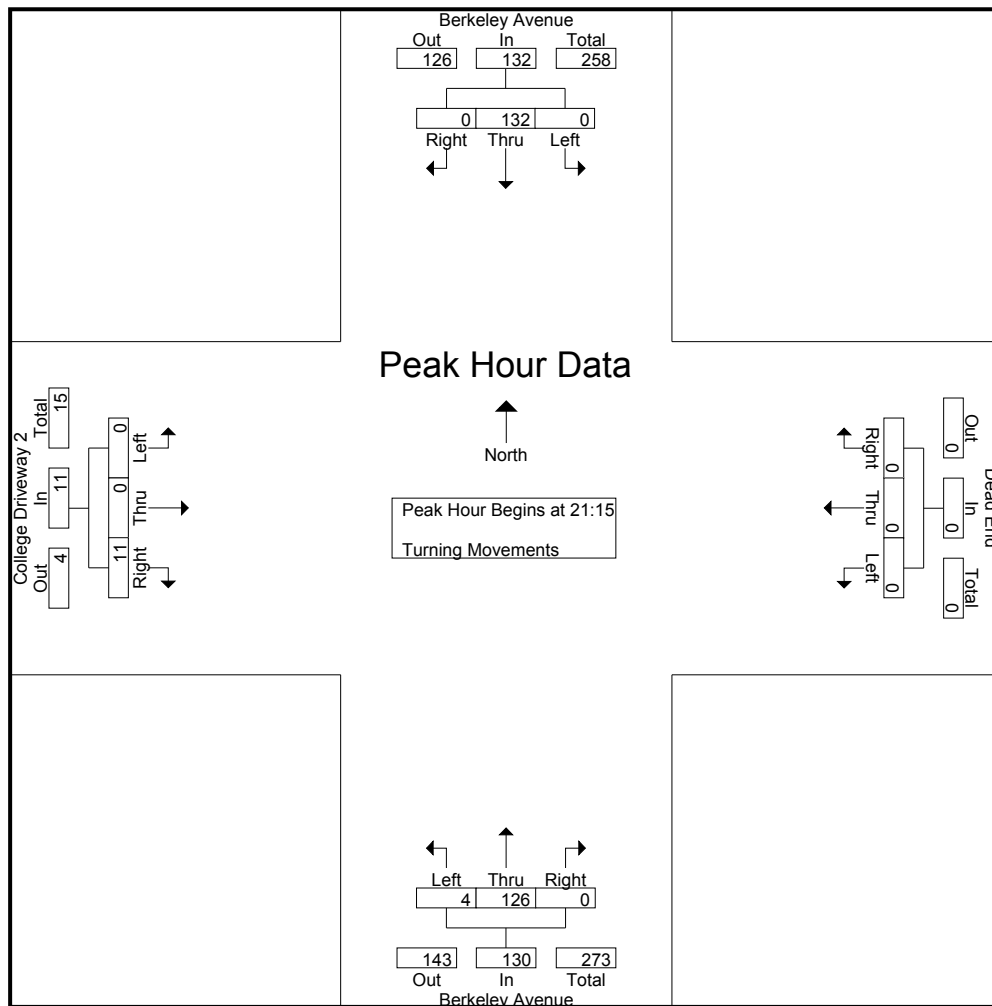
	Berkeley Avenue Southbound				Dead End Westbound				Berkeley Avenue Northbound				College Driveway 2 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	59	0	59	0	0	0	0	0	99	12	111	5	0	0	5	175
18:15	0	37	0	37	0	0	0	0	0	76	5	81	3	0	0	3	121
18:30	0	50	0	50	0	0	0	0	0	64	2	66	2	0	3	5	121
18:45	0	31	0	31	0	0	0	0	0	81	2	83	0	0	0	0	114
Total Volume	0	177	0	177	0	0	0	0	0	320	21	341	10	0	3	13	531
% App. Total	0	100	0		0	0	0		0	93.8	6.2		76.9	0	23.1		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.808	.438	.768	.500	.000	.250	.650	.759



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: COLLEGE DRIVEWAY 2

File Name : H1810089  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Berkeley Avenue Southbound				Dead End Westbound				Berkeley Avenue Northbound				College Driveway 2 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	0	22	0	22	0	0	0	0	0	30	1	31	3	0	0	3	56
21:30	0	25	0	25	0	0	0	0	0	42	1	43	0	0	0	0	68
21:45	0	31	0	31	0	0	0	0	0	24	2	26	2	0	0	2	59
22:00	0	54	0	54	0	0	0	0	0	30	0	30	6	0	0	6	90
Total Volume	0	132	0	132	0	0	0	0	0	126	4	130	11	0	0	11	273
% App. Total	0	100	0		0	0	0		0	96.9	3.1		100	0	0		
PHF	.000	.611	.000	.611	.000	.000	.000	.000	.000	.750	.500	.756	.458	.000	.000	.458	.758



CITY: FULLERTON  
N/S: BERKELEY AVENUE  
E/W: BROOKDALE PLACE

File Name : H1810090  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

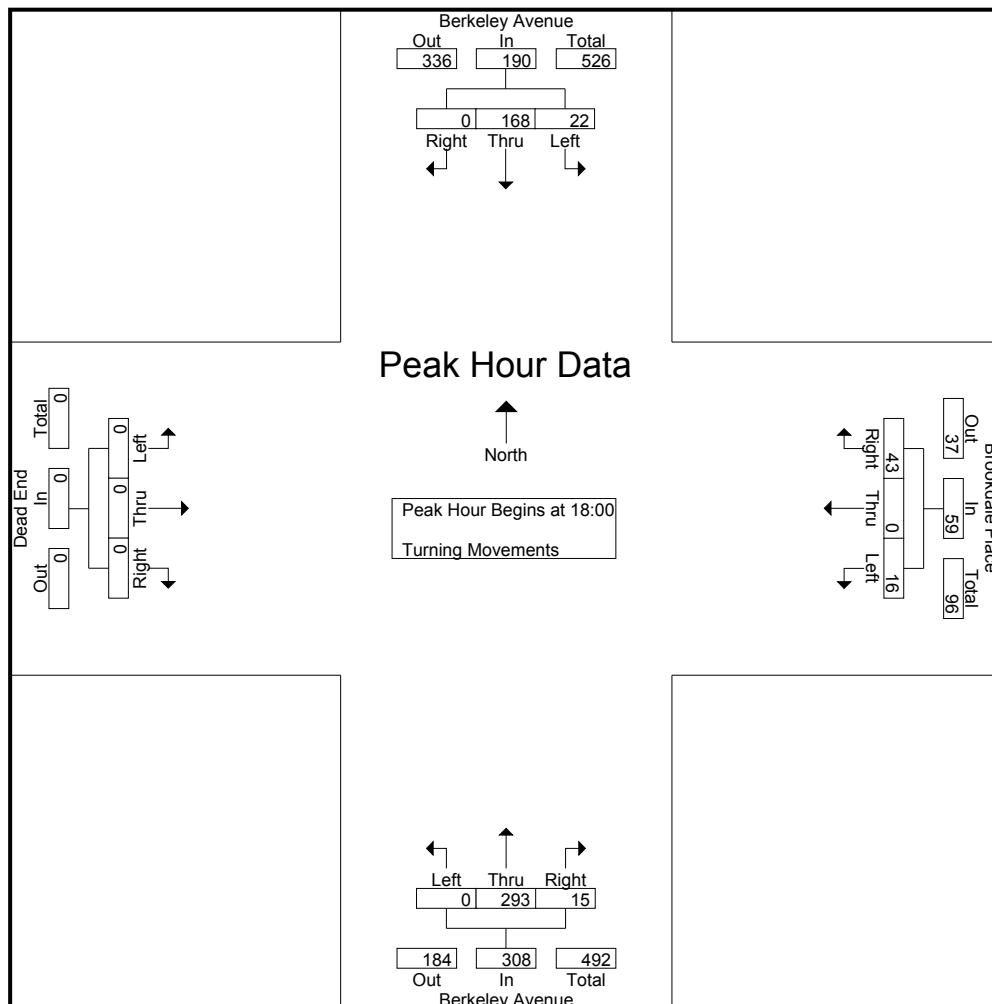
Groups Printed- Turning Movements

	Berkeley Avenue Southbound			Brookdale Place Westbound			Berkeley Avenue Northbound			Dead End Eastbound			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
18:00	0	59	5	21	0	2	7	88	0	0	0	0	182
18:15	0	37	3	6	0	2	3	74	0	0	0	0	125
18:30	0	43	10	4	0	7	3	62	0	0	0	0	129
18:45	0	29	4	12	0	5	2	69	0	0	0	0	121
Total	0	168	22	43	0	16	15	293	0	0	0	0	557
19:00	0	44	5	5	0	4	1	38	0	0	0	0	97
19:15	0	28	6	2	0	1	5	30	0	0	0	0	72
19:30	0	25	6	4	0	3	3	41	0	0	0	0	82
19:45	0	31	4	5	0	7	3	38	0	0	0	0	88
Total	0	128	21	16	0	15	12	147	0	0	0	0	339
21:00	0	18	4	6	0	3	2	24	0	0	0	0	57
21:15	0	23	2	3	0	2	5	28	0	0	0	0	63
21:30	0	22	4	6	0	5	2	36	0	0	0	0	75
21:45	0	29	4	5	0	2	1	21	0	0	0	0	62
Total	0	92	14	20	0	12	10	109	0	0	0	0	257
22:00	0	46	14	2	0	1	1	30	0	0	0	0	94
22:15	0	23	7	1	0	1	1	24	0	0	0	0	57
22:30	0	24	1	2	0	4	3	21	0	0	0	0	55
22:45	0	12	2	1	0	2	1	19	0	0	0	0	37
Total	0	105	24	6	0	8	6	94	0	0	0	0	243
Grand Total	0	493	81	85	0	51	43	643	0	0	0	0	1396
Apprch %	0	85.9	14.1	62.5	0	37.5	6.3	93.7	0	0	0	0	
Total %	0	35.3	5.8	6.1	0	3.7	3.1	46.1	0	0	0	0	

CITY: FULLERTON  
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E/W: BROOKDALE PLACE

File Name : H1810090  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

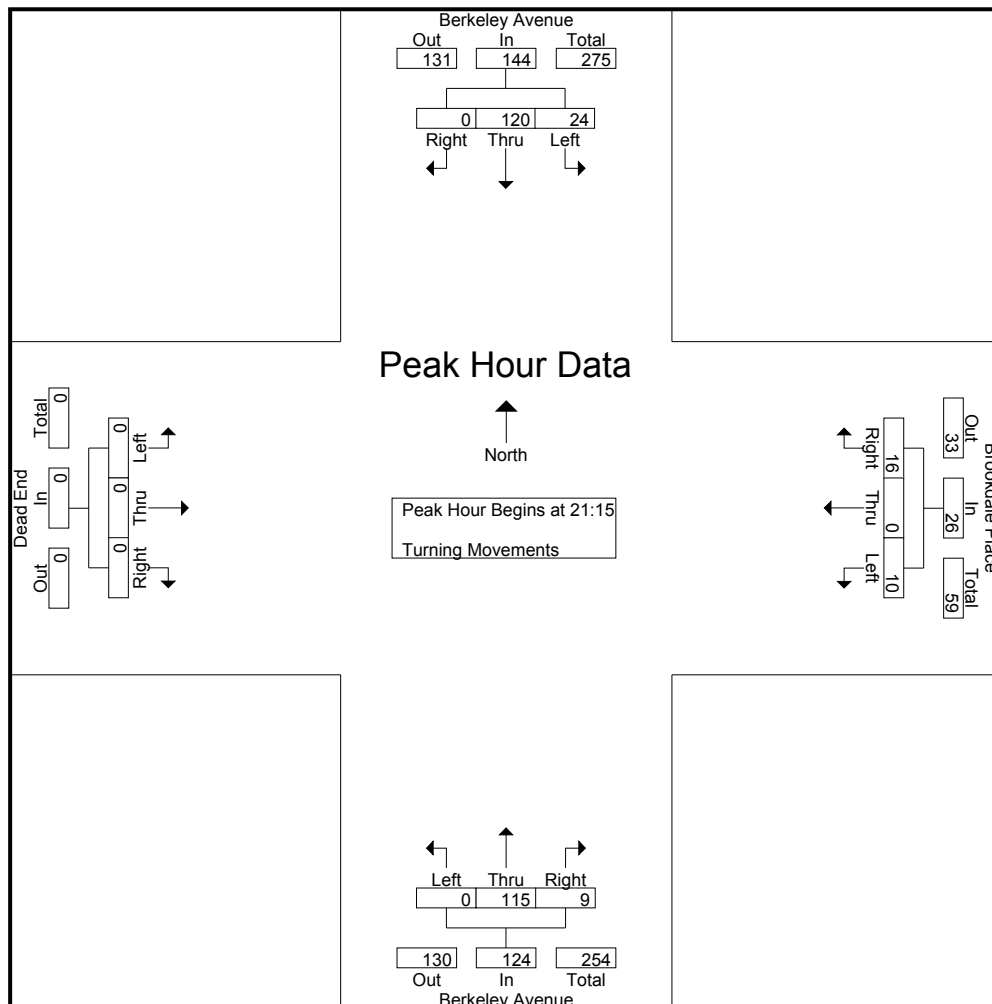
	Berkeley Avenue Southbound				Brookdale Place Westbound				Berkeley Avenue Northbound				Dead End Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	0	59	5	64	21	0	2	23	7	88	0	95	0	0	0	0	182
18:15	0	37	3	40	6	0	2	8	3	74	0	77	0	0	0	0	125
18:30	0	43	10	53	4	0	7	11	3	62	0	65	0	0	0	0	129
18:45	0	29	4	33	12	0	5	17	2	69	0	71	0	0	0	0	121
Total Volume	0	168	22	190	43	0	16	59	15	293	0	308	0	0	0	0	557
% App. Total	0	88.4	11.6		72.9	0	27.1		4.9	95.1	0		0	0	0		
PHF	.000	.712	.550	.742	.512	.000	.571	.641	.536	.832	.000	.811	.000	.000	.000	.000	.765



CITY: FULLERTON  
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E/W: BROOKDALE PLACE

File Name : H1810090  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Berkeley Avenue Southbound				Brookdale Place Westbound				Berkeley Avenue Northbound				Dead End Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:15																	
21:15	0	23	2	25	3	0	2	5	5	28	0	33	0	0	0	0	63
21:30	0	22	4	26	6	0	5	11	2	36	0	38	0	0	0	0	75
21:45	0	29	4	33	5	0	2	7	1	21	0	22	0	0	0	0	62
22:00	0	46	14	60	2	0	1	3	1	30	0	31	0	0	0	0	94
Total Volume	0	120	24	144	16	0	10	26	9	115	0	124	0	0	0	0	294
% App. Total	0	83.3	16.7		61.5	0	38.5		7.3	92.7	0		0	0	0		
PHF	.000	.652	.429	.600	.667	.000	.500	.591	.450	.799	.000	.816	.000	.000	.000	.000	.782



CITY: FULLERTON  
N/S: LEMON STREET  
E/W: PARKING STRUCTURE

File Name : H1810091  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 1

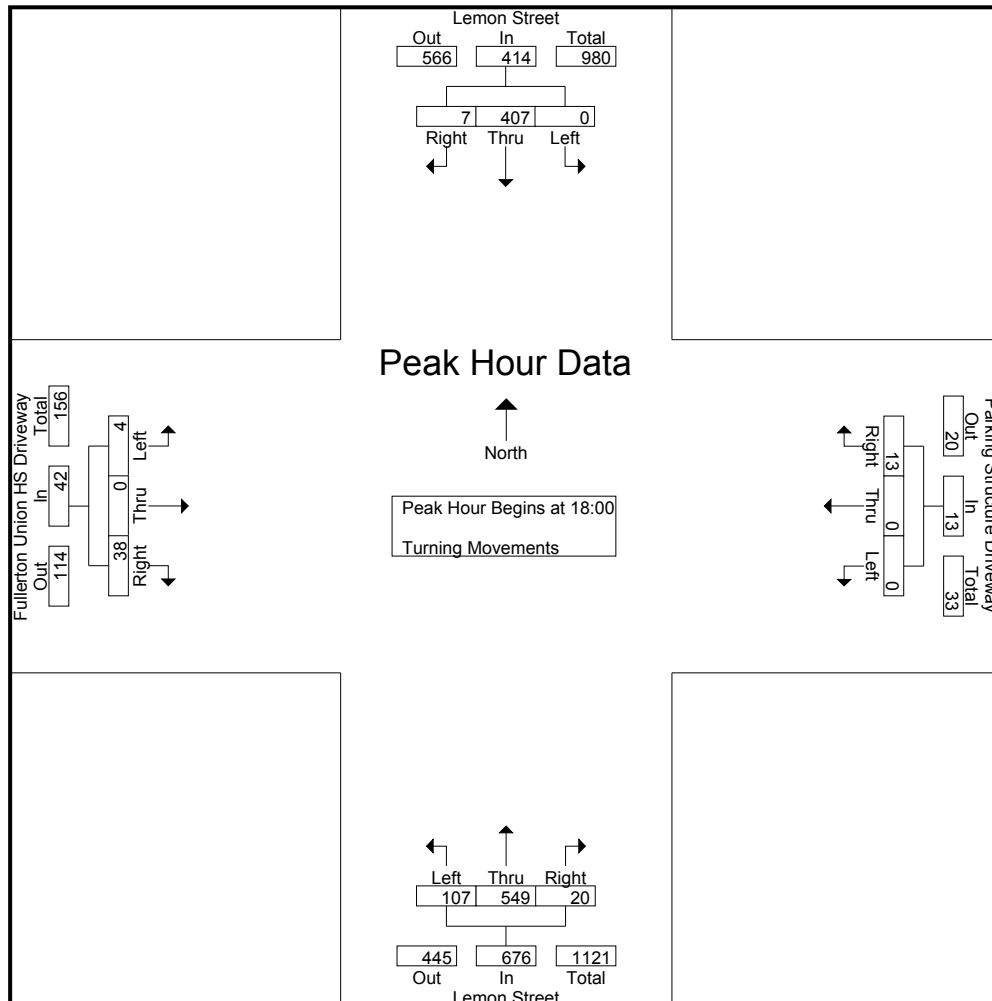
Groups Printed- Turning Movements

	Lemon Street Southbound			Parking Structure Driveway Westbound			Lemon Street Northbound			Fullerton Union HS Driveway Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
18:00	3	104	0	5	0	0	3	164	20	2	0	0	301
18:15	2	95	0	3	0	0	5	137	23	4	0	1	270
18:30	0	101	0	2	0	0	6	122	31	11	0	2	275
18:45	2	107	0	3	0	0	6	126	33	21	0	1	299
Total	7	407	0	13	0	0	20	549	107	38	0	4	1145
19:00	1	111	0	7	0	0	6	111	27	22	0	2	287
19:15	3	65	1	1	0	0	9	93	15	13	0	2	202
19:30	3	63	0	4	0	0	4	73	11	10	1	2	171
19:45	0	38	0	1	0	0	4	82	6	5	0	0	136
Total	7	277	1	13	0	0	23	359	59	50	1	6	796
21:00	0	35	0	9	0	0	1	49	11	2	1	1	109
21:15	2	33	0	4	0	0	2	56	12	5	0	0	114
21:30	5	36	0	4	0	0	0	74	12	7	0	2	140
21:45	0	51	0	16	0	2	0	72	17	20	0	1	179
Total	7	155	0	33	0	2	3	251	52	34	1	4	542
22:00	3	67	0	45	0	0	0	83	23	31	0	0	252
22:15	8	43	0	20	0	0	0	70	12	28	0	7	188
22:30	1	33	0	6	0	0	1	43	9	6	0	0	99
22:45	1	22	0	1	0	0	0	34	1	2	0	1	62
Total	13	165	0	72	0	0	1	230	45	67	0	8	601
Grand Total	34	1004	1	131	0	2	47	1389	263	189	2	22	3084
Apprch %	3.3	96.6	0.1	98.5	0	1.5	2.8	81.8	15.5	88.7	0.9	10.3	
Total %	1.1	32.6	0	4.2	0	0.1	1.5	45	8.5	6.1	0.1	0.7	

CITY: FULLERTON  
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E/W: PARKING STRUCTURE

File Name : H1810091  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 2

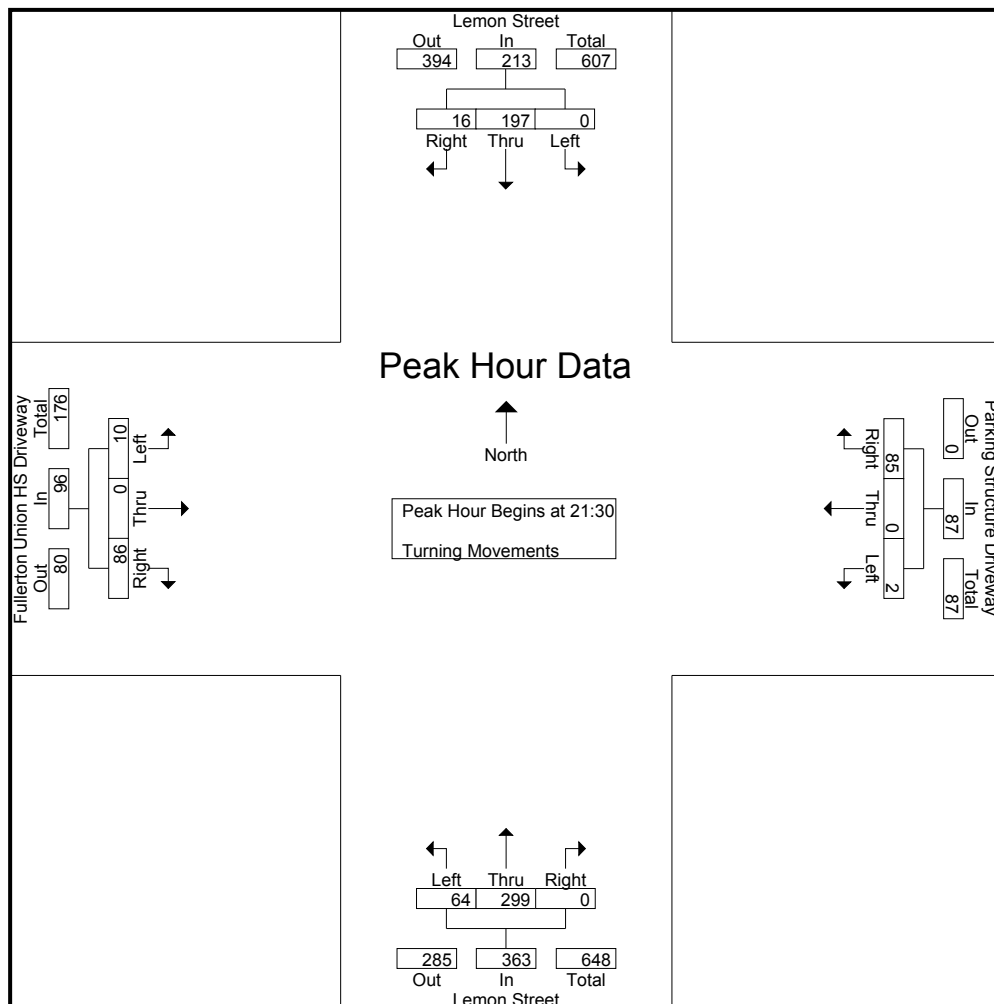
	Lemon Street Southbound				Parking Structure Driveway Westbound				Lemon Street Northbound				Fullerton Union HS Driveway Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 18:00 to 19:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 18:00																	
18:00	3	104	0	107	5	0	0	5	3	164	20	187	2	0	0	2	301
18:15	2	95	0	97	3	0	0	3	5	137	23	165	4	0	1	5	270
18:30	0	101	0	101	2	0	0	2	6	122	31	159	11	0	2	13	275
18:45	2	107	0	109	3	0	0	3	6	126	33	165	21	0	1	22	299
Total Volume	7	407	0	414	13	0	0	13	20	549	107	676	38	0	4	42	1145
% App. Total	1.7	98.3	0		100	0	0		3	81.2	15.8		90.5	0	9.5		
PHF	.583	.951	.000	.950	.650	.000	.000	.650	.833	.837	.811	.904	.452	.000	.500	.477	.951



CITY: FULLERTON  
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File Name : H1810091  
Site Code : 07118823  
Start Date : 10/26/2018  
Page No : 3

	Lemon Street Southbound				Parking Structure Driveway Westbound				Lemon Street Northbound				Fullerton Union HS Driveway Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 21:00 to 22:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 21:30																	
21:30	5	36	0	41	4	0	0	4	0	74	12	86	7	0	2	9	140
21:45	0	51	0	51	16	0	2	18	0	72	17	89	20	0	1	21	179
22:00	3	67	0	70	45	0	0	45	0	83	23	106	31	0	0	31	252
22:15	8	43	0	51	20	0	0	20	0	70	12	82	28	0	7	35	188
Total Volume	16	197	0	213	85	0	2	87	0	299	64	363	86	0	10	96	759
% App. Total	7.5	92.5	0		97.7	0	2.3		0	82.4	17.6		89.6	0	10.4		
PHF	.500	.735	.000	.761	.472	.000	.250	.483	.000	.901	.696	.856	.694	.000	.357	.686	.753





## **APPENDIX N**

### **EXISTING PLUS PROJECT TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS (FRIDAY FIELD EVENT PROJECT ANALYSIS)**

*APPENDIX N-1*





**EXISTING FRIDAY ARRIVAL PEAK HOUR**

### Intersection Level Of Service Report

#### Intersection 1: Harbor Boulevard at Bastanchury Road

Control Type:	Signalized	Delay (sec / veh):	37.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	161	956	131	303	790	287	155	966	155	130	1011	315
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	161	956	131	303	790	287	155	966	155	130	1011	315
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	239	33	76	198	72	39	242	39	33	253	79
Total Analysis Volume [veh/h]	161	956	131	303	790	287	155	966	155	130	1011	315
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	42	0	13	44	0	13	44	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	51	51	9	53	53	9	28	28	6	25	25
g / C, Green / Cycle	0.06	0.47	0.47	0.08	0.48	0.48	0.08	0.25	0.25	0.05	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.05	0.17	0.07	0.09	0.19	0.19	0.09	0.20	0.20	0.04	0.18	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	223	2650	837	289	1838	871	148	959	454	192	1281	405
d1, Uniform Delay [s]	50.59	18.93	17.00	50.51	18.22	18.06	50.51	38.36	38.68	51.09	40.22	40.11
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.13	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.38	0.38	0.40	38.71	0.66	1.30	46.33	1.45	4.14	4.16	1.12	3.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.72	0.36	0.16	1.05	0.40	0.39	1.04	0.78	0.81	0.68	0.79	0.78
d, Delay for Lane Group [s/veh]	54.96	19.32	17.39	89.22	18.87	19.36	96.84	39.81	42.82	55.25	41.35	43.38
Lane Group LOS	D	B	B	F	B	B	F	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.31	5.24	1.99	5.51	6.08	5.67	5.98	9.56	9.77	1.87	8.66	8.32
50th-Percentile Queue Length [ft/ln]	57.71	131.09	49.82	137.82	151.89	141.70	149.61	239.10	244.27	46.69	216.55	207.93
95th-Percentile Queue Length [veh/ln]	4.15	9.00	3.59	9.52	10.12	9.57	10.15	14.64	14.90	3.36	13.49	13.05
95th-Percentile Queue Length [ft/ln]	103.87	224.97	89.68	237.94	252.94	239.31	253.64	365.89	372.43	84.05	337.22	326.17

**Movement, Approach, & Intersection Results**

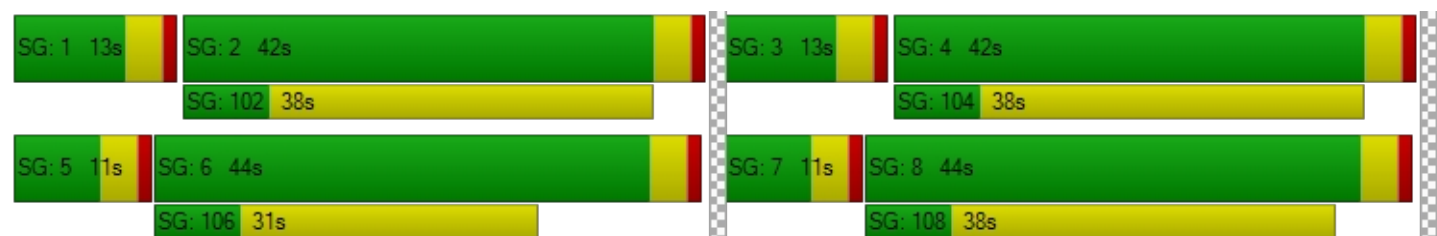
d_M, Delay for Movement [s/veh]	54.96	19.32	17.39	89.22	18.90	19.36	96.84	40.48	42.82	55.25	41.35	43.38
Movement LOS	D	B	B	F	B	B	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.71			34.44			47.61			43.03		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.41											
Intersection LOS	D											
Intersection V/C	0.606											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.110			3.077			2.984			3.168		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			727			727			691		
d_b, Bicycle Delay [s]	23.56			22.27			22.27			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.246			2.319			2.261			2.360		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.555

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	28	1076	631	93	927	28	76	127	29	522	75	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1076	631	93	927	28	76	127	29	522	75	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	269	158	23	232	7	19	32	7	131	19	0
Total Analysis Volume [veh/h]	28	1076	631	93	927	28	76	127	29	522	75	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	56	7	60	60	10	10	10	21	21
g / C, Green / Cycle	0.03	0.51	0.07	0.54	0.54	0.09	0.09	0.09	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.05	0.20	0.10	0.04	0.07	0.02	0.16	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	58	2886	119	2052	972	160	169	160	348	348
d1, Uniform Delay [s]	52.36	16.53	50.63	14.60	12.99	47.73	48.99	46.46	42.88	42.98
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.00	0.37	10.58	0.52	0.44	2.19	6.65	0.54	5.92	6.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.37	0.78	0.37	0.19	0.48	0.75	0.18	0.85	0.86
d, Delay for Lane Group [s/veh]	58.36	16.90	61.21	15.12	13.43	49.92	55.64	47.00	48.80	49.31
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	5.48	2.87	5.52	2.44	2.08	3.71	0.76	8.31	8.46
50th-Percentile Queue Length [ft/ln]	21.42	137.06	71.69	137.89	60.97	51.99	92.79	19.01	207.82	211.48
95th-Percentile Queue Length [veh/ln]	1.54	9.32	5.16	9.37	4.39	3.74	6.68	1.37	13.04	13.23
95th-Percentile Queue Length [ft/ln]	38.56	233.06	129.04	234.18	109.74	93.58	167.01	34.21	326.03	330.72

**Movement, Approach, & Intersection Results**

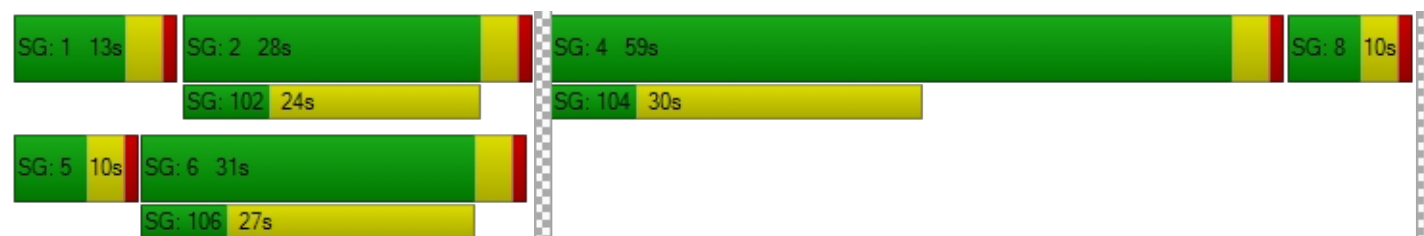
d_M, Delay for Movement [s/veh]	58.36	16.90	0.00	61.21	14.83	13.43	49.92	55.64	47.00	49.02	49.31	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	17.96			18.91			52.68			49.05		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.22											
Intersection LOS	C											
Intersection V/C	0.555											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.910			2.229			2.215		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.167			2.136			1.942			2.545		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.696

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	74	1282	32	258	1109	17	37	112	82	56	134	393
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	1282	32	258	1109	17	37	112	82	56	134	393
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	321	8	65	277	4	9	28	21	14	34	98
Total Analysis Volume [veh/h]	74	1282	32	258	1109	17	37	112	82	56	134	393
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	57	0	16	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	63	63	12	69	69	23	23	23	23	23	39
g / C, Green / Cycle	0.05	0.57	0.57	0.11	0.63	0.63	0.21	0.21	0.21	0.21	0.21	0.36
(v / s)_i Volume / Saturation Flow Rate	0.04	0.36	0.35	0.07	0.29	0.01	0.02	0.06	0.05	0.03	0.07	0.22
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	99	1087	1030	387	2385	1130	299	396	375	317	396	639
d1, Uniform Delay [s]	51.20	15.64	15.58	46.96	10.77	7.70	35.17	36.60	36.09	35.55	37.06	29.24
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.30
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.67	2.69	2.79	1.99	0.65	0.02	0.18	0.39	0.29	0.26	0.50	2.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.62	0.62	0.67	0.47	0.02	0.12	0.28	0.22	0.18	0.34	0.61
d, Delay for Lane Group [s/veh]	61.87	18.34	18.37	48.95	11.42	7.72	35.35	36.99	36.38	35.81	37.56	31.93
Lane Group LOS	E	B	B	D	B	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.30	11.53	10.84	3.49	6.87	0.15	0.82	2.57	1.86	1.25	3.12	8.93
50th-Percentile Queue Length [ft/ln]	57.50	288.29	270.97	87.31	171.69	3.84	20.48	64.37	46.45	31.32	78.07	223.27
95th-Percentile Queue Length [veh/ln]	4.14	17.10	16.24	6.29	11.17	0.28	1.47	4.63	3.34	2.26	5.62	13.83
95th-Percentile Queue Length [ft/ln]	103.50	427.52	405.95	157.16	279.14	6.90	36.86	115.87	83.62	56.38	140.52	345.80

**Movement, Approach, & Intersection Results**

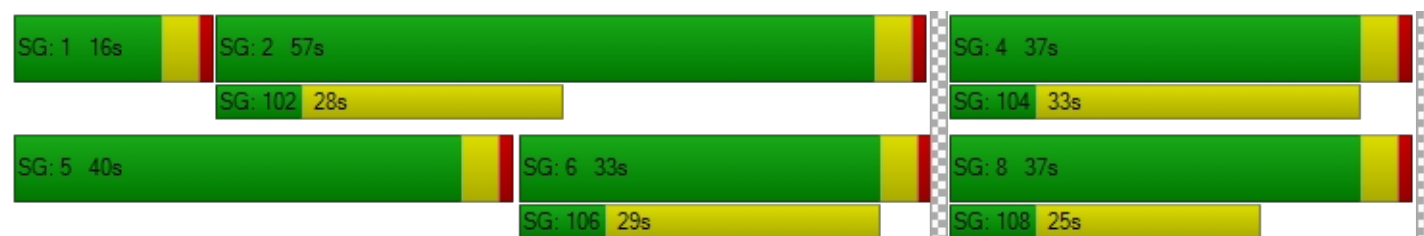
d_M, Delay for Movement [s/veh]	61.87	18.35	18.37	48.95	11.42	7.72	35.35	36.99	36.38	35.81	37.56	31.93
Movement LOS	E	B	B	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	20.67			18.38			36.51			33.60		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	22.91											
Intersection LOS	C											
Intersection V/C	0.696											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.903			3.087			2.252			2.501		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			527			600			600		
d_b, Bicycle Delay [s]	14.77			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.705			2.701			1.941			2.522		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	49.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.460

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	233	274	77	62	247	23	105	204	10	117	307	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	233	274	77	62	247	23	105	204	10	117	307	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	69	19	16	62	6	26	51	3	29	77	17
Total Analysis Volume [veh/h]	233	274	77	62	247	23	105	204	10	117	307	69
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	46	46	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	42	42	42	42	14	14	60	14	14	14
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.13	0.13	0.55	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.13	0.15	0.04	0.03	0.15	0.06	0.11	0.01	0.07	0.10	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	685	685	685	685	685	99	246	984	93	246	233
d1, Uniform Delay [s]	24.20	24.85	22.01	21.82	24.78	44.07	46.66	11.37	43.91	46.49	46.23
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.35	1.74	0.33	0.26	1.70	60.18	7.10	0.02	136.29	6.13	5.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.40	0.11	0.09	0.39	1.06	0.83	0.01	1.26	0.81	0.77
d, Delay for Lane Group [s/veh]	25.55	26.59	22.34	22.08	26.48	104.25	53.77	11.38	180.20	52.62	51.44
Lane Group LOS	C	C	C	C	C	F	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.54	5.51	1.35	1.08	5.41	4.13	5.91	0.12	5.82	5.66	5.03
50th-Percentile Queue Length [ft/ln]	113.60	137.71	33.80	26.96	135.29	103.15	147.63	2.89	145.48	141.38	125.68
95th-Percentile Queue Length [veh/ln]	8.04	9.36	2.43	1.94	9.23	7.43	9.89	0.21	10.47	9.55	8.70
95th-Percentile Queue Length [ft/ln]	200.99	233.93	60.83	48.52	230.66	185.66	247.26	5.20	261.86	238.87	217.61

**Movement, Approach, & Intersection Results**

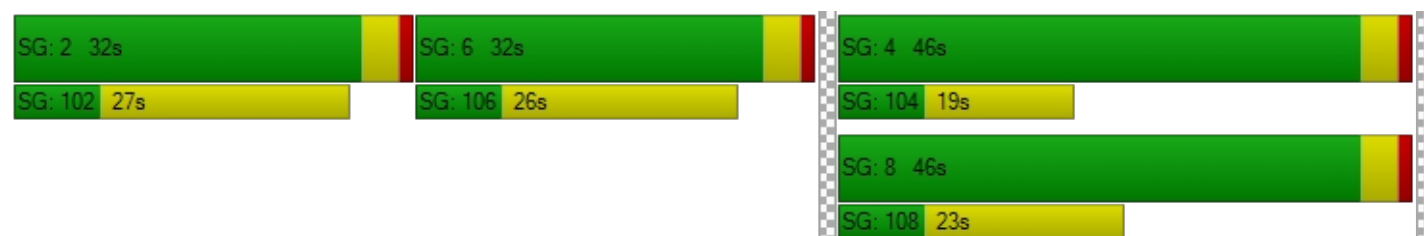
d_M, Delay for Movement [s/veh]	25.55	26.59	22.34	22.08	26.48	26.48	104.25	53.77	11.38	180.20	52.20	51.44
Movement LOS	C	C	C	C	C	C	F	D	B	F	D	D
d_A, Approach Delay [s/veh]	25.61			25.66			69.05			82.47		
Approach LOS	C			C			E			F		
d_I, Intersection Delay [s/veh]	49.86											
Intersection LOS	D											
Intersection V/C	0.460											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.541			2.353			2.481			2.344		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			764			764		
d_b, Bicycle Delay [s]	30.56			30.56			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.523			2.107			2.086			1.966		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	175	136	180	362	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	175	136	180	362	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	44	34	45	91	7
Total Analysis Volume [veh/h]	17	175	136	180	362	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	72	0	0	38	38	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	89	89	89	89
g / C, Green / Cycle	0.12	0.12	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.08	0.09	0.19	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	211	211	1397	1539	1539	1458
d1, Uniform Delay [s]	43.21	47.41	2.14	2.19	2.45	2.01
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.14	0.14	0.15	0.36	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.83	0.10	0.12	0.24	0.02
d, Delay for Lane Group [s/veh]	43.37	55.55	2.28	2.34	2.81	2.04
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.42	5.14	0.48	0.65	1.46	0.10
50th-Percentile Queue Length [ft/ln]	10.56	128.54	12.09	16.17	36.49	2.41
95th-Percentile Queue Length [veh/ln]	0.76	8.86	0.87	1.16	2.63	0.17
95th-Percentile Queue Length [ft/ln]	19.01	221.51	21.76	29.11	65.69	4.33

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	43.37	55.55	2.28	2.34	2.81	2.04
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	54.47		2.32		2.75	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.64					
Intersection LOS	B					
Intersection V/C	0.310					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.259	2.227	2.141
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.654	4.778
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 72s

SG: 101 26s

SG: 4 38s

SG: 104 21s




SG: 8 38s

### Intersection Level Of Service Report

#### Intersection 6: Euclid Street at Malvern Avenue

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

#### Intersection Setup

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	220	1205	108	125	867	23	42	495	167	176	757	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	1205	108	125	867	23	42	495	167	176	757	179
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	301	27	31	217	6	11	124	42	44	189	45
Total Analysis Volume [veh/h]	220	1205	108	125	867	23	42	495	167	176	757	179
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	61	51	51	61	51	51	41	31	31	41	32	32
g / C, Green / Cycle	0.56	0.47	0.47	0.56	0.47	0.47	0.37	0.28	0.28	0.37	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.12	0.36	0.35	0.07	0.24	0.24	0.02	0.19	0.17	0.10	0.26	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	777	884	837	544	882	835	318	532	504	471	560	531
d1, Uniform Delay [s]	12.38	24.54	24.27	11.68	20.85	20.79	22.26	35.08	34.44	24.09	37.06	36.22
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.91	6.43	6.27	0.21	2.20	2.27	0.19	1.44	1.21	0.49	4.94	3.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.77	0.75	0.23	0.52	0.52	0.13	0.67	0.61	0.37	0.89	0.83
d, Delay for Lane Group [s/veh]	13.29	30.96	30.53	11.89	23.05	23.06	22.44	36.52	35.65	24.59	42.00	39.60
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.87	15.83	14.55	1.47	8.69	8.16	0.72	8.54	7.28	3.25	13.32	11.36
50th-Percentile Queue Length [ft/ln]	71.81	395.68	363.65	36.66	217.26	203.91	17.98	213.42	182.06	81.33	333.12	283.97
95th-Percentile Queue Length [veh/ln]	5.17	22.35	20.80	2.64	13.53	12.84	1.29	13.33	11.71	5.86	19.31	16.89
95th-Percentile Queue Length [ft/ln]	129.27	558.79	520.02	65.98	338.13	321.00	32.37	333.21	292.70	146.40	482.79	422.15

**Movement, Approach, & Intersection Results**

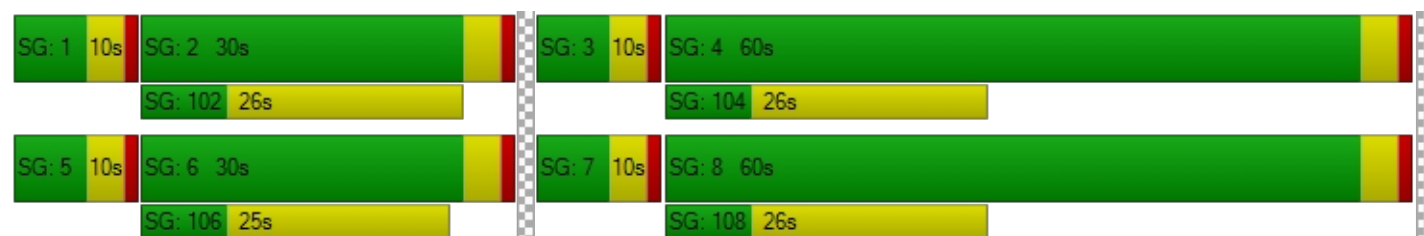
d_M, Delay for Movement [s/veh]	13.29	30.78	30.53	11.89	23.05	23.06	22.44	36.27	35.65	24.59	41.17	39.60
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	28.25			21.68			35.30			38.29		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.42											
Intersection LOS	C											
Intersection V/C	0.786											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.919			2.804			2.793			2.754		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.824			2.397			2.140			2.477		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 7: Harbor Boulevard at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	124	981	91	132	886	142	219	564	146	188	842	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	124	981	91	132	886	142	219	564	146	188	842	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	245	23	33	222	36	55	141	37	47	211	45
Total Analysis Volume [veh/h]	124	981	91	132	886	142	219	564	146	188	842	181
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	10	59	0	10	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	53	53	63	53	53	39	29	29	39	29	29
g / C, Green / Cycle	0.58	0.49	0.49	0.58	0.49	0.49	0.35	0.26	0.26	0.35	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.07	0.29	0.29	0.07	0.28	0.27	0.12	0.20	0.18	0.10	0.22	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	748	920	871	730	920	872	356	496	469	404	991	469
d1, Uniform Delay [s]	10.69	20.75	20.50	10.74	20.45	20.08	26.28	37.55	36.89	25.77	38.64	33.44
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.48	2.97	2.92	0.12	2.74	2.59	1.73	2.46	1.98	0.83	2.15	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.61	0.59	0.18	0.59	0.56	0.62	0.76	0.71	0.47	0.85	0.39
d, Delay for Lane Group [s/veh]	11.16	23.72	23.42	10.86	23.19	22.66	28.01	40.01	38.86	26.61	40.79	33.96
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.44	10.92	9.95	1.46	10.40	9.22	4.39	9.64	8.29	3.65	10.96	4.04
50th-Percentile Queue Length [ft/ln]	36.09	273.09	248.71	36.54	260.01	230.54	109.81	240.96	207.29	91.19	274.03	100.90
95th-Percentile Queue Length [veh/ln]	2.60	16.34	15.12	2.63	15.69	14.20	7.83	14.73	13.01	6.57	16.39	7.26
95th-Percentile Queue Length [ft/ln]	64.96	408.60	378.03	65.78	392.23	355.04	195.74	368.24	325.34	164.14	409.77	181.62

**Movement, Approach, & Intersection Results**

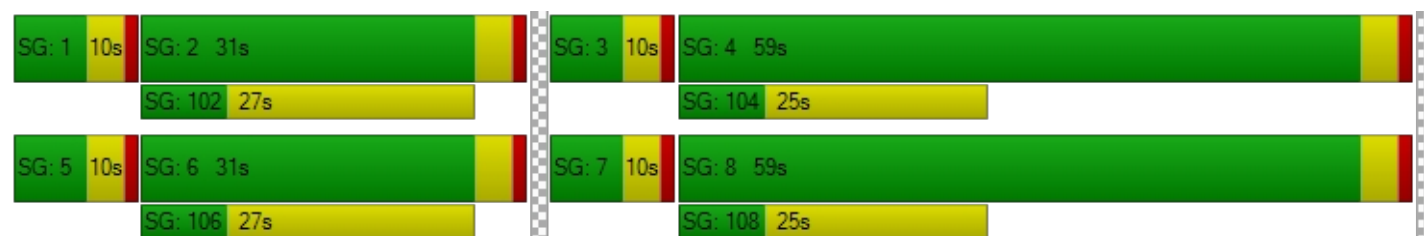
d_M, Delay for Movement [s/veh]	11.16	23.59	23.42	10.86	22.99	22.66	28.01	39.63	38.86	26.61	40.79	33.96
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	22.29			21.57			36.77			37.57		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	29.21											
Intersection LOS	C											
Intersection V/C	0.748											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.855			2.892			2.795			2.882		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			1000		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.546			2.517			2.326			2.559		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	31.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	114	492	86	49	376	78	95	543	130	149	989	102
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	492	86	49	376	78	95	543	130	149	989	102
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	123	22	12	94	20	24	136	33	37	247	26
Total Analysis Volume [veh/h]	114	492	86	49	376	78	95	543	130	149	989	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	10	31	0	16	57	0	11	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	58	49	49	58	48	48	7	33	33	7	33	33
g / C, Green / Cycle	0.53	0.45	0.45	0.53	0.44	0.44	0.07	0.30	0.30	0.06	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.05	0.03	0.13	0.12	0.05	0.19	0.18	0.04	0.26	0.06
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	890	1698	804	887	829	785	122	578	548	211	1129	535
d1, Uniform Delay [s]	13.18	19.36	17.70	12.69	20.00	19.87	50.52	32.81	32.32	50.77	36.78	28.84
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	0.43	0.27	0.03	0.87	0.86	10.28	1.08	0.96	4.28	2.34	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.29	0.11	0.06	0.29	0.27	0.78	0.62	0.58	0.71	0.88	0.19
d, Delay for Lane Group [s/veh]	13.48	19.79	17.96	12.72	20.88	20.73	60.80	33.88	33.29	55.05	39.12	29.01
Lane Group LOS	B	B	B	B	C	C	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.48	4.06	1.32	0.59	4.11	3.69	2.92	8.25	7.20	2.14	12.81	2.04
50th-Percentile Queue Length [ft/ln]	37.06	101.43	33.10	14.73	102.68	92.31	72.95	206.33	179.99	53.43	320.26	50.95
95th-Percentile Queue Length [veh/ln]	2.67	7.30	2.38	1.06	7.39	6.65	5.25	12.96	11.60	3.85	18.68	3.67
95th-Percentile Queue Length [ft/ln]	66.70	182.57	59.58	26.52	184.82	166.15	131.32	324.12	290.00	96.18	467.01	91.72

**Movement, Approach, & Intersection Results**

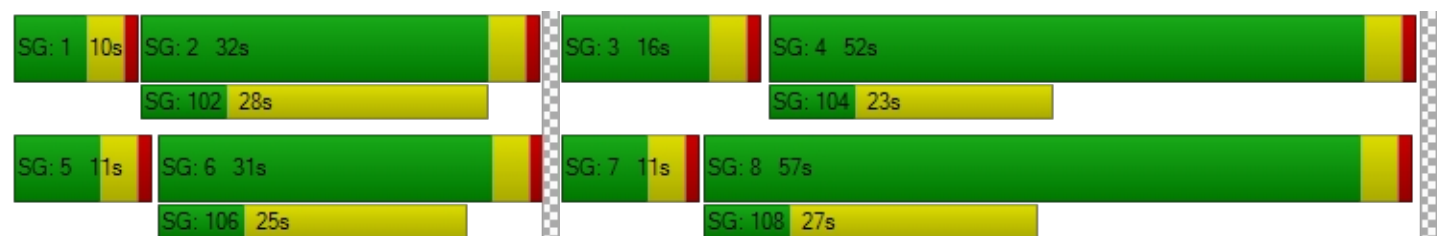
d_M, Delay for Movement [s/veh]	13.48	19.79	17.96	12.72	20.83	20.73	60.80	33.68	33.29	55.05	39.12	29.01
Movement LOS	B	B	B	B	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	18.52			20.02			36.97			40.21		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	31.58											
Intersection LOS	C											
Intersection V/C	0.554											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.681			2.542			2.763			2.903		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			964			873		
d_b, Bicycle Delay [s]	30.56			31.31			14.77			17.47		
I_b,int, Bicycle LOS Score for Intersection	2.131			1.975			2.193			2.583		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.418

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	8	18	14	198	12	38	26	620	5	17	1149	294
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	18	14	198	12	38	26	620	5	17	1149	294
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	5	4	50	3	10	7	155	1	4	287	74
Total Analysis Volume [veh/h]	8	18	14	198	12	38	26	620	5	17	1149	294
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	9	18	84	84	84	77	77	90
g / C, Green / Cycle	0.04	0.04	0.04	0.09	0.16	0.77	0.77	0.77	0.70	0.70	0.82
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.06	0.03	0.01	0.17	0.17	0.01	0.30	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	67	74	70	302	291	1225	1455	1378	1194	2656	1479
d1, Uniform Delay [s]	51.05	51.30	51.22	48.71	39.79	3.06	3.63	3.63	5.03	7.14	2.09
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	1.68	1.38	2.43	0.28	0.01	0.35	0.37	0.02	0.52	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.24	0.20	0.66	0.17	0.02	0.22	0.22	0.01	0.43	0.20
d, Delay for Lane Group [s/veh]	51.82	52.98	52.59	51.14	40.07	3.07	3.98	4.00	5.05	7.66	2.16
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.23	0.52	0.40	2.73	1.19	0.11	1.79	1.70	0.12	5.37	0.92
50th-Percentile Queue Length [ft/ln]	5.69	12.90	10.02	68.26	29.82	2.87	44.73	42.43	2.88	134.31	23.12
95th-Percentile Queue Length [veh/ln]	0.41	0.93	0.72	4.91	2.15	0.21	3.22	3.05	0.21	9.17	1.66
95th-Percentile Queue Length [ft/ln]	10.23	23.22	18.03	122.87	53.68	5.16	80.51	76.37	5.18	229.34	41.61

**Movement, Approach, & Intersection Results**

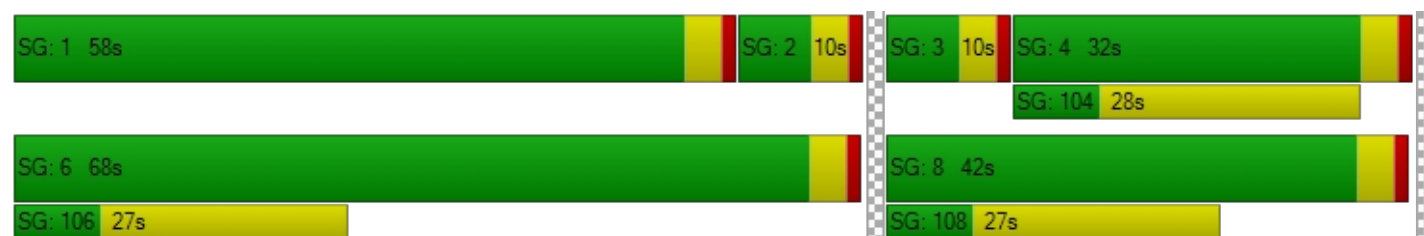
d_M, Delay for Movement [s/veh]	51.82	52.98	52.59	51.14	40.07	40.07	3.07	3.99	4.00	5.05	7.66	2.16
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.61			48.91			3.95			6.52		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.97											
Intersection LOS	B											
Intersection V/C	0.418											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.183			2.310			2.681			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			1.969			2.097			2.764		
Bicycle LOS	A			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 10: Raymond Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

#### Intersection Setup

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	282	181	182	63	114	46	58	692	117	122	1158	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	282	181	182	63	114	46	58	692	117	122	1158	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	45	46	16	29	12	15	173	29	31	290	20
Total Analysis Volume [veh/h]	282	181	182	63	114	46	58	692	117	122	1158	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	46	0	19	46	0	10	35	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	26	17	17	26	7	7	76	66	66	76	67	67
g / C, Green / Cycle	0.24	0.16	0.16	0.24	0.07	0.07	0.69	0.60	0.60	0.69	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.16	0.10	0.10	0.04	0.04	0.04	0.03	0.22	0.21	0.07	0.34	0.33
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	456	295	279	371	126	119	954	1136	1076	1113	1151	1090
d1, Uniform Delay [s]	37.79	43.42	43.70	33.03	50.23	50.13	5.53	11.47	11.31	5.74	12.93	12.80
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.37	2.07	2.56	0.21	5.97	5.61	0.03	0.95	0.92	0.20	1.96	1.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.62	0.61	0.65	0.17	0.67	0.64	0.06	0.37	0.36	0.11	0.56	0.55
d, Delay for Lane Group [s/veh]	39.16	45.49	46.26	33.24	56.20	55.74	5.56	12.42	12.23	5.94	14.88	14.77
Lane Group LOS	D	D	D	C	E	E	A	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.99	4.76	4.84	1.35	2.46	2.23	0.40	5.45	4.84	0.93	9.50	8.75
50th-Percentile Queue Length [ft/ln]	174.80	118.98	121.09	33.83	61.52	55.67	10.11	136.23	121.03	23.24	237.43	218.87
95th-Percentile Queue Length [veh/ln]	11.33	8.34	8.45	2.44	4.43	4.01	0.73	9.28	8.45	1.67	14.55	13.61
95th-Percentile Queue Length [ft/ln]	283.22	208.42	211.32	60.90	110.74	100.21	18.20	231.94	211.24	41.83	363.79	340.19

**Movement, Approach, & Intersection Results**

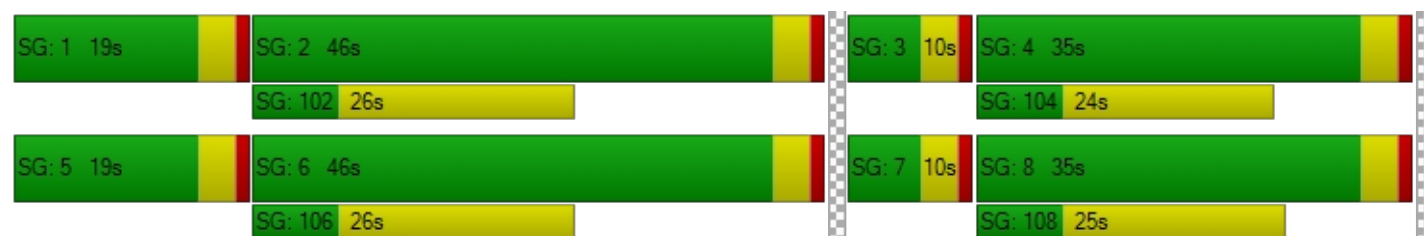
d_M, Delay for Movement [s/veh]	39.16	45.49	46.26	33.24	56.08	55.74	5.56	12.34	12.23	5.94	14.83	14.77
Movement LOS	D	D	D	C	E	E	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	42.94			49.56			11.87			14.03		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	22.01											
Intersection LOS	C											
Intersection V/C	0.629											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.611			2.325			2.802			2.773		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			764			564			564		
d_b, Bicycle Delay [s]	21.02			21.02			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.624			1.744			2.275			2.682		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.447

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	65	78	34	46	35	30	822	36	73	1223	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	65	78	34	46	35	30	822	36	73	1223	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	16	20	9	12	9	8	206	9	18	306	12
Total Analysis Volume [veh/h]	89	65	78	34	46	35	30	822	36	73	1223	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	18	31	0	10	23	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	95	85	85	95	87	87
g / C, Green / Cycle	0.07	0.07	0.07	0.07	0.07	0.86	0.78	0.78	0.86	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.05	0.02	0.23	0.23	0.04	0.35	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	76	126	119	95	119	1444	1474	1397	1520	1505	1425
d1, Uniform Delay [s]	50.06	49.65	50.13	48.88	50.21	1.08	3.60	3.59	1.11	3.64	3.62
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	105.47	3.25	5.94	2.25	6.61	0.01	0.53	0.54	0.06	0.92	0.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.18	0.52	0.65	0.36	0.68	0.02	0.30	0.30	0.05	0.44	0.43
d, Delay for Lane Group [s/veh]	155.52	52.91	56.07	51.13	56.82	1.09	4.13	4.13	1.17	4.56	4.57
Lane Group LOS	F	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.24	1.84	2.29	0.95	2.40	0.04	2.50	2.33	0.13	3.85	3.60
50th-Percentile Queue Length [ft/ln]	106.04	46.04	57.25	23.73	59.91	1.08	62.38	58.21	3.18	96.13	89.93
95th-Percentile Queue Length [veh/ln]	7.63	3.31	4.12	1.71	4.31	0.08	4.49	4.19	0.23	6.92	6.48
95th-Percentile Queue Length [ft/ln]	190.87	82.87	103.05	42.71	107.83	1.94	112.28	104.78	5.72	173.04	161.88

**Movement, Approach, & Intersection Results**

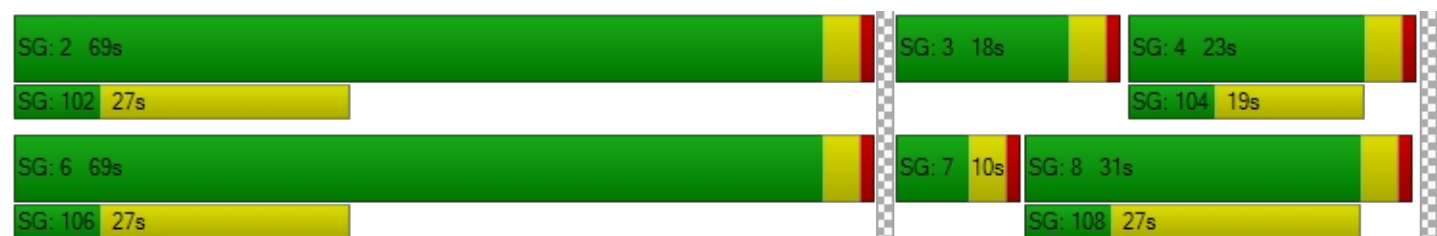
d_M, Delay for Movement [s/veh]	155.52	52.91	56.07	51.13	56.82	56.82	1.09	4.13	4.13	1.17	4.57	4.57
Movement LOS	F	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	93.34			55.14			4.03			4.38		
Approach LOS	F			E			A			A		
d_I, Intersection Delay [s/veh]	14.52											
Intersection LOS	B											
Intersection V/C	0.447											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.318			2.068			2.872			2.802		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			345		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			37.64		
I_b,int, Bicycle LOS Score for Intersection	1.942			1.749			2.292			2.668		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	182	545	101	190	572	366	295	580	94	174	944	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	182	545	101	190	572	366	295	580	94	174	944	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	136	25	48	143	92	74	145	24	44	236	39
Total Analysis Volume [veh/h]	182	545	101	190	572	366	295	580	94	174	944	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	34	0	20	37	37	15	34	0	22	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	44	44	8	39	54	11	29	29	13	31	31
g / C, Green / Cycle	0.12	0.40	0.40	0.07	0.36	0.49	0.10	0.26	0.26	0.11	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.10	0.14	0.06	0.05	0.15	0.20	0.08	0.15	0.05	0.10	0.25	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	213	1520	720	264	1356	890	354	1004	476	208	1058	501
d1, Uniform Delay [s]	47.65	23.16	21.02	49.82	26.83	17.68	48.61	35.20	31.47	47.74	38.18	31.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.27	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.37	0.66	0.41	3.71	0.96	0.75	5.13	0.53	0.20	8.68	2.88	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.36	0.14	0.72	0.42	0.41	0.83	0.58	0.20	0.84	0.89	0.31
d, Delay for Lane Group [s/veh]	57.02	23.82	21.43	53.53	27.79	18.43	53.75	35.73	31.67	56.42	41.05	31.79
Lane Group LOS	E	C	C	D	C	B	D	D	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.43	5.05	1.73	2.69	5.83	5.96	4.22	6.78	1.97	5.16	12.46	3.35
50th-Percentile Queue Length [ft/ln]	135.84	126.31	43.35	67.23	145.64	149.06	105.47	169.57	49.27	129.01	311.59	83.68
95th-Percentile Queue Length [veh/ln]	9.26	8.74	3.12	4.84	9.78	9.97	7.59	11.05	3.55	8.89	18.25	6.02
95th-Percentile Queue Length [ft/ln]	231.42	218.46	78.03	121.01	244.60	249.17	189.68	276.35	88.69	222.15	456.33	150.62

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	57.02	23.82	21.43	53.53	27.79	18.43	53.75	35.73	31.67	56.42	41.05	31.79
Movement LOS	E	C	C	D	C	B	D	D	C	E	D	C
d_A, Approach Delay [s/veh]	30.83			29.09			40.82			42.01		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.06											
Intersection LOS	D											
Intersection V/C	0.717											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.733			2.899			2.946			2.811		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			545			673		
d_b, Bicycle Delay [s]	29.09			26.95			29.09			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.243			2.490			2.359			2.611		
Bicycle LOS	B			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	89	0	179	0	744	341	299	1349	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	89	0	179	0	744	341	299	1349	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	22	0	45	0	186	85	75	337	0
Total Analysis Volume [veh/h]	0	0	0	89	0	179	0	744	341	299	1349	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	26	0	0	20	0	64	84	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		13	13	64	64	21	89
g / C, Green / Cycle		0.12	0.12	0.58	0.58	0.19	0.81
(v / s)_i Volume / Saturation Flow Rate		0.05	0.10	0.19	0.20	0.17	0.36
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		216	216	2221	1052	336	3068
d1, Uniform Delay [s]		44.82	47.31	11.72	11.88	43.63	3.16
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.26	8.00	0.39	0.89	8.08	0.46
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.41	0.83	0.33	0.34	0.89	0.44
d, Delay for Lane Group [s/veh]		46.08	55.30	12.11	12.77	51.70	3.62
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.32	5.25	4.50	4.70	8.63	3.33
50th-Percentile Queue Length [ft/ln]		58.09	131.28	112.54	117.50	215.72	83.17
95th-Percentile Queue Length [veh/ln]		4.18	9.01	7.98	8.26	13.45	5.99
95th-Percentile Queue Length [ft/ln]		104.57	225.24	199.53	206.39	336.16	149.71

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	46.08	46.08	55.30	0.00	12.13	12.77	51.70	3.62	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			52.24			12.33			12.34		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	15.90											
Intersection LOS	B											
Intersection V/C	0.524											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.057	1.855	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	400	291	1455
d_b, Bicycle Delay [s]	55.00	35.20	40.16	4.09
I_b,int, Bicycle LOS Score for Intersection	4.132	2.002	2.156	2.919
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	666	0	463	0	0	0	128	712	0	0	937	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	666	0	463	0	0	0	128	712	0	0	937	179
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	167	0	116	0	0	0	32	178	0	0	234	45
Total Analysis Volume [veh/h]	666	0	463	0	0	0	128	712	0	0	937	179
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	79	0	0	0	0	0	10	31	0	0	21	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		10	75	61	61
g / C, Green / Cycle	0.25	0.25	0.25		0.09	0.68	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.07	0.19	0.29	0.31
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	444	444	444		160	2586	1055	999
d1, Uniform Delay [s]	39.45	39.45	39.45		49.12	6.90	15.40	15.77
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.57	4.57	4.57		8.76	0.26	1.90	2.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.80	0.28	0.53	0.56
d, Delay for Lane Group [s/veh]	44.02	44.02	44.02		57.88	7.17	17.30	18.02
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.14	10.14	10.14		3.83	3.11	9.01	9.28
50th-Percentile Queue Length [ft/ln]	253.52	253.52	253.52		95.71	77.69	225.33	232.05
95th-Percentile Queue Length [veh/ln]	15.36	15.36	15.36		6.89	5.59	13.94	14.28
95th-Percentile Queue Length [ft/ln]	384.08	384.08	384.08		172.27	139.84	348.42	356.96

**Movement, Approach, & Intersection Results**

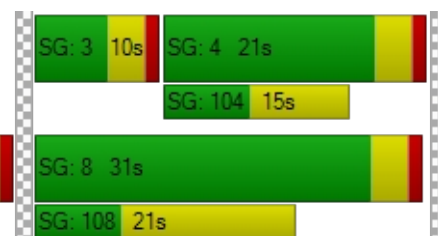
d_M, Delay for Movement [s/veh]	44.02	0.00	44.02	0.00	0.00	0.00	57.88	7.17	0.00	0.00	17.59	18.02
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	44.02			0.00			14.89			17.66		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.56											
Intersection LOS	C											
Intersection V/C	0.662											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.317	1.732	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	491	309
d_b, Bicycle Delay [s]	55.00	55.00	31.31	39.31
I_b,int, Bicycle LOS Score for Intersection	5.995	4.132	2.253	2.480
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 15: Lemon Street at Wilshire Avenue

Control Type:	Signalized	Delay (sec / veh):	5.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.252

#### Intersection Setup

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	32	710	17	7	598	23	13	26	26	19	18	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	710	17	7	598	23	13	26	26	19	18	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	178	4	2	150	6	3	7	7	5	5	6
Total Analysis Volume [veh/h]	32	710	17	7	598	23	13	26	26	19	18	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.20	0.00	0.17	0.17	0.04	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1560	1671	1583	1551	1671	1583	125	129
d1, Uniform Delay [s]	0.81	1.00	0.99	0.80	0.96	0.96	51.70	51.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.31	0.33	0.01	0.26	0.27	3.29	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.22	0.22	0.00	0.19	0.19	0.52	0.46
d, Delay for Lane Group [s/veh]	0.84	1.31	1.32	0.81	1.22	1.22	54.99	54.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.04	0.51	0.49	0.01	0.42	0.40	1.88	1.72
50th-Percentile Queue Length [ft/ln]	0.91	12.87	12.26	0.20	10.62	10.07	47.04	42.98
95th-Percentile Queue Length [veh/ln]	0.07	0.93	0.88	0.01	0.76	0.73	3.39	3.09
95th-Percentile Queue Length [ft/ln]	1.63	23.17	22.07	0.35	19.12	18.13	84.68	77.37

**Movement, Approach, & Intersection Results**

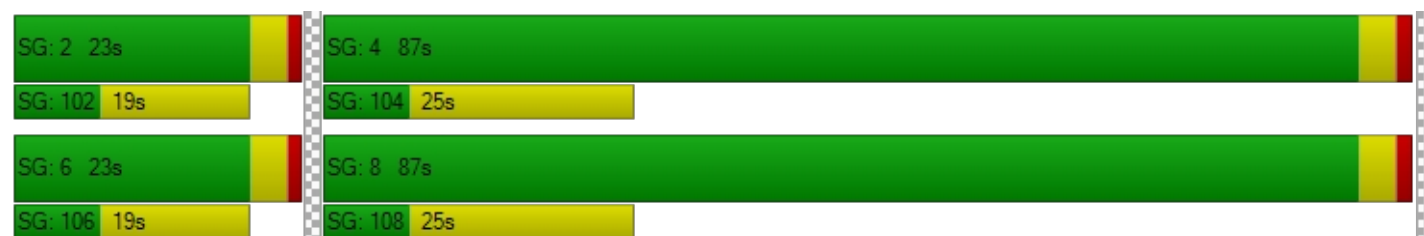
d_M, Delay for Movement [s/veh]	0.84	1.31	1.32	0.81	1.22	1.22	54.99	54.99	54.99	54.14	54.14	54.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.29			1.22			54.99			54.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.67											
Intersection LOS	A											
Intersection V/C	0.252											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.610			2.596			1.837			1.788		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.186			2.078			1.667			1.659		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.597

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	97	1000	183	87	961	100	147	433	128	201	522	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	1000	183	87	961	100	147	433	128	201	522	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	250	46	22	240	25	37	108	32	50	131	21
Total Analysis Volume [veh/h]	97	1000	183	87	961	100	147	433	128	201	522	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	28	57	0	14	33	0	10	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	45	36	36	45	36	36	57	44	44	57	46	46
g / C, Green / Cycle	0.41	0.32	0.32	0.41	0.32	0.32	0.52	0.40	0.40	0.52	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.05	0.26	0.10	0.05	0.29	0.28	0.08	0.11	0.07	0.11	0.14	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	339	1233	584	404	615	582	852	1505	713	881	1577	747
d1, Uniform Delay [s]	20.11	34.08	27.95	19.99	35.54	35.07	14.08	22.66	21.62	14.55	21.83	19.76
k, delay calibration	0.11	0.11	0.11	0.11	0.17	0.16	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.46	1.33	0.30	0.26	7.76	5.95	0.10	0.48	0.55	0.60	0.56	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.29	0.81	0.31	0.22	0.90	0.87	0.17	0.29	0.18	0.23	0.33	0.11
d, Delay for Lane Group [s/veh]	20.57	35.41	28.25	20.25	43.30	41.02	14.17	23.14	22.17	15.15	22.39	20.07
Lane Group LOS	C	D	C	C	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.59	12.28	3.67	1.41	15.23	13.54	1.93	3.90	2.25	2.84	4.65	1.40
50th-Percentile Queue Length [ft/ln]	39.78	307.08	91.70	35.24	380.69	338.39	48.26	97.56	56.33	71.11	116.34	35.00
95th-Percentile Queue Length [veh/ln]	2.86	18.03	6.60	2.54	21.63	19.57	3.47	7.02	4.06	5.12	8.19	2.52
95th-Percentile Queue Length [ft/ln]	71.60	450.77	165.07	63.44	540.68	489.24	86.87	175.61	101.39	128.00	204.79	63.00

**Movement, Approach, & Intersection Results**

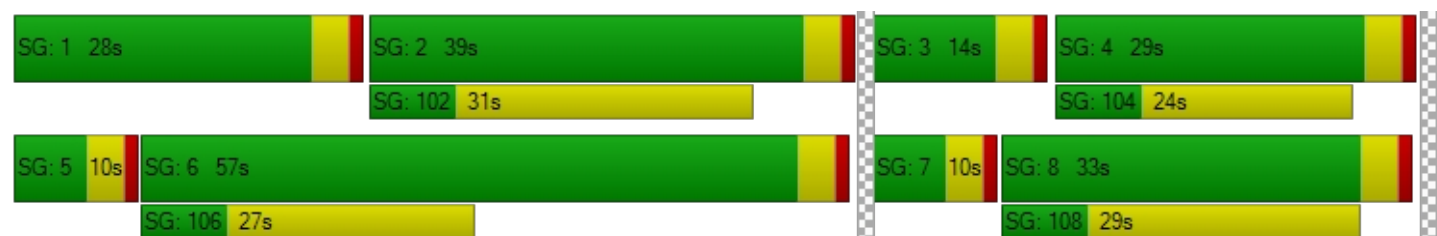
d_M, Delay for Movement [s/veh]	20.57	35.41	28.25	20.25	42.33	41.02	14.17	23.14	22.17	15.15	22.39	20.07
Movement LOS	C	D	C	C	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.26			40.54			21.10			20.35		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.55											
Intersection LOS	C											
Intersection V/C	0.597											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.999			2.864			2.741			2.750		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			964			527			455		
d_b, Bicycle Delay [s]	25.57			14.77			29.82			32.84		
I_b,int, Bicycle LOS Score for Intersection	2.616			2.507			2.144			2.226		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	149	633	235	47	567	70	100	506	110	233	659	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	633	235	47	567	70	100	506	110	233	659	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	158	59	12	142	18	25	127	28	58	165	16
Total Analysis Volume [veh/h]	149	633	235	47	567	70	100	506	110	233	659	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	31	45	0	25	39	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	35	27	27	35	22	22	8	53	53	10	55	55
g / C, Green / Cycle	0.32	0.24	0.24	0.32	0.20	0.20	0.07	0.48	0.48	0.09	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.08	0.17	0.13	0.03	0.18	0.17	0.06	0.13	0.06	0.07	0.17	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	374	920	436	404	386	365	129	1826	865	313	1893	897
d1, Uniform Delay [s]	27.68	37.95	36.37	26.07	42.40	42.09	50.21	17.13	15.82	48.90	16.77	14.38
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.69	0.93	1.04	0.13	5.82	4.97	9.35	0.38	0.30	3.51	0.51	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.40	0.69	0.54	0.12	0.86	0.83	0.77	0.28	0.13	0.74	0.35	0.07
d, Delay for Lane Group [s/veh]	28.36	38.87	37.41	26.19	48.23	47.05	59.55	17.51	16.12	52.41	17.28	14.53
Lane Group LOS	C	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.98	7.82	5.61	0.88	9.30	8.37	3.04	3.88	1.59	3.27	5.09	0.86
50th-Percentile Queue Length [ft/ln]	74.44	195.57	140.23	21.94	232.44	209.20	75.90	97.02	39.80	81.70	127.22	21.58
95th-Percentile Queue Length [veh/ln]	5.36	12.41	9.49	1.58	14.30	13.11	5.46	6.99	2.87	5.88	8.79	1.55
95th-Percentile Queue Length [ft/ln]	133.99	310.24	237.33	39.49	357.45	327.80	136.62	174.64	71.65	147.06	219.71	38.85

**Movement, Approach, & Intersection Results**

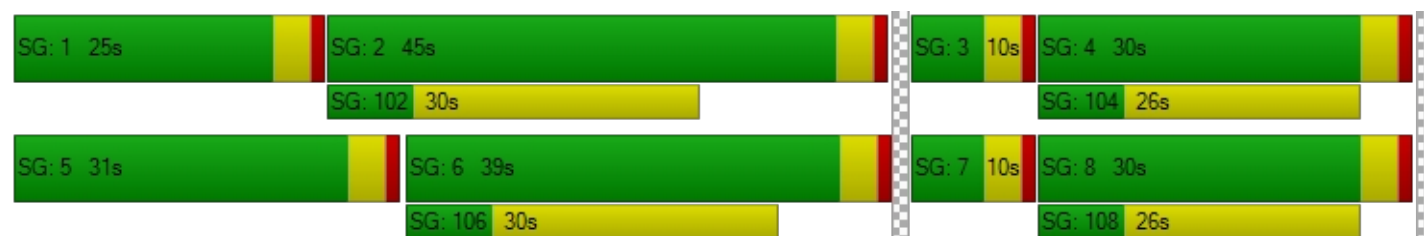
d_M, Delay for Movement [s/veh]	28.36	38.87	37.41	26.19	47.74	47.05	59.55	17.51	16.12	52.41	17.28	14.53
Movement LOS	C	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	37.00			46.19			23.17			25.66		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	32.71											
Intersection LOS	C											
Intersection V/C	0.548											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.776			2.598			2.768			2.864		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			636			473			473		
d_b, Bicycle Delay [s]	21.64			25.57			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.399			2.124			2.150			2.348		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.514

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	65	1315	48	42	1192	42	47	72	73	77	128	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	1315	48	42	1192	42	47	72	73	77	128	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	329	12	11	298	11	12	18	18	19	32	7
Total Analysis Volume [veh/h]	65	1315	48	42	1192	42	47	72	73	77	128	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	62	0	0	62	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.37	0.37	0.02	0.34	0.33	0.11	0.04	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1284	1523	1443	1254	1523	1443	266	74	226
d1, Uniform Delay [s]	2.24	3.43	3.41	2.21	3.25	3.23	47.03	43.82	45.94
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	1.01	1.05	0.05	0.85	0.88	3.66	58.44	3.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.46	0.46	0.03	0.42	0.41	0.72	1.04	0.68
d, Delay for Lane Group [s/veh]	2.31	4.43	4.45	2.26	4.09	4.10	50.69	102.26	49.56
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.24	3.97	3.72	0.15	3.40	3.18	5.39	3.05	4.24
50th-Percentile Queue Length [ft/ln]	6.01	99.23	93.06	3.84	84.97	79.61	134.73	76.25	105.93
95th-Percentile Queue Length [veh/ln]	0.43	7.14	6.70	0.28	6.12	5.73	9.20	5.49	7.61
95th-Percentile Queue Length [ft/ln]	10.83	178.62	167.51	6.92	152.95	143.29	229.91	137.25	190.32

**Movement, Approach, & Intersection Results**

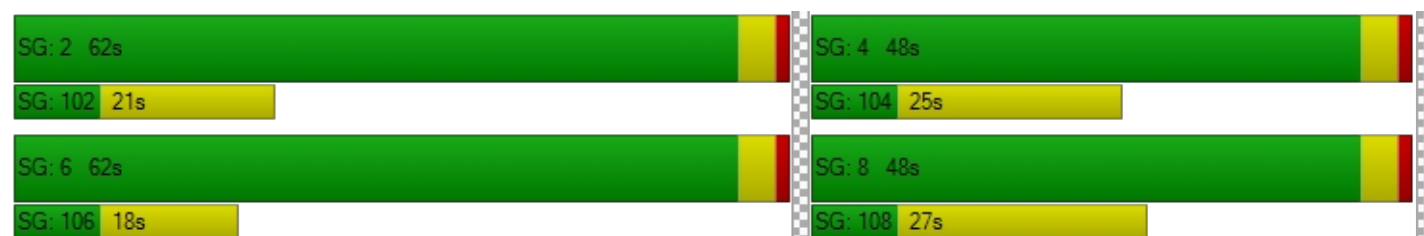
d_M, Delay for Movement [s/veh]	2.31	4.44	4.45	2.26	4.10	4.10	50.69	50.69	50.69	102.26	49.56	49.56
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.35			4.04			50.69			67.12		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.70											
Intersection LOS	B											
Intersection V/C	0.514											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.959			2.896			2.025			2.137		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1055			1055			800			800		
d_b, Bicycle Delay [s]	12.29			12.29			19.80			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.738			2.612			1.876			1.941		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	122	887	76	58	792	74	80	44	141	99	43	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	122	887	76	58	792	74	80	44	141	99	43	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	222	19	15	198	19	20	11	35	25	11	18
Total Analysis Volume [veh/h]	122	887	76	58	792	74	80	44	141	99	43	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	48	0	0	48	0	0	62	0	0	62	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.07	0.26	0.26	0.03	0.24	0.23	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1252	1446	1370	1231	1446	1370	341	347
d1, Uniform Delay [s]	3.36	4.25	4.21	3.23	4.10	4.07	44.73	43.32
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.66	0.67	0.07	0.56	0.57	3.81	1.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.35	0.34	0.05	0.31	0.30	0.78	0.62
d, Delay for Lane Group [s/veh]	3.51	4.91	4.88	3.31	4.67	4.63	48.54	45.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.63	3.27	3.00	0.29	2.84	2.60	7.37	5.68
50th-Percentile Queue Length [ft/ln]	15.81	81.86	74.95	7.24	71.08	64.94	184.16	141.98
95th-Percentile Queue Length [veh/ln]	1.14	5.89	5.40	0.52	5.12	4.68	11.82	9.59
95th-Percentile Queue Length [ft/ln]	28.46	147.35	134.91	13.03	127.94	116.89	295.44	239.68

**Movement, Approach, & Intersection Results**

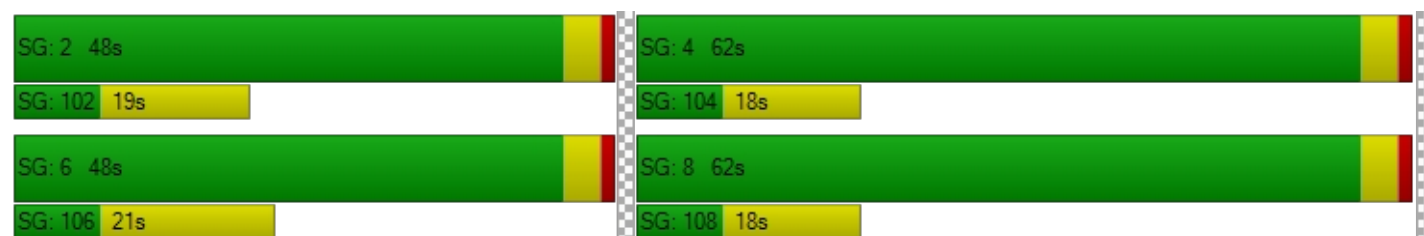
d_M, Delay for Movement [s/veh]	3.51	4.89	4.88	3.31	4.65	4.63	48.54	48.54	48.54	45.14	45.14	45.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.74			4.57			48.54			45.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.83											
Intersection LOS	B											
Intersection V/C	0.443											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.863			2.806			2.144			1.999		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			800			1055			1055		
d_b, Bicycle Delay [s]	19.80			19.80			12.29			12.29		
I_b,int, Bicycle LOS Score for Intersection	2.455			2.322			1.997			1.914		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.798

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	259	1233	285	193	1064	208	250	754	216	225	931	221
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	259	1233	285	193	1064	208	250	754	216	225	931	221
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	308	71	48	266	52	63	189	54	56	233	55
Total Analysis Volume [veh/h]	259	1233	285	193	1064	208	250	754	216	225	931	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	11	40	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	38	38	7	36	36	16	35	35	15	33	33
g / C, Green / Cycle	0.08	0.34	0.34	0.06	0.32	0.32	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.32	0.16	0.06	0.28	0.12	0.14	0.13	0.12	0.13	0.16	0.12
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	286	1297	615	223	1228	582	271	1808	571	238	1705	538
d1, Uniform Delay [s]	50.07	35.32	28.34	51.04	34.79	28.77	46.11	29.56	29.14	47.32	32.29	30.80
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.34	4.74	0.55	9.73	1.79	0.42	12.72	0.71	1.91	16.66	1.26	2.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.95	0.46	0.87	0.85	0.39	0.92	0.42	0.38	0.94	0.55	0.41
d, Delay for Lane Group [s/veh]	60.41	40.05	28.89	60.76	36.58	29.19	58.83	30.27	31.05	63.98	33.55	33.10
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.93	16.59	5.93	2.93	13.18	4.62	7.66	5.32	4.71	7.18	7.07	5.01
50th-Percentile Queue Length [ft/ln]	98.29	414.63	148.25	73.22	329.49	115.50	191.50	133.08	117.81	179.56	176.71	125.27
95th-Percentile Queue Length [veh/ln]	7.08	23.26	9.92	5.27	19.13	8.15	12.20	9.11	8.27	11.58	11.43	8.68
95th-Percentile Queue Length [ft/ln]	176.92	581.60	248.10	131.79	478.34	203.63	304.97	227.67	206.81	289.44	285.72	217.05

**Movement, Approach, & Intersection Results**

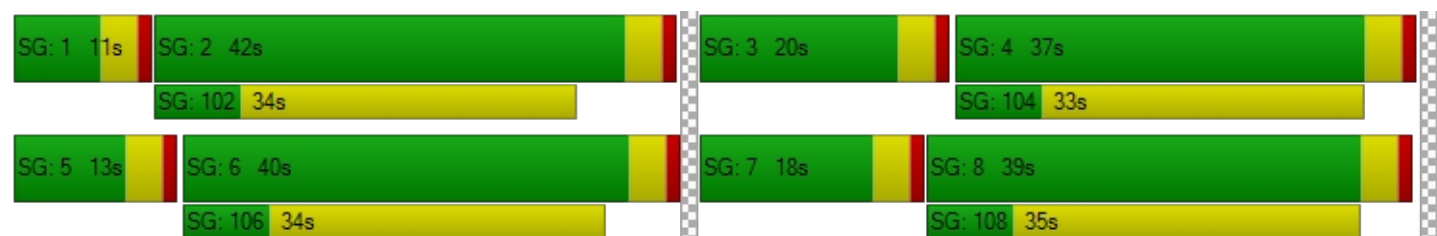
d_M, Delay for Movement [s/veh]	60.41	40.05	28.89	60.76	36.47	29.19	58.83	30.27	31.05	63.98	33.55	33.10
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	41.23			38.63			36.26			38.45		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	38.89											
Intersection LOS	D											
Intersection V/C	0.798											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.135			3.045			3.054			3.053		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			655			636			600		
d_b, Bicycle Delay [s]	23.56			24.89			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.026			2.365			2.231			2.317		
Bicycle LOS	C			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.837

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	285	922	134	197	832	167	206	742	184	218	825	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	285	922	134	197	832	167	206	742	184	218	825	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	231	34	49	208	42	52	186	46	55	206	36
Total Analysis Volume [veh/h]	285	922	134	197	832	167	206	742	184	218	825	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	42	0	21	47	0	13	36	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	31	31	45	29	29	15	44	44	9	38	38
g / C, Green / Cycle	0.41	0.28	0.28	0.41	0.27	0.27	0.13	0.40	0.40	0.08	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.16	0.24	0.07	0.11	0.22	0.09	0.11	0.20	0.10	0.06	0.27	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	472	1075	509	426	1013	480	240	1498	710	294	655	621
d1, Uniform Delay [s]	22.56	37.41	30.61	21.32	37.95	32.67	46.73	25.13	22.52	49.31	32.35	31.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	2.11	0.27	0.78	1.73	0.43	8.62	1.17	0.89	3.69	8.92	7.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.86	0.26	0.46	0.82	0.35	0.86	0.50	0.26	0.74	0.78	0.74
d, Delay for Lane Group [s/veh]	23.81	39.51	30.88	22.11	39.68	33.11	55.35	26.30	23.41	53.00	41.27	39.52
Lane Group LOS	C	D	C	C	D	C	E	C	C	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.28	11.91	2.80	3.43	10.66	3.66	6.07	7.44	3.37	3.07	13.58	11.90
50th-Percentile Queue Length [ft/ln]	131.89	297.82	69.93	85.81	266.54	91.46	151.80	185.95	84.32	76.84	339.42	297.43
95th-Percentile Queue Length [veh/ln]	9.04	17.57	5.04	6.18	16.02	6.58	10.11	11.91	6.07	5.53	19.62	17.55
95th-Percentile Queue Length [ft/ln]	226.06	439.34	125.88	154.46	400.42	164.62	252.82	297.77	151.77	138.32	490.49	438.84

**Movement, Approach, & Intersection Results**

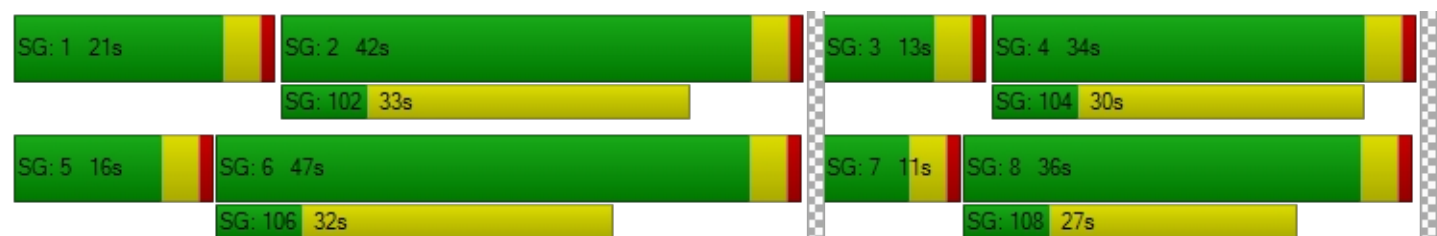
d_M, Delay for Movement [s/veh]	23.81	39.51	30.88	22.11	39.68	33.11	55.35	26.30	23.41	53.00	40.60	39.52
Movement LOS	C	D	C	C	D	C	E	C	C	D	D	D
d_A, Approach Delay [s/veh]	35.31			35.87			31.12			42.75		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	36.29											
Intersection LOS	D											
Intersection V/C	0.837											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.881			2.864			2.969			3.003		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			782			582			545		
d_b, Bicycle Delay [s]	23.56			20.40			27.65			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.666			2.546			2.182			2.540		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	144	1728	0	0	1473	598	0	0	0	228	317	303
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	1728	0	0	1473	598	0	0	0	228	317	303
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	432	0	0	368	150	0	0	0	57	79	76
Total Analysis Volume [veh/h]	144	1728	0	0	1473	598	0	0	0	228	317	303
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	72	62	62		20	20	20
g / C, Green / Cycle	0.06	0.72	0.62	0.62		0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.30	0.36	0.38		0.13	0.08	0.17
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	210	4088	2345	1111		365	771	365
d1, Uniform Delay [s]	46.07	5.74	11.51	11.89		36.39	34.67	38.21
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	3.92	0.32	1.09	2.62		1.75	0.35	4.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.42	0.59	0.62		0.62	0.41	0.83
d, Delay for Lane Group [s/veh]	49.99	6.06	12.61	14.51		38.14	35.02	43.10
Lane Group LOS	D	A	B	B		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.86	4.23	8.75	9.47		5.21	3.37	7.51
50th-Percentile Queue Length [ft/ln]	46.48	105.78	218.69	236.87		130.16	84.21	187.83
95th-Percentile Queue Length [veh/ln]	3.35	7.60	13.60	14.52		8.95	6.06	12.01
95th-Percentile Queue Length [ft/ln]	83.67	190.11	339.95	363.07		223.71	151.58	300.21

**Movement, Approach, & Intersection Results**

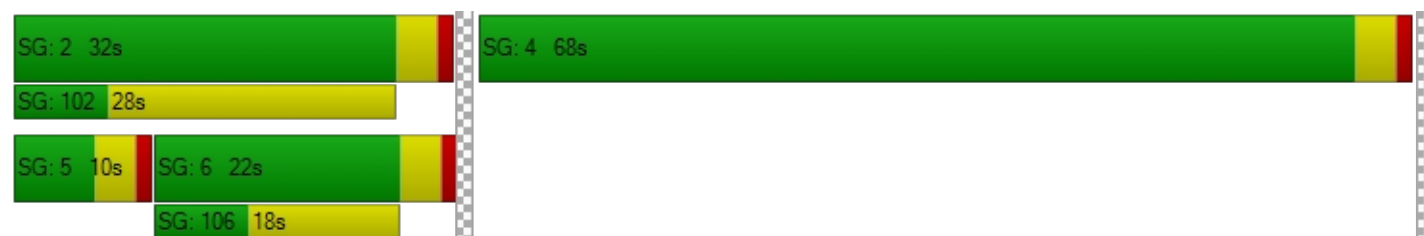
d_M, Delay for Movement [s/veh]	49.99	6.06	0.00	0.00	12.72	14.51	0.00	0.00	0.00	38.14	35.02	43.10
Movement LOS	D	A			B	B				D	D	D
d_A, Approach Delay [s/veh]	9.44			13.24			0.00			38.75		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	16.27											
Intersection LOS	B											
Intersection V/C	0.674											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.236			2.343		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.589			2.699			4.132			2.259		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.765

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	73	962	0	0	1039	269	0	0	0	157	473	703
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	962	0	0	1039	269	0	0	0	157	473	703
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	241	0	0	260	67	0	0	0	39	118	176
Total Analysis Volume [veh/h]	73	962	0	0	1039	269	0	0	0	157	473	703
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	49	40	40		43	43	43
g / C, Green / Cycle	0.05	0.49	0.40	0.40		0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.23	0.24		0.18	0.16	0.39
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	96	2806	1517	718		770	813	770
d1, Uniform Delay [s]	46.73	15.51	23.43	23.82		19.89	19.59	26.86
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.19
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.86	0.33	1.59	3.79		0.35	0.30	7.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.34	0.57	0.61		0.41	0.38	0.91
d, Delay for Lane Group [s/veh]	58.59	15.85	25.02	27.61		20.24	19.89	34.54
Lane Group LOS	E	B	C	C		C	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.10	4.42	8.14	8.69		5.10	4.92	16.65
50th-Percentile Queue Length [ft/ln]	52.44	110.40	203.52	217.31		127.54	123.10	416.24
95th-Percentile Queue Length [veh/ln]	3.78	7.86	12.82	13.53		8.81	8.56	23.34
95th-Percentile Queue Length [ft/ln]	94.40	196.56	320.50	338.19		220.14	214.07	583.53

**Movement, Approach, & Intersection Results**

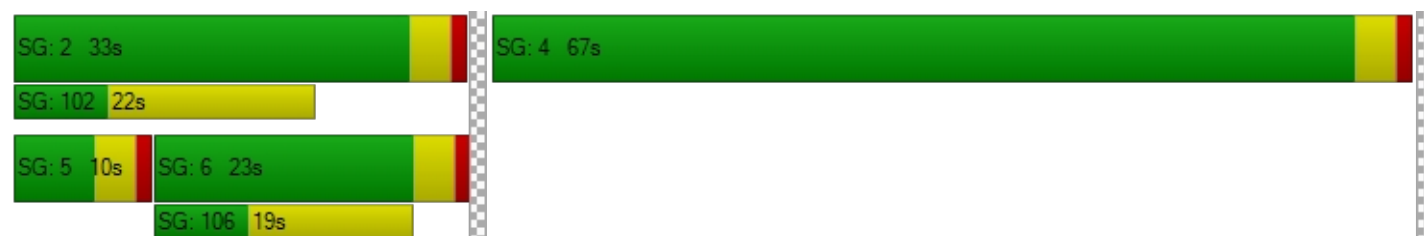
d_M, Delay for Movement [s/veh]	58.59	15.85	0.00	0.00	25.44	27.61	0.00	0.00	0.00	20.24	20.01	34.54
Movement LOS	E	B			C	C				C	C	C
d_A, Approach Delay [s/veh]	18.86			25.88			0.00			27.70		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.56											
Intersection LOS	C											
Intersection V/C	0.765											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.117			2.378		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	2.129			2.279			4.132			2.659		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 24: Harbor Boulevard at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	21.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1000	227	326	1210	0	748	211	181	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1000	227	326	1210	0	748	211	181	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	250	57	82	303	0	187	53	45	0	0	0
Total Analysis Volume [veh/h]	0	1000	227	326	1210	0	748	211	181	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	16	45	0	0	55	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	51	51	11	66	26	26	26	
g / C, Green / Cycle	0.51	0.51	0.11	0.66	0.26	0.26	0.26	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.13	0.09	0.21	0.21	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2912	920	394	3781	898	488	462	
d1, Uniform Delay [s]	14.51	13.69	43.43	7.19	35.15	31.09	30.72	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.32	0.64	4.48	0.22	2.10	0.61	0.54	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.34	0.25	0.83	0.32	0.83	0.43	0.39	
d, Delay for Lane Group [s/veh]	14.83	14.33	47.90	7.42	37.25	31.69	31.27	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.41	2.94	4.16	3.39	8.71	4.30	3.64	
50th-Percentile Queue Length [ft/ln]	110.29	73.56	103.97	84.72	217.82	107.49	91.12	
95th-Percentile Queue Length [veh/ln]	7.86	5.30	7.49	6.10	13.55	7.70	6.56	
95th-Percentile Queue Length [ft/ln]	196.40	132.40	187.14	152.50	338.85	192.50	164.02	

**Movement, Approach, & Intersection Results**

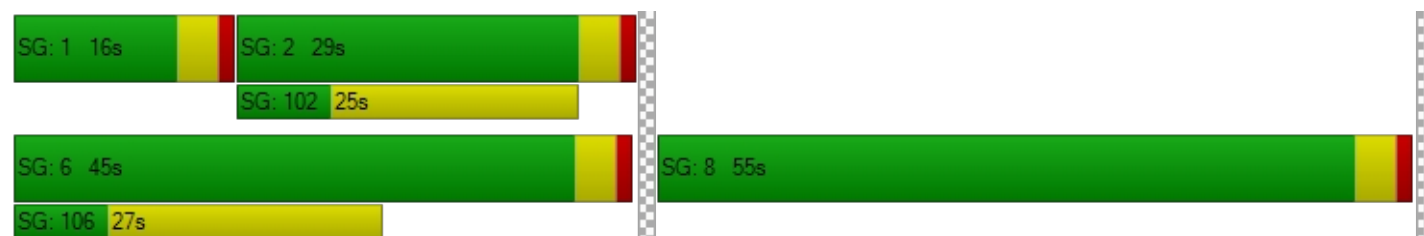
d_M, Delay for Movement [s/veh]	0.00	14.83	14.33	47.90	7.42	0.00	37.25	31.69	31.27	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	14.74			16.01			35.27			0.00		
Approach LOS	B			B			D			A		
d_I, Intersection Delay [s/veh]	21.24											
Intersection LOS	C											
Intersection V/C	0.548											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.414			2.092		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			820			1020			0		
d_b, Bicycle Delay [s]	28.13			17.41			12.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.234			2.404			3.441			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	793	219	456	712	0	204	534	49	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	793	219	456	712	0	204	534	49	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	198	55	114	178	0	51	134	12	0	0	0
Total Analysis Volume [veh/h]	0	793	219	456	712	0	204	534	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	26	49	0	0	51	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	49	49	16	68	24	24	24	
g / C, Green / Cycle	0.49	0.49	0.16	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.19	0.13	0.19	0.21	0.19	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1852	877	544	2594	427	451	427	
d1, Uniform Delay [s]	15.98	16.18	41.02	6.20	36.65	36.03	29.90	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.56	1.28	3.55	0.26	5.55	3.58	0.12	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.38	0.84	0.27	0.87	0.81	0.11	
d, Delay for Lane Group [s/veh]	16.54	17.45	44.57	6.46	42.20	39.61	30.01	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.80	5.02	5.66	2.69	9.23	8.76	0.94	
50th-Percentile Queue Length [ft/ln]	120.00	125.62	141.59	67.33	230.72	218.90	23.40	
95th-Percentile Queue Length [veh/ln]	8.39	8.70	9.57	4.85	14.21	13.61	1.68	
95th-Percentile Queue Length [ft/ln]	209.83	217.52	239.17	121.19	355.27	340.22	42.11	

**Movement, Approach, & Intersection Results**

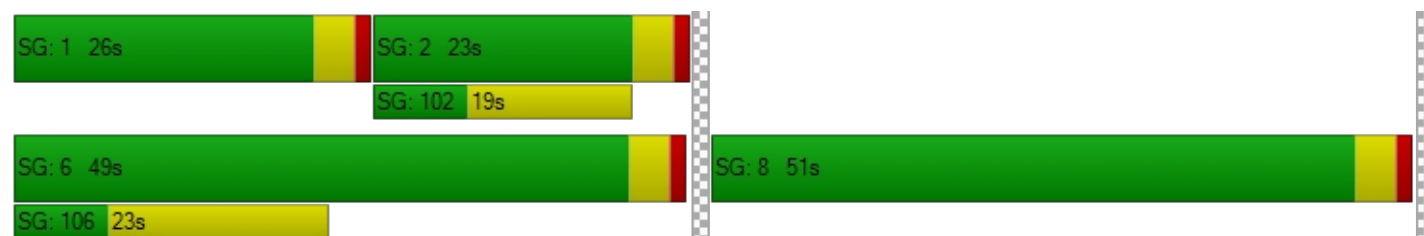
d_M, Delay for Movement [s/veh]	0.00	16.68	17.45	44.57	6.46	0.00	42.20	40.42	30.01	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	16.84			21.34			40.23			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	24.82											
Intersection LOS	C											
Intersection V/C	0.596											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.201			2.309		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			900			940			0		
d_b, Bicycle Delay [s]	32.81			15.13			14.05			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.116			2.523			2.209			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	17	310	12	6	517
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	17	310	12	6	517
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	4	78	3	2	129
Total Analysis Volume [veh/h]	0	17	310	12	6	517
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**


V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	10.05	0.00	0.00	7.92	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.07	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.79	0.00	0.00	0.37	0.00
d_A, Approach Delay [s/veh]	10.05		0.00		0.09	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.25					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.306

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	594	46	88	447	0	91	37	112	29	0	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	594	46	88	447	0	91	37	112	29	0	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	149	12	22	112	0	23	9	28	7	0	5
Total Analysis Volume [veh/h]	0	594	46	88	447	0	91	37	112	29	0	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	37	0	10	47	0	0	63	0	63	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	91	91	11	11	11	11
g / C, Green / Cycle	0.74	0.74	0.82	0.82	0.10	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.17	0.18	0.05	0.12	0.05	0.08	0.02	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1397	1324	1462	3129	222	220	78	187
d1, Uniform Delay [s]	4.63	4.68	1.80	1.94	46.52	48.15	44.89	44.64
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.38	0.43	0.02	0.10	1.21	3.65	2.89	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.23	0.24	0.06	0.14	0.41	0.68	0.37	0.10
d, Delay for Lane Group [s/veh]	5.01	5.11	1.82	2.04	47.73	51.80	47.78	44.87
Lane Group LOS	A	A	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	2.18	0.24	0.68	2.42	4.20	0.79	0.48
50th-Percentile Queue Length [ft/ln]	53.57	54.40	5.97	16.90	60.57	105.07	19.63	12.07
95th-Percentile Queue Length [veh/ln]	3.86	3.92	0.43	1.22	4.36	7.56	1.41	0.87
95th-Percentile Queue Length [ft/ln]	96.42	97.93	10.74	30.43	109.03	189.12	35.33	21.72

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	5.06	5.11	1.82	2.04	0.00	47.73	51.80	51.80	47.78	0.00	44.87
Movement LOS		A	A	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	5.06			2.00			50.26			46.63		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.72											
Intersection LOS	B											
Intersection V/C	0.306											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.680			1.841			2.115		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			782			1073			0		
d_b, Bicycle Delay [s]	26.95			20.40			11.82			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.088			2.001			1.956			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	5	383	232	0	3	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	383	232	0	3	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	96	58	0	1	3
Total Analysis Volume [veh/h]	5	383	232	0	3	12
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	7.71	0.00	0.00	0.00	11.10	9.56
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.06	0.06
95th-Percentile Queue Length [ft/ln]	0.28	0.00	0.00	0.00	1.52	1.52
d_A, Approach Delay [s/veh]	0.10		0.00		9.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.29					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	27	417	236	0	5	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	417	236	0	5	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	104	59	0	1	4
Total Analysis Volume [veh/h]	27	417	236	0	5	15
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**




V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.76	0.00	0.00	0.00	11.68	9.63
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	0.09	0.09
95th-Percentile Queue Length [ft/ln]	1.55	0.00	0.00	0.00	2.14	2.14
d_A, Approach Delay [s/veh]	0.47		0.00		10.14	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.59					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	361	18	30	226	25	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	361	18	30	226	25	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	5	8	57	6	17
Total Analysis Volume [veh/h]	361	18	30	226	25	67
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.04	0.10
d_M, Delay for Movement [s/veh]	0.00	0.00	8.13	0.00	12.04	11.24
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.08	0.00	0.49	0.49
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.96	0.00	12.30	12.30
d_A, Approach Delay [s/veh]	0.00		0.95		11.46	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.79					
Intersection LOS	B					

### Intersection Level Of Service Report

#### Intersection 31: Lemon Street at Parking Structure

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

#### Intersection Setup

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	118	615	22	0	427	8	0	0	80	0	0	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	615	22	0	427	8	0	0	80	0	0	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	154	6	0	107	2	0	0	20	0	0	5
Total Analysis Volume [veh/h]	118	615	22	0	427	8	0	0	80	0	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	8.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.09	0.00	0.00	10.48
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.09
95th-Percentile Queue Length [ft/ln]	8.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.46	0.00	0.00	2.28
d_A, Approach Delay [s/veh]	1.34			0.00			10.09			10.48		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	1.57											
Intersection LOS	B											

*APPENDIX N-II*





**EXISTING FRIDAY DEPARTURE PEAK HOUR**

### Intersection Level Of Service Report

#### Intersection 1: Harbor Boulevard at Bastanchury Road

Control Type:	Signalized	Delay (sec / veh):	31.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.325

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	84	527	69	115	331	117	123	262	31	53	479	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	527	69	115	331	117	123	262	31	53	479	119
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	132	17	29	83	29	31	66	8	13	120	30
Total Analysis Volume [veh/h]	84	527	69	115	331	117	123	262	31	53	479	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	42	0	10	38	0	16	47	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	66	66	6	67	67	9	17	17	5	13	13
g / C, Green / Cycle	0.05	0.60	0.60	0.05	0.60	0.60	0.08	0.15	0.15	0.04	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.02	0.09	0.04	0.03	0.08	0.08	0.07	0.05	0.06	0.02	0.08	0.07
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	179	3427	1082	188	2294	1087	152	589	279	156	656	207
d1, Uniform Delay [s]	50.77	9.65	9.11	50.96	9.39	9.41	49.51	41.42	41.60	51.01	47.06	46.16
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.90	0.10	0.11	3.19	0.12	0.26	9.63	0.32	0.77	1.27	1.58	2.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.15	0.06	0.61	0.13	0.13	0.81	0.33	0.36	0.34	0.73	0.57
d, Delay for Lane Group [s/veh]	52.67	9.74	9.22	54.15	9.51	9.67	59.15	41.74	42.36	52.28	48.64	48.66
Lane Group LOS	D	A	A	D	A	A	E	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.17	1.83	0.70	1.63	1.55	1.54	3.72	2.37	2.47	0.74	4.31	3.22
50th-Percentile Queue Length [ft/ln]	29.29	45.65	17.49	40.81	38.69	38.43	93.07	59.27	61.69	18.40	107.76	80.61
95th-Percentile Queue Length [veh/ln]	2.11	3.29	1.26	2.94	2.79	2.77	6.70	4.27	4.44	1.32	7.72	5.80
95th-Percentile Queue Length [ft/ln]	52.73	82.16	31.48	73.46	69.65	69.18	167.52	106.69	111.04	33.12	192.88	145.10



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	52.67	9.74	9.22	54.15	9.53	9.67	59.15	41.90	42.36	52.28	48.64	48.66
Movement LOS	D	A	A	D	A	A	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	14.99			18.67			47.04			48.94		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	31.23											
Intersection LOS	C											
Intersection V/C	0.325											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.977			2.897			2.756			2.978		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			782			691		
d_b, Bicycle Delay [s]	23.56			26.25			20.40			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.934			1.869			1.788			1.918		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.269

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	17	486	265	36	472	7	20	31	13	334	36	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	486	265	36	472	7	20	31	13	334	36	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	122	66	9	118	2	5	8	3	84	9	0
Total Analysis Volume [veh/h]	17	486	265	36	472	7	20	31	13	334	36	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	71	4	72	72	5	5	5	14	14
g / C, Green / Cycle	0.02	0.64	0.04	0.66	0.66	0.05	0.05	0.05	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.01	0.09	0.02	0.10	0.05	0.01	0.02	0.01	0.10	0.10
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	42	3662	67	2495	1182	86	91	86	229	229
d1, Uniform Delay [s]	53.03	7.70	52.05	7.22	6.85	50.48	50.75	50.28	46.72	46.77
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.27	0.08	6.44	0.13	0.13	1.37	2.21	0.80	6.52	6.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.13	0.53	0.15	0.08	0.23	0.34	0.15	0.80	0.81
d, Delay for Lane Group [s/veh]	59.30	7.77	58.49	7.35	6.99	51.84	52.95	51.09	53.25	53.56
Lane Group LOS	E	A	E	A	A	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.54	1.44	1.10	1.66	0.80	0.56	0.88	0.36	5.30	5.36
50th-Percentile Queue Length [ft/ln]	13.40	36.11	27.40	41.61	20.06	14.08	22.06	9.07	132.49	134.12
95th-Percentile Queue Length [veh/ln]	0.96	2.60	1.97	3.00	1.44	1.01	1.59	0.65	9.08	9.16
95th-Percentile Queue Length [ft/ln]	24.12	65.00	49.32	74.90	36.10	25.35	39.71	16.33	226.88	229.08

**Movement, Approach, & Intersection Results**

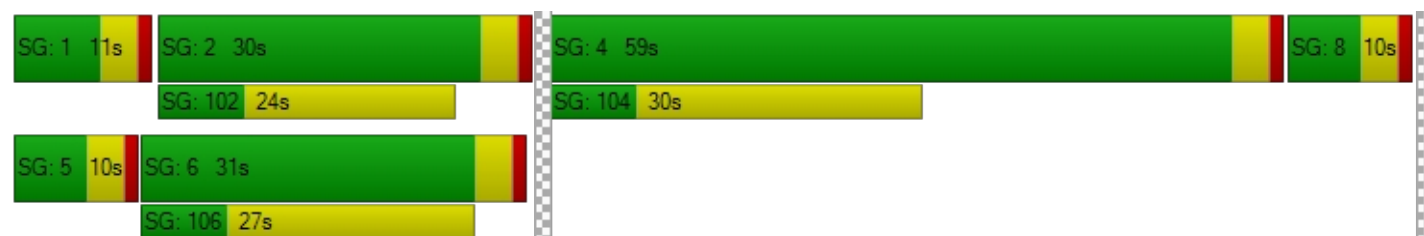
d_M, Delay for Movement [s/veh]	59.30	7.77	0.00	58.49	7.28	6.99	51.84	52.95	51.09	53.39	53.56	0.00
Movement LOS	E	A		E	A	A	D	D	D	D	D	
d_A, Approach Delay [s/veh]	9.51			10.86			52.23			53.41		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	23.06											
Intersection LOS	C											
Intersection V/C	0.269											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.746			2.171			2.092		
Crosswalk LOS	F			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			491			109			1000		
d_b, Bicycle Delay [s]	32.07			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	1.836			1.843			1.665			2.170		
Bicycle LOS	A			A			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 3: Harbor Boulevard at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	17.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.360

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	33	677	37	102	557	5	17	41	26	81	67	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	677	37	102	557	5	17	41	26	81	67	196
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	169	9	26	139	1	4	10	7	20	17	49
Total Analysis Volume [veh/h]	33	677	37	102	557	5	17	41	26	81	67	196
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	12	59	0	14	61	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	75	75	10	81	81	13	13	13	13	13	27
g / C, Green / Cycle	0.04	0.68	0.68	0.09	0.74	0.74	0.12	0.12	0.12	0.12	0.12	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.19	0.03	0.15	0.00	0.01	0.02	0.01	0.05	0.04	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	64	1296	1228	320	2806	1329	187	222	211	210	222	441
d1, Uniform Delay [s]	52.10	6.89	6.86	46.74	4.41	3.77	43.28	43.82	43.50	44.89	44.44	35.18
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.29	0.55	0.57	0.57	0.16	0.01	0.21	0.40	0.26	1.16	0.75	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.29	0.28	0.32	0.20	0.00	0.09	0.18	0.12	0.39	0.30	0.44
d, Delay for Lane Group [s/veh]	58.39	7.44	7.43	47.30	4.57	3.78	43.49	44.21	43.76	46.05	45.19	35.88
Lane Group LOS	E	A	A	D	A	A	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.01	3.33	3.09	1.33	1.73	0.03	0.42	1.03	0.65	2.11	1.72	4.53
50th-Percentile Queue Length [ft/ln]	25.15	83.21	77.35	33.30	43.15	0.69	10.60	25.85	16.27	52.77	42.99	113.18
95th-Percentile Queue Length [veh/ln]	1.81	5.99	5.57	2.40	3.11	0.05	0.76	1.86	1.17	3.80	3.10	8.02
95th-Percentile Queue Length [ft/ln]	45.26	149.77	139.23	59.95	77.66	1.24	19.09	46.52	29.28	94.98	77.38	200.42



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.39	7.44	7.43	47.30	4.57	3.78	43.49	44.21	43.76	46.05	45.19	35.88
Movement LOS	E	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	9.69			11.13			43.93			40.09		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.46											
Intersection LOS	B											
Intersection V/C	0.360											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.700			2.844			2.187			2.412		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1036			600			600		
d_b, Bicycle Delay [s]	13.75			12.77			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.176			2.107			1.698			2.127		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.320

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	200	204	141	18	141	37	11	136	125	77	129	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	204	141	18	141	37	11	136	125	77	129	50
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	51	35	5	35	9	3	34	31	19	32	13
Total Analysis Volume [veh/h]	200	204	141	18	141	37	11	136	125	77	129	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	38	0	0	33	0	0	39	39	0	39	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	10	10	58	10	10	10
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.40	0.09	0.09	0.53	0.09	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.08	0.01	0.10	0.01	0.07	0.07	0.04	0.05	0.05
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	716	716	716	716	716	134	180	953	95	180	171
d1, Uniform Delay [s]	22.36	22.50	21.61	20.11	22.10	45.28	48.48	13.08	47.02	47.35	47.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.95	1.02	0.61	0.06	0.83	0.26	6.27	0.29	14.99	2.32	2.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.29	0.20	0.03	0.25	0.08	0.75	0.13	0.81	0.52	0.50
d, Delay for Lane Group [s/veh]	23.31	23.51	22.22	20.18	22.93	45.54	54.75	13.37	62.00	49.67	49.47
Lane Group LOS	C	C	C	C	C	D	D	B	E	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.62	3.82	2.49	0.29	3.22	0.28	3.94	1.62	2.39	2.57	2.32
50th-Percentile Queue Length [ft/ln]	90.49	95.52	62.29	7.36	80.61	7.10	98.60	40.52	59.71	64.17	57.93
95th-Percentile Queue Length [veh/ln]	6.52	6.88	4.49	0.53	5.80	0.51	7.10	2.92	4.30	4.62	4.17
95th-Percentile Queue Length [ft/ln]	162.88	171.93	112.13	13.25	145.09	12.78	177.48	72.94	107.48	115.51	104.27

**Movement, Approach, & Intersection Results**

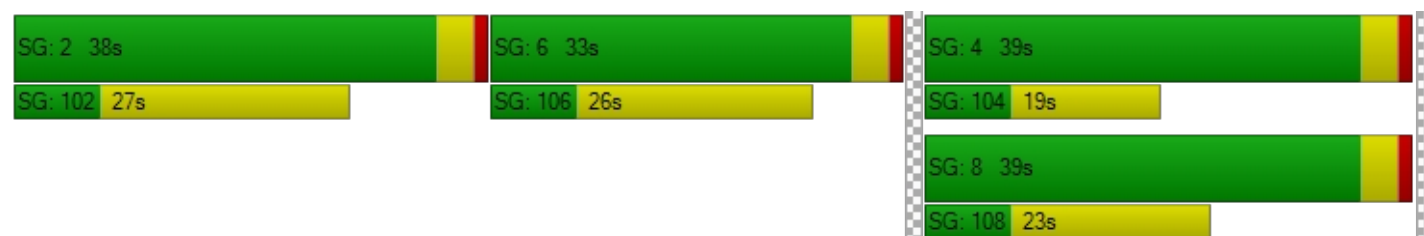
d_M, Delay for Movement [s/veh]	23.31	23.51	22.22	20.18	22.93	22.93	45.54	54.75	13.37	62.00	49.62	49.47
Movement LOS	C	C	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	23.11			22.67			35.36			53.32		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	31.76											
Intersection LOS	C											
Intersection V/C	0.320											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.467			2.115			2.434			2.275		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	618			527			636			636		
d_b, Bicycle Delay [s]	26.25			29.82			25.57			25.57		
I_b,int, Bicycle LOS Score for Intersection	2.459			1.883			2.008			1.771		
Bicycle LOS	B			A			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.156

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	90	10	168	180	142	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	10	168	180	142	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	42	45	36	7
Total Analysis Volume [veh/h]	90	10	168	180	142	26
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	95	95	95	95
g / C, Green / Cycle	0.07	0.07	0.86	0.86	0.86	0.86
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	0.09	0.09	0.07	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	119	119	1546	1636	1636	1550
d1, Uniform Delay [s]	50.40	48.15	1.17	1.17	1.15	1.08
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.27	0.30	0.14	0.14	0.10	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.08	0.11	0.11	0.09	0.02
d, Delay for Lane Group [s/veh]	59.67	48.45	1.31	1.31	1.25	1.10
Lane Group LOS	E	D	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.73	0.27	0.31	0.33	0.26	0.04
50th-Percentile Queue Length [ft/ln]	68.37	6.69	7.81	8.29	6.40	1.11
95th-Percentile Queue Length [veh/ln]	4.92	0.48	0.56	0.60	0.46	0.08
95th-Percentile Queue Length [ft/ln]	123.07	12.04	14.06	14.93	11.52	2.00



**Movement, Approach, & Intersection Results**

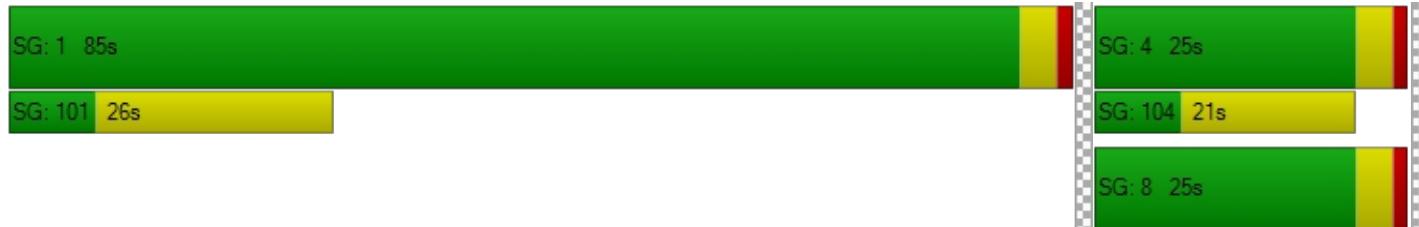
d_M, Delay for Movement [s/veh]	59.67	48.45	1.31	1.31	1.25	1.10
Movement LOS	E	D	A	A	A	A
d_A, Approach Delay [s/veh]	58.55		1.31		1.23	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	10.58					
Intersection LOS	B					
Intersection V/C	0.156					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.284	2.112	2.092
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.707	4.410
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 6: Euclid Street at Malvern Avenue

Control Type:	Signalized	Delay (sec / veh):	25.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.370

#### Intersection Setup

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	78	531	91	38	454	16	18	229	97	95	351	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	531	91	38	454	16	18	229	97	95	351	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	133	23	10	114	4	5	57	24	24	88	15
Total Analysis Volume [veh/h]	78	531	91	38	454	16	18	229	97	95	351	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	30	0	10	29	0	10	31	0	39	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	79	71	71	79	69	69	23	13	13	23	17	17
g / C, Green / Cycle	0.72	0.64	0.64	0.72	0.63	0.63	0.21	0.11	0.11	0.21	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.16	0.02	0.13	0.13	0.01	0.09	0.09	0.05	0.11	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1273	1217	1153	1234	1195	1132	288	218	206	325	288	273
d1, Uniform Delay [s]	4.66	8.59	8.50	4.55	8.70	8.69	34.54	47.47	47.18	36.10	44.69	44.47
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.54	0.54	0.01	0.38	0.40	0.09	6.38	5.24	0.49	3.84	3.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.27	0.26	0.03	0.20	0.20	0.06	0.79	0.74	0.29	0.75	0.72
d, Delay for Lane Group [s/veh]	4.75	9.13	9.04	4.56	9.08	9.09	34.63	53.84	52.42	36.59	48.53	47.98
Lane Group LOS	A	A	A	A	A	A	C	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.51	3.37	3.02	0.23	2.47	2.32	0.39	4.98	4.36	2.17	5.89	5.32
50th-Percentile Queue Length [ft/ln]	12.63	84.26	75.47	5.71	61.80	58.07	9.83	124.40	108.98	54.34	147.18	132.97
95th-Percentile Queue Length [veh/ln]	0.91	6.07	5.43	0.41	4.45	4.18	0.71	8.63	7.78	3.91	9.87	9.10
95th-Percentile Queue Length [ft/ln]	22.74	151.68	135.84	10.28	111.23	104.53	17.69	215.86	194.58	97.81	246.66	227.53

**Movement, Approach, & Intersection Results**

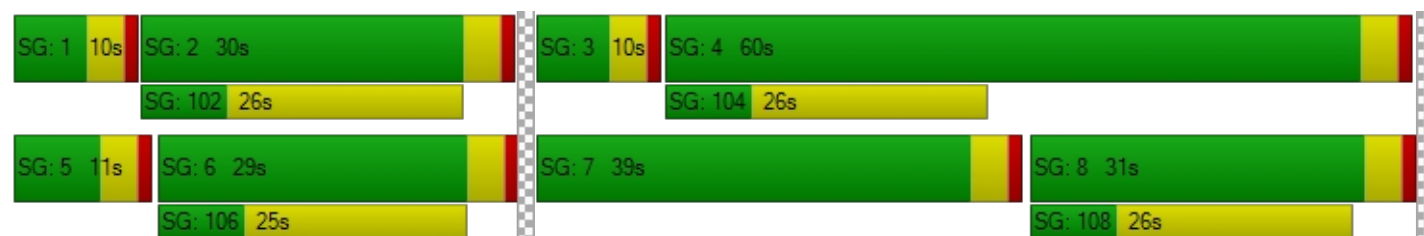
d_M, Delay for Movement [s/veh]	4.75	9.10	9.04	4.56	9.09	9.09	34.63	53.49	52.42	36.59	48.31	47.98
Movement LOS	A	A	A	A	A	A	C	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.60			8.75			52.20			46.07		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	25.13											
Intersection LOS	C											
Intersection V/C	0.370											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.590			2.531			2.535			2.513		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			455			491			1018		
d_b, Bicycle Delay [s]	32.07			32.84			31.31			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.137			1.979			1.843			1.976		
Bicycle LOS	B			A			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 7: Harbor Boulevard at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.425

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	91	540	98	95	552	102	109	293	70	130	380	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	540	98	95	552	102	109	293	70	130	380	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	135	25	24	138	26	27	73	18	33	95	23
Total Analysis Volume [veh/h]	91	540	98	95	552	102	109	293	70	130	380	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	45	0	11	45	0	10	33	0	21	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	76	66	66	76	66	66	26	14	14	26	16	16
g / C, Green / Cycle	0.69	0.60	0.60	0.69	0.60	0.60	0.24	0.13	0.13	0.24	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.05	0.18	0.17	0.05	0.18	0.17	0.06	0.10	0.10	0.07	0.10	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	1161	1137	1077	1166	1137	1078	364	240	227	359	565	268
d1, Uniform Delay [s]	5.68	10.79	10.68	5.69	10.83	10.71	33.82	46.73	46.47	34.24	44.33	42.00
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.66	0.65	0.03	0.69	0.67	0.46	5.97	5.09	0.61	1.40	0.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.30	0.28	0.08	0.30	0.29	0.30	0.80	0.76	0.36	0.67	0.34
d, Delay for Lane Group [s/veh]	5.81	11.46	11.33	5.72	11.52	11.38	34.27	52.70	51.56	34.86	45.73	42.73
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.68	4.03	3.60	0.68	4.16	3.70	2.41	5.46	4.85	2.91	5.00	2.25
50th-Percentile Queue Length [ft/ln]	17.04	100.82	89.88	16.96	103.89	92.43	60.20	136.52	121.30	72.83	124.90	56.18
95th-Percentile Queue Length [veh/ln]	1.23	7.26	6.47	1.22	7.48	6.66	4.33	9.29	8.46	5.24	8.66	4.05
95th-Percentile Queue Length [ft/ln]	30.68	181.48	161.79	30.53	187.01	166.38	108.35	232.33	211.62	131.10	216.55	101.13



**Movement, Approach, & Intersection Results**

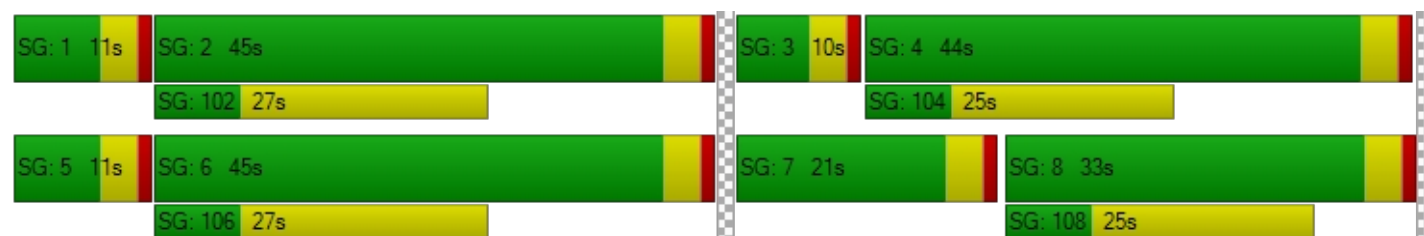
d_M, Delay for Movement [s/veh]	5.81	11.41	11.33	5.72	11.47	11.38	34.27	52.30	51.56	34.86	45.73	42.73
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	10.70			10.73			48.03			42.93		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	25.20											
Intersection LOS	C											
Intersection V/C	0.425											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.625			2.625			2.593			2.722		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			527			727		
d_b, Bicycle Delay [s]	21.64			21.64			29.82			22.27		
I_b,int, Bicycle LOS Score for Intersection	2.161			2.178			1.949			2.055		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.339

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	92	230	53	136	277	171	67	385	63	66	394	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	230	53	136	277	171	67	385	63	66	394	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	58	13	34	69	43	17	96	16	17	99	9
Total Analysis Volume [veh/h]	92	230	53	136	277	171	67	385	63	66	394	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	16	58	0	10	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	77	67	67	77	67	67	5	16	16	5	16	16
g / C, Green / Cycle	0.70	0.60	0.60	0.70	0.61	0.61	0.05	0.15	0.15	0.05	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.03	0.08	0.13	0.11	0.04	0.12	0.12	0.02	0.10	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1231	2295	1087	1291	1152	1091	88	281	267	169	559	265
d1, Uniform Delay [s]	5.41	9.20	8.90	5.55	9.79	9.63	51.70	45.58	45.33	50.83	44.67	40.85
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.09	0.08	0.04	0.42	0.38	12.34	6.37	5.52	1.47	1.64	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.10	0.05	0.11	0.21	0.19	0.76	0.83	0.80	0.39	0.70	0.14
d, Delay for Lane Group [s/veh]	5.53	9.28	8.99	5.59	10.21	10.01	64.04	51.94	50.85	52.30	46.31	41.09
Lane Group LOS	A	A	A	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.66	1.15	0.53	0.96	2.68	2.22	2.13	6.69	6.02	0.92	5.22	0.87
50th-Percentile Queue Length [ft/ln]	16.59	28.83	13.19	23.96	66.89	55.62	53.16	167.37	150.52	22.91	130.62	21.73
95th-Percentile Queue Length [veh/ln]	1.19	2.08	0.95	1.73	4.82	4.00	3.83	10.94	10.04	1.65	8.97	1.56
95th-Percentile Queue Length [ft/ln]	29.87	51.90	23.75	43.13	120.41	100.11	95.68	273.46	251.12	41.25	224.34	39.11

**Movement, Approach, & Intersection Results**

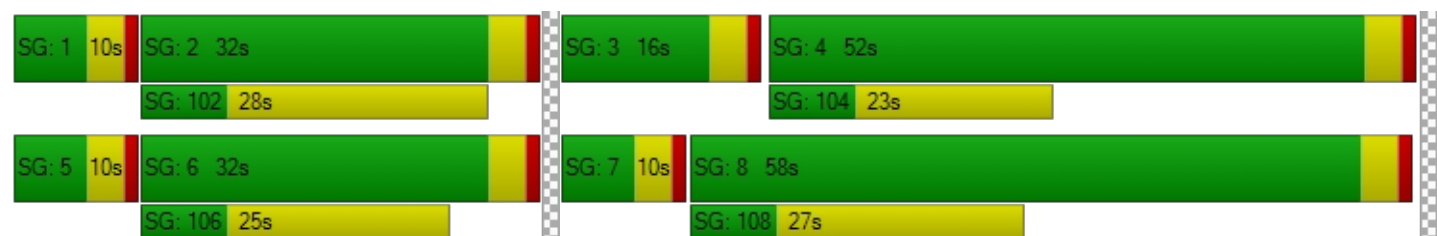
d_M, Delay for Movement [s/veh]	5.53	9.28	8.99	5.59	10.18	10.01	64.04	51.51	50.85	52.30	46.31	41.09
Movement LOS	A	A	A	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.32			9.06			53.06			46.72		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	29.91											
Intersection LOS	C											
Intersection V/C	0.339											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.589			2.488			2.620			2.873		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			873		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.869			2.041			1.984			1.969		
Bicycle LOS	A			B			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 9: Berkeley Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

#### Intersection Setup

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

#### Volumes

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	9	13	18	143	15	34	16	559	10	24	596	128
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	13	18	143	15	34	16	559	10	24	596	128
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	5	36	4	9	4	140	3	6	149	32
Total Analysis Volume [veh/h]	9	13	18	143	15	34	16	559	10	24	596	128
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	7	15	87	87	87	80	80	91
g / C, Green / Cycle	0.04	0.04	0.04	0.06	0.14	0.79	0.79	0.79	0.73	0.73	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.04	0.03	0.01	0.15	0.15	0.01	0.16	0.07
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	67	74	70	225	252	1414	1496	1418	1266	2772	1495
d1, Uniform Delay [s]	51.07	51.17	51.33	50.22	41.86	2.51	2.94	2.93	4.08	4.77	1.71
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.89	1.11	1.90	2.94	0.37	0.00	0.29	0.31	0.03	0.18	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.18	0.26	0.63	0.19	0.01	0.20	0.19	0.02	0.21	0.09
d, Delay for Lane Group [s/veh]	51.96	52.28	53.23	53.15	42.23	2.51	3.23	3.24	4.11	4.95	1.73
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.26	0.37	0.52	2.01	1.21	0.06	1.37	1.29	0.14	1.96	0.33
50th-Percentile Queue Length [ft/ln]	6.41	9.24	12.97	50.22	30.15	1.48	34.18	32.33	3.50	49.07	8.13
95th-Percentile Queue Length [veh/ln]	0.46	0.67	0.93	3.62	2.17	0.11	2.46	2.33	0.25	3.53	0.59
95th-Percentile Queue Length [ft/ln]	11.53	16.64	23.34	90.40	54.26	2.67	61.52	58.20	6.30	88.33	14.63



**Movement, Approach, & Intersection Results**

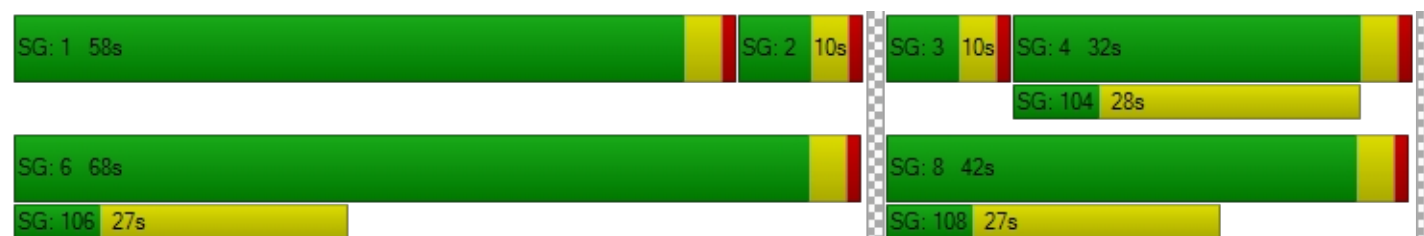
d_M, Delay for Movement [s/veh]	51.96	52.28	53.23	53.15	42.23	42.23	2.51	3.23	3.24	4.11	4.95	1.73
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.64			50.37			3.21			4.37		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.82											
Intersection LOS	B											
Intersection V/C	0.236											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.196	2.243	2.561	0.000
Crosswalk LOS	B	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	109	1164	691	509
d_b, Bicycle Delay [s]	49.16	9.62	23.56	30.56
I_b,int, Bicycle LOS Score for Intersection	1.626	1.876	2.042	2.177
Bicycle LOS	A	A	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 10: Raymond Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	14.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.316

#### Intersection Setup

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	75	57	76	41	52	35	45	622	77	91	618	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	57	76	41	52	35	45	622	77	91	618	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	14	19	10	13	9	11	156	19	23	155	9
Total Analysis Volume [veh/h]	75	57	76	41	52	35	45	622	77	91	618	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	30	0	24	42	0	18	42	0	14	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	15	7	7	15	6	6	87	77	77	87	78	78
g / C, Green / Cycle	0.14	0.06	0.06	0.14	0.05	0.05	0.79	0.70	0.70	0.79	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.04	0.03	0.04	0.02	0.02	0.02	0.03	0.19	0.19	0.05	0.18	0.17
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	314	121	114	303	100	95	1383	1329	1259	1368	1348	1277
d1, Uniform Delay [s]	42.50	49.76	50.40	41.68	50.61	50.57	2.55	6.16	6.11	2.62	5.65	5.63
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.39	2.84	6.44	0.20	3.19	3.16	0.01	0.51	0.51	0.09	0.45	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.24	0.47	0.66	0.14	0.45	0.44	0.03	0.28	0.26	0.07	0.25	0.25
d, Delay for Lane Group [s/veh]	42.89	52.60	56.84	41.88	53.80	53.73	2.56	6.68	6.62	2.71	6.10	6.09
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.87	1.61	2.25	1.00	1.30	1.19	0.17	3.03	2.75	0.38	2.62	2.44
50th-Percentile Queue Length [ft/ln]	46.70	40.22	56.21	25.00	32.59	29.82	4.23	75.72	68.69	9.49	65.49	60.88
95th-Percentile Queue Length [veh/ln]	3.36	2.90	4.05	1.80	2.35	2.15	0.30	5.45	4.95	0.68	4.72	4.38
95th-Percentile Queue Length [ft/ln]	84.06	72.39	101.17	45.01	58.67	53.67	7.61	136.30	123.64	17.08	117.88	109.58

**Movement, Approach, & Intersection Results**

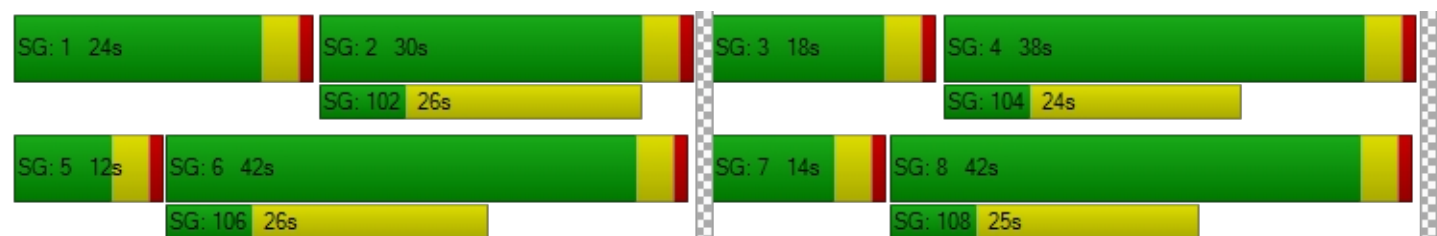
d_M, Delay for Movement [s/veh]	42.89	52.60	56.84	41.88	53.79	53.73	2.56	6.66	6.62	2.71	6.09	6.09
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	50.65			49.96			6.40			5.68		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	14.21											
Intersection LOS	B											
Intersection V/C	0.316											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.486			2.252			2.604			2.603		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			691			691			618		
d_b, Bicycle Delay [s]	32.07			23.56			23.56			26.25		
I_b,int, Bicycle LOS Score for Intersection	1.903			1.665			2.173			2.173		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.234

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	25	24	31	31	19	19	24	596	24	45	656	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	24	31	31	19	19	24	596	24	45	656	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	6	8	8	5	5	6	149	6	11	164	7
Total Analysis Volume [veh/h]	25	24	31	31	19	19	24	596	24	45	656	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	68	0	11	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	88	88	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.88	0.80	0.80	0.88	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.02	0.02	0.02	0.01	0.17	0.17	0.03	0.19	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	90	95	90	105	90	1589	1519	1439	1594	1543	1461
d1, Uniform Delay [s]	50.30	50.24	50.47	50.47	50.68	0.84	2.66	2.65	0.85	2.39	2.38
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.67	1.36	2.23	1.56	3.08	0.00	0.32	0.33	0.03	0.35	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.25	0.34	0.30	0.42	0.02	0.21	0.21	0.03	0.23	0.23
d, Delay for Lane Group [s/veh]	51.97	51.60	52.70	52.04	53.76	0.85	2.98	2.98	0.89	2.74	2.74
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.70	0.67	0.88	0.87	1.09	0.02	1.38	1.29	0.05	1.38	1.30
50th-Percentile Queue Length [ft/ln]	17.61	16.79	22.01	21.75	27.30	0.57	34.44	32.31	1.36	34.53	32.39
95th-Percentile Queue Length [veh/ln]	1.27	1.21	1.58	1.57	1.97	0.04	2.48	2.33	0.10	2.49	2.33
95th-Percentile Queue Length [ft/ln]	31.69	30.22	39.62	39.15	49.15	1.02	61.99	58.16	2.45	62.16	58.30



**Movement, Approach, & Intersection Results**

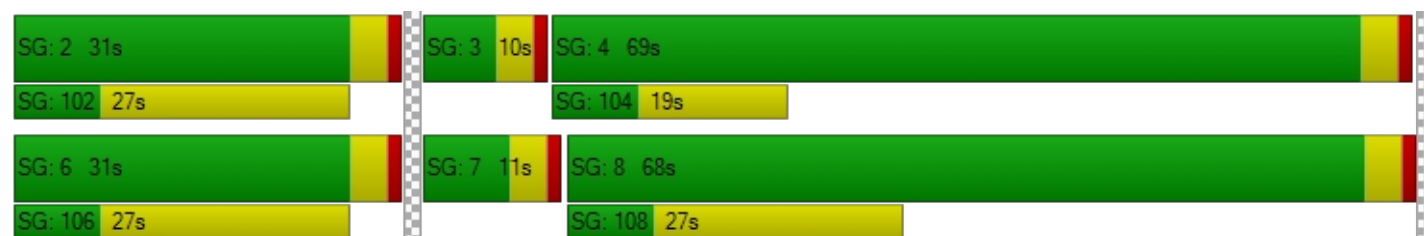
d_M, Delay for Movement [s/veh]	51.97	51.60	52.70	52.04	53.76	53.76	0.85	2.98	2.98	0.89	2.74	2.74
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.14			52.98			2.90			2.62		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.63											
Intersection LOS	A											
Intersection V/C	0.234											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.234			2.025			2.607			2.624		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1164			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.62			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.692			1.673			2.091			2.159		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.380

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	91	273	92	110	310	192	156	400	63	113	498	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	273	92	110	310	192	156	400	63	113	498	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	68	23	28	78	48	39	100	16	28	125	34
Total Analysis Volume [veh/h]	91	273	92	110	310	192	156	400	63	113	498	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	14	37	37	10	49	0	13	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	65	65	6	63	74	6	15	15	9	18	18
g / C, Green / Cycle	0.06	0.59	0.59	0.05	0.58	0.67	0.05	0.14	0.14	0.08	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.05	0.03	0.08	0.11	0.04	0.11	0.04	0.06	0.13	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	116	2229	1056	187	2187	1201	194	518	246	141	605	287
d1, Uniform Delay [s]	50.76	10.14	9.92	50.92	10.80	6.82	51.42	45.89	42.55	49.90	44.77	42.11
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.01	0.11	0.16	2.91	0.14	0.06	7.64	2.48	0.55	10.05	2.87	1.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.12	0.09	0.59	0.14	0.16	0.81	0.77	0.26	0.80	0.82	0.48
d, Delay for Lane Group [s/veh]	61.76	10.25	10.08	53.83	10.93	6.88	59.06	48.36	43.09	59.95	47.65	43.34
Lane Group LOS	E	B	B	D	B	A	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.82	1.47	0.99	1.56	1.74	1.58	2.33	5.44	1.57	3.44	6.78	3.48
50th-Percentile Queue Length [ft/ln]	70.51	36.63	24.77	38.89	43.47	39.57	58.21	135.92	39.32	86.11	169.54	87.07
95th-Percentile Queue Length [veh/ln]	5.08	2.64	1.78	2.80	3.13	2.85	4.19	9.26	2.83	6.20	11.05	6.27
95th-Percentile Queue Length [ft/ln]	126.91	65.93	44.58	70.01	78.25	71.22	104.79	231.51	70.78	154.99	276.31	156.72

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	61.76	10.25	10.08	53.83	10.93	6.88	59.06	48.36	43.09	59.95	47.65	43.34
Movement LOS	E	B	B	D	B	A	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	20.50			17.37			50.52			48.72		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	36.01											
Intersection LOS	D											
Intersection V/C	0.380											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.615			2.768			2.798			2.682		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			818			873		
d_b, Bicycle Delay [s]	29.09			26.95			19.20			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.936			2.065			2.070			2.177		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	77	0	135	0	615	360	228	692	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	77	0	135	0	615	360	228	692	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	19	0	34	0	154	90	57	173	0
Total Analysis Volume [veh/h]	0	0	0	77	0	135	0	615	360	228	692	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	53	0	0	19	0	38	57	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		11	11	71	71	16	91
g / C, Green / Cycle		0.10	0.10	0.65	0.65	0.15	0.83
(v / s)_i Volume / Saturation Flow Rate		0.04	0.08	0.16	0.20	0.13	0.18
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		174	174	2462	1166	264	3157
d1, Uniform Delay [s]		46.90	48.53	8.14	8.53	45.84	1.92
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.77	7.31	0.24	0.69	8.22	0.16
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.44	0.78	0.25	0.31	0.86	0.22
d, Delay for Lane Group [s/veh]		48.67	55.84	8.38	9.22	54.06	2.08
Lane Group LOS		D	E	A	A	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.07	3.96	2.97	3.77	6.66	1.03
50th-Percentile Queue Length [ft/ln]		51.86	99.03	74.28	94.13	166.40	25.86
95th-Percentile Queue Length [veh/ln]		3.73	7.13	5.35	6.78	10.89	1.86
95th-Percentile Queue Length [ft/ln]		93.35	178.25	133.71	169.44	272.17	46.56



**Movement, Approach, & Intersection Results**

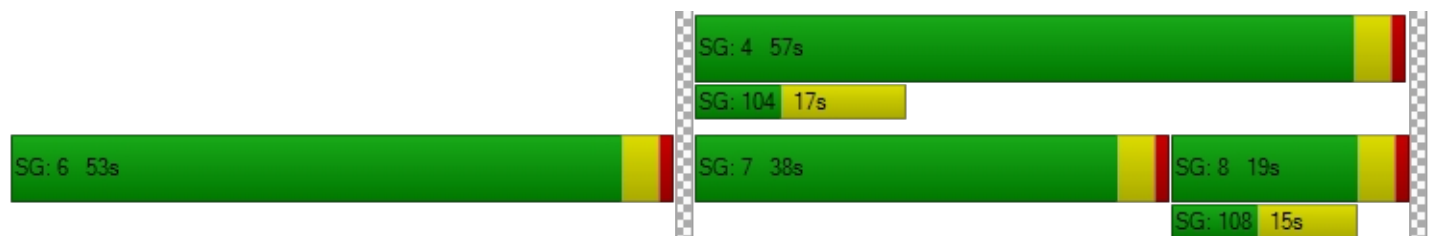
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	48.67	48.67	55.84	0.00	8.38	9.22	54.06	2.08	0.00
Movement LOS				D	D	E		A	A	D	A	
d_A, Approach Delay [s/veh]	0.00			53.24			8.69			14.97		
Approach LOS	A			D			A			B		
d_I, Intersection Delay [s/veh]	15.91											
Intersection LOS	B											
Intersection V/C	0.451											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.006	1.828	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	891	273	964
d_b, Bicycle Delay [s]	55.00	16.91	41.02	14.77
I_b,int, Bicycle LOS Score for Intersection	4.132	1.909	2.096	2.319
Bicycle LOS	D	A	B	B

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	385	0	319	0	0	0	158	538	0	0	525	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	385	0	319	0	0	0	158	538	0	0	525	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	0	80	0	0	0	40	135	0	0	131	29
Total Analysis Volume [veh/h]	385	0	319	0	0	0	158	538	0	0	525	114
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	60	0	0	0	0	0	31	50	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18		12	84	68	68
g / C, Green / Cycle	0.17	0.17	0.17		0.11	0.76	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.12		0.09	0.14	0.17	0.18
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	299	299	299		192	2891	1174	1112
d1, Uniform Delay [s]	44.23	43.97	43.63		48.09	3.66	9.66	9.77
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.48	4.59	3.69		8.45	0.14	0.57	0.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.79	0.75		0.82	0.19	0.27	0.29
d, Delay for Lane Group [s/veh]	49.72	48.56	47.32		56.54	3.80	10.23	10.42
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.86	6.51	6.06		4.68	1.44	3.56	3.62
50th-Percentile Queue Length [ft/ln]	171.53	162.66	151.60		116.97	36.06	89.08	90.40
95th-Percentile Queue Length [veh/ln]	11.16	10.69	10.10		8.23	2.60	6.41	6.51
95th-Percentile Queue Length [ft/ln]	278.93	267.25	252.56		205.65	64.91	160.35	162.73

**Movement, Approach, & Intersection Results**

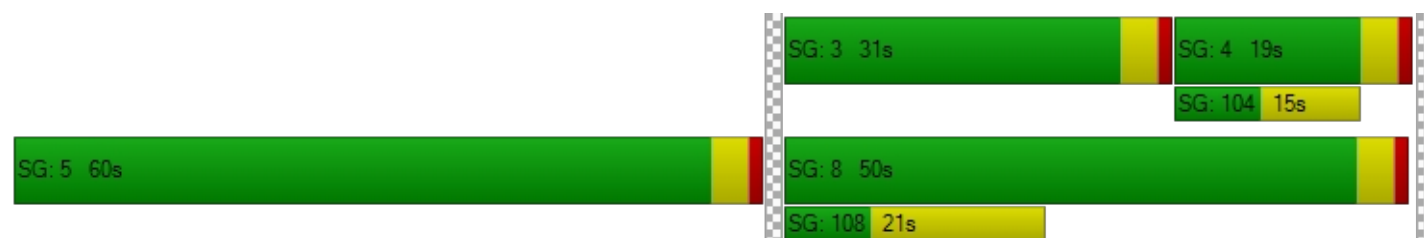
d_M, Delay for Movement [s/veh]	49.28	0.00	47.66	0.00	0.00	0.00	56.54	3.80	0.00	0.00	10.30	10.42
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	48.57			0.00			15.78			10.33		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	25.39											
Intersection LOS	C											
Intersection V/C	0.451											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.179	1.698	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	836	273
d_b, Bicycle Delay [s]	55.00	55.00	18.62	41.02
I_b,int, Bicycle LOS Score for Intersection	5.294	4.132	2.134	2.087
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 15: Lemon Street at Wilshire Avenue

Control Type:	Signalized	Delay (sec / veh):	3.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.139

#### Intersection Setup

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	19	357	12	10	411	6	7	5	16	3	9	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	357	12	10	411	6	7	5	16	3	9	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	89	3	3	103	2	2	1	4	1	2	2
Total Analysis Volume [veh/h]	19	357	12	10	411	6	7	5	16	3	9	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	98	98	98	98	98	98	3	3
g / C, Green / Cycle	0.90	0.90	0.90	0.90	0.90	0.90	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.10	0.01	0.11	0.11	0.02	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1612	1701	1612	1615	1701	1612	98	95
d1, Uniform Delay [s]	0.61	0.67	0.67	0.60	0.68	0.68	52.34	52.10
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.13	0.14	0.01	0.15	0.16	1.58	1.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.01	0.11	0.11	0.01	0.13	0.13	0.29	0.21
d, Delay for Lane Group [s/veh]	0.62	0.80	0.81	0.61	0.83	0.84	53.92	53.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.01	0.13	0.12	0.01	0.14	0.14	0.80	0.57
50th-Percentile Queue Length [ft/ln]	0.29	3.17	3.06	0.15	3.62	3.51	20.06	14.22
95th-Percentile Queue Length [veh/ln]	0.02	0.23	0.22	0.01	0.26	0.25	1.44	1.02
95th-Percentile Queue Length [ft/ln]	0.53	5.70	5.50	0.28	6.52	6.33	36.10	25.59



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.62	0.80	0.81	0.61	0.83	0.84	53.92	53.92	53.92	53.20	53.20	53.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	0.79			0.83			53.92			53.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	3.75											
Intersection LOS	A											
Intersection V/C	0.139											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.473			2.475			1.782			1.762		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.880			1.912			1.606			1.593		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.433

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	70	618	124	66	713	88	87	278	111	175	278	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	618	124	66	713	88	87	278	111	175	278	58
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	155	31	17	178	22	22	70	28	44	70	15
Total Analysis Volume [veh/h]	70	618	124	66	713	88	87	278	111	175	278	58
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	54	0	10	47	0	10	33	0	13	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	37	28	28	37	28	28	65	54	54	65	56	56
g / C, Green / Cycle	0.33	0.25	0.25	0.33	0.25	0.25	0.59	0.49	0.49	0.59	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.07	0.04	0.22	0.21	0.05	0.07	0.06	0.10	0.07	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	320	953	452	441	475	450	1088	1862	882	1085	1918	909
d1, Uniform Delay [s]	25.32	36.87	33.16	25.26	39.71	39.28	9.61	15.45	15.26	10.13	14.56	13.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.34	0.75	0.33	0.16	5.55	4.53	0.03	0.17	0.29	0.32	0.16	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.22	0.65	0.27	0.15	0.88	0.85	0.08	0.15	0.13	0.16	0.14	0.06
d, Delay for Lane Group [s/veh]	25.66	37.62	33.49	25.41	45.26	43.80	9.64	15.62	15.55	10.45	14.72	14.08
Lane Group LOS	C	D	C	C	D	D	A	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	7.48	2.71	1.21	11.51	10.28	0.88	1.95	1.57	1.95	1.88	0.77
50th-Percentile Queue Length [ft/ln]	32.53	187.11	67.66	30.36	287.79	256.92	22.10	48.65	39.30	48.76	46.92	19.18
95th-Percentile Queue Length [veh/ln]	2.34	11.97	4.87	2.19	17.08	15.53	1.59	3.50	2.83	3.51	3.38	1.38
95th-Percentile Queue Length [ft/ln]	58.55	299.28	121.78	54.66	426.89	388.35	39.78	87.56	70.75	87.77	84.46	34.53

**Movement, Approach, & Intersection Results**

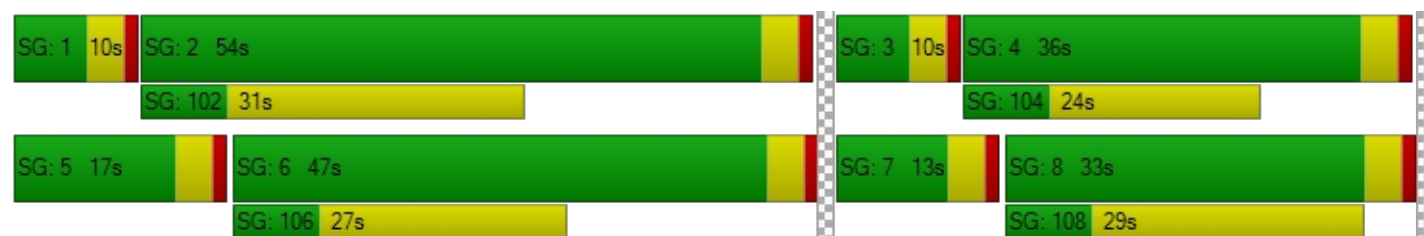
d_M, Delay for Movement [s/veh]	25.66	37.62	33.49	25.41	44.66	43.80	9.64	15.62	15.55	10.45	14.72	14.08
Movement LOS	C	D	C	C	D	D	A	B	B	B	B	B
d_A, Approach Delay [s/veh]	35.96			43.10			14.51			13.18		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	30.09											
Intersection LOS	C											
Intersection V/C	0.433											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.883			2.692			2.637			2.647		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			782			527			582		
d_b, Bicycle Delay [s]	16.36			20.40			29.82			27.65		
I_b,int, Bicycle LOS Score for Intersection	2.230			2.275			1.952			1.981		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.319

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	87	273	128	30	390	51	54	339	87	77	245	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	273	128	30	390	51	54	339	87	77	245	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	68	32	8	98	13	14	85	22	19	61	9
Total Analysis Volume [veh/h]	87	273	128	30	390	51	54	339	87	77	245	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	54	0	16	47	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	18	18	26	16	16	5	67	67	5	67	67
g / C, Green / Cycle	0.24	0.17	0.17	0.24	0.15	0.15	0.04	0.60	0.60	0.05	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.07	0.02	0.12	0.12	0.03	0.09	0.05	0.02	0.06	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	318	635	301	411	278	263	81	2294	1087	176	2314	1096
d1, Uniform Delay [s]	33.67	41.15	41.12	32.58	45.66	45.47	51.76	9.50	9.09	50.77	9.00	8.58
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.46	0.46	0.96	0.07	6.24	5.66	9.03	0.14	0.14	1.71	0.09	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.43	0.43	0.07	0.83	0.80	0.67	0.15	0.08	0.44	0.11	0.03
d, Delay for Lane Group [s/veh]	34.13	41.62	42.08	32.66	51.90	51.13	60.79	9.63	9.23	52.48	9.09	8.64
Lane Group LOS	C	D	D	C	D	D	E	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.91	3.36	3.19	0.63	6.55	5.97	1.67	1.76	0.88	1.07	1.21	0.33
50th-Percentile Queue Length [ft/ln]	47.77	84.05	79.80	15.81	163.86	149.24	41.72	43.89	22.12	26.79	30.33	8.23
95th-Percentile Queue Length [veh/ln]	3.44	6.05	5.75	1.14	10.75	9.98	3.00	3.16	1.59	1.93	2.18	0.59
95th-Percentile Queue Length [ft/ln]	85.99	151.29	143.63	28.47	268.83	249.41	75.10	79.01	39.81	48.23	54.60	14.82



**Movement, Approach, & Intersection Results**

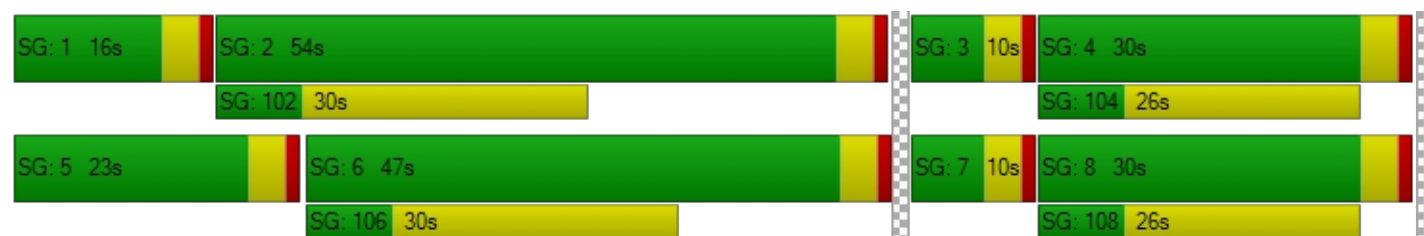
d_M, Delay for Movement [s/veh]	34.13	41.62	42.08	32.66	51.58	51.13	60.79	9.63	9.23	52.48	9.09	8.64
Movement LOS	C	D	D	C	D	D	E	A	A	D	A	A
d_A, Approach Delay [s/veh]	40.40			50.33			15.31			18.44		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	31.94											
Intersection LOS	C											
Intersection V/C	0.319											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.632			2.472			2.623			2.730		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			782			473			473		
d_b, Bicycle Delay [s]	16.36			20.40			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	1.962			1.948			1.956			1.853		
Bicycle LOS	A			A			A			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 18: Harbor Boulevard at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	7.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	31	832	25	24	885	31	22	44	26	51	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	832	25	24	885	31	22	44	26	51	39	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	208	6	6	221	8	6	11	7	13	10	4
Total Analysis Volume [veh/h]	31	832	25	24	885	31	22	44	26	51	39	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	77	0	0	77	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.02	0.23	0.23	0.01	0.25	0.25	0.05	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1486	1637	1551	1493	1637	1551	159	70	118
d1, Uniform Delay [s]	1.07	1.37	1.37	1.07	1.40	1.40	50.52	49.33	49.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.41	0.42	0.02	0.45	0.46	3.30	13.67	2.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.27	0.27	0.02	0.29	0.29	0.58	0.73	0.45
d, Delay for Lane Group [s/veh]	1.10	1.78	1.79	1.09	1.85	1.86	53.82	63.00	52.03
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.05	0.96	0.91	0.04	1.05	0.99	2.63	1.61	1.49
50th-Percentile Queue Length [ft/ln]	1.33	23.98	22.64	1.02	26.23	24.70	65.81	40.27	37.18
95th-Percentile Queue Length [veh/ln]	0.10	1.73	1.63	0.07	1.89	1.78	4.74	2.90	2.68
95th-Percentile Queue Length [ft/ln]	2.39	43.16	40.76	1.84	47.21	44.46	118.45	72.48	66.92

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.10	1.79	1.79	1.09	1.86	1.86	53.82	53.82	53.82	63.00	52.03	52.03
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	1.76			1.84			53.82			57.41		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	7.02											
Intersection LOS	A											
Intersection V/C	0.324											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.743			2.693			1.863			2.048		
Crosswalk LOS	B			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1327			1327			527			527		
d_b, Bicycle Delay [s]	6.22			6.22			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.292			2.335			1.711			1.731		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-




### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	62	511	39	35	462	39	28	27	45	49	20	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	511	39	35	462	39	28	27	45	49	20	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	128	10	9	116	10	7	7	11	12	5	7
Total Analysis Volume [veh/h]	62	511	39	35	462	39	28	27	45	49	20	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	85	0	0	85	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	94	94	94	94	94	94	8	8
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.03	0.15	0.15	0.02	0.14	0.13	0.06	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1515	1626	1541	1510	1626	1541	170	178
d1, Uniform Delay [s]	1.18	1.34	1.34	1.16	1.32	1.32	50.16	50.04
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.24	0.24	0.03	0.21	0.22	3.20	2.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.18	0.17	0.02	0.16	0.16	0.59	0.54
d, Delay for Lane Group [s/veh]	1.23	1.58	1.58	1.19	1.53	1.53	53.36	52.58
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.61	0.57	0.07	0.55	0.51	2.85	2.71
50th-Percentile Queue Length [ft/ln]	2.96	15.36	14.31	1.65	13.77	12.83	71.22	67.72
95th-Percentile Queue Length [veh/ln]	0.21	1.11	1.03	0.12	0.99	0.92	5.13	4.88
95th-Percentile Queue Length [ft/ln]	5.33	27.64	25.76	2.96	24.78	23.09	128.19	121.89



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.23	1.58	1.58	1.19	1.53	1.53	53.36	53.36	53.36	52.58	52.58	52.58
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.54			1.51			53.36			52.58		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	9.03											
Intersection LOS	A											
Intersection V/C	0.222											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.607			2.564			1.920			1.870		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	382			382			1473			1473		
d_b, Bicycle Delay [s]	36.00			36.00			3.82			3.82		
I_b,int, Bicycle LOS Score for Intersection	2.065			2.002			1.725			1.718		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	133	723	125	122	891	127	145	306	137	207	492	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	723	125	122	891	127	145	306	137	207	492	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	181	31	31	223	32	36	77	34	52	123	37
Total Analysis Volume [veh/h]	133	723	125	122	891	127	145	306	137	207	492	146
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	48	0	13	51	0	12	39	0	10	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	28	28	6	28	28	11	45	45	15	49	49
g / C, Green / Cycle	0.05	0.25	0.25	0.05	0.25	0.25	0.10	0.41	0.41	0.13	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.07	0.03	0.22	0.10	0.08	0.05	0.08	0.12	0.09	0.08
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	194	968	459	189	963	456	178	2348	741	241	2548	805
d1, Uniform Delay [s]	51.07	37.76	32.85	51.04	39.28	34.21	48.62	20.12	20.61	46.66	18.43	18.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.27	1.17	0.32	3.65	2.46	0.58	8.72	0.11	0.55	8.64	0.17	0.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.75	0.27	0.64	0.86	0.41	0.82	0.13	0.18	0.86	0.19	0.18
d, Delay for Lane Group [s/veh]	55.33	38.93	33.17	54.68	41.74	34.79	57.35	20.23	21.16	55.30	18.60	18.82
Lane Group LOS	E	D	C	D	D	C	E	C	C	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.91	9.04	2.71	1.74	10.96	4.20	4.32	1.65	2.35	6.10	2.55	2.33
50th-Percentile Queue Length [ft/ln]	47.81	226.08	67.85	43.55	273.90	105.10	108.05	41.24	58.70	152.44	63.80	58.36
95th-Percentile Queue Length [veh/ln]	3.44	13.98	4.89	3.14	16.38	7.57	7.73	2.97	4.23	10.15	4.59	4.20
95th-Percentile Queue Length [ft/ln]	86.06	349.38	122.13	78.39	409.61	189.16	193.28	74.23	105.66	253.69	114.85	105.06

**Movement, Approach, & Intersection Results**

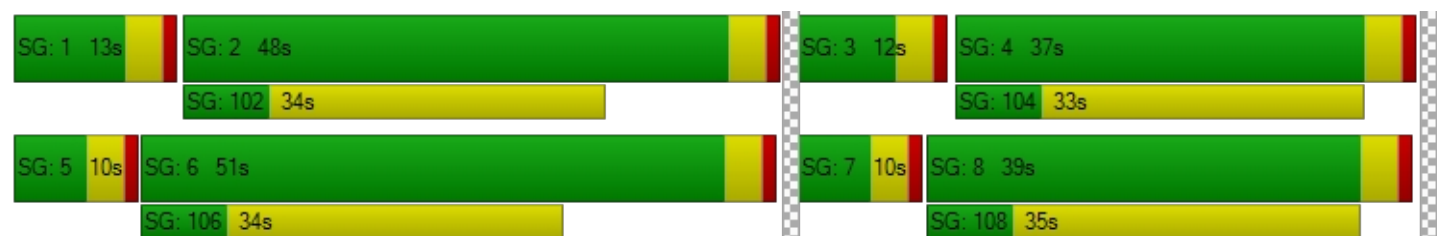
d_M, Delay for Movement [s/veh]	55.33	38.93	33.17	54.68	41.29	34.79	57.35	20.23	21.16	55.30	18.60	18.82
Movement LOS	E	D	C	D	D	C	E	C	C	E	B	B
d_A, Approach Delay [s/veh]	40.42			42.00			29.60			27.63		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	36.09											
Intersection LOS	D											
Intersection V/C	0.524											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.005			2.903			2.898			2.905		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			855			636			600		
d_b, Bicycle Delay [s]	19.80			18.04			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.369			2.187			1.883			2.024		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	193	460	51	89	516	79	93	450	201	78	317	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	193	460	51	89	516	79	93	450	201	78	317	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	115	13	22	129	20	23	113	50	20	79	15
Total Analysis Volume [veh/h]	193	460	51	89	516	79	93	450	201	78	317	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	56	0	10	37	0	10	34	0	10	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	24	24	34	18	18	7	59	59	5	57	57
g / C, Green / Cycle	0.31	0.22	0.22	0.31	0.16	0.16	0.07	0.54	0.54	0.05	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.11	0.12	0.03	0.05	0.14	0.04	0.05	0.12	0.11	0.02	0.10	0.10
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	416	827	392	456	626	296	121	2032	963	176	984	932
d1, Uniform Delay [s]	29.71	38.33	34.67	27.91	44.45	40.18	50.50	13.51	13.41	50.78	14.28	14.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.81	0.59	0.15	0.21	2.82	0.48	9.72	0.25	0.49	1.74	0.46	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.46	0.56	0.13	0.20	0.82	0.27	0.77	0.22	0.21	0.44	0.20	0.19
d, Delay for Lane Group [s/veh]	30.52	38.92	34.82	28.11	47.27	40.65	60.22	13.77	13.90	52.52	14.74	14.67
Lane Group LOS	C	D	C	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.06	5.57	1.12	1.74	7.01	1.91	2.84	2.96	2.69	1.09	2.73	2.48
50th-Percentile Queue Length [ft/ln]	101.50	139.27	28.00	43.61	175.25	47.79	71.04	73.95	67.28	27.15	68.32	61.95
95th-Percentile Queue Length [veh/ln]	7.31	9.44	2.02	3.14	11.35	3.44	5.11	5.32	4.84	1.95	4.92	4.46
95th-Percentile Queue Length [ft/ln]	182.70	236.04	50.40	78.49	283.80	86.02	127.87	133.12	121.11	48.87	122.98	111.51



**Movement, Approach, & Intersection Results**

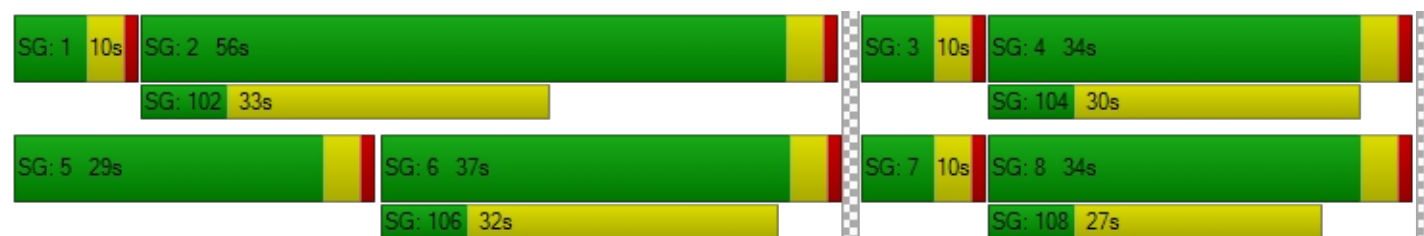
d_M, Delay for Movement [s/veh]	30.52	38.92	34.82	28.11	47.27	40.65	60.22	13.77	13.90	52.52	14.71	14.67
Movement LOS	C	D	C	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	36.32			44.01			19.61			21.19		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	30.89											
Intersection LOS	C											
Intersection V/C	0.444											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.706			2.673			2.729			2.779		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			600			545			545		
d_b, Bicycle Delay [s]	15.29			26.95			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.140			2.124			1.969			1.935		
Bicycle LOS	B			B			A			A		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	15.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	845	0	0	930	466	0	0	0	147	230	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	845	0	0	930	466	0	0	0	147	230	228
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	211	0	0	233	117	0	0	0	37	58	57
Total Analysis Volume [veh/h]	114	845	0	0	930	466	0	0	0	147	230	228
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	38	0	0	28	0	0	0	0	0	62	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	76	67	67		16	16	16
g / C, Green / Cycle	0.06	0.76	0.67	0.67		0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.15	0.24	0.26		0.08	0.06	0.13
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	4349	2525	1196		283	597	283
d1, Uniform Delay [s]	45.82	3.30	7.45	7.59		38.69	37.82	40.69
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.10	0.41	0.96		1.48	0.41	5.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.19	0.37	0.39		0.52	0.39	0.81
d, Delay for Lane Group [s/veh]	48.19	3.40	7.87	8.55		40.17	38.23	46.09
Lane Group LOS	D	A	A	A		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	1.26	4.10	4.35		3.40	2.55	5.79
50th-Percentile Queue Length [ft/ln]	35.98	31.58	102.44	108.85		85.08	63.69	144.63
95th-Percentile Queue Length [veh/ln]	2.59	2.27	7.38	7.78		6.13	4.59	9.73
95th-Percentile Queue Length [ft/ln]	64.76	56.84	184.39	194.41		153.15	114.63	243.24

**Movement, Approach, & Intersection Results**

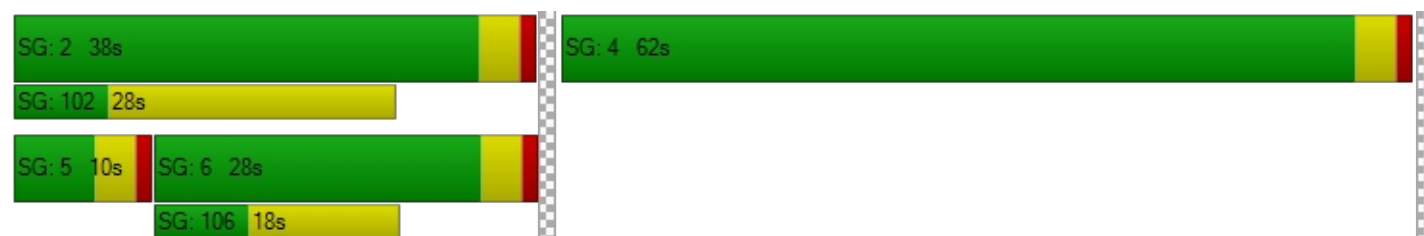
d_M, Delay for Movement [s/veh]	48.19	3.40	0.00	0.00	7.87	8.55	0.00	0.00	0.00	40.17	38.23	46.09
Movement LOS	D	A			A	A				D	D	D
d_A, Approach Delay [s/veh]	8.72			8.09			0.00			41.66		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	15.16											
Intersection LOS	B											
Intersection V/C	0.475											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.115			2.283		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	680			480			0			1160		
d_b, Bicycle Delay [s]	21.78			28.88			50.00			8.82		
I_b,int, Bicycle LOS Score for Intersection	2.087			2.327			4.132			2.059		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 23: Lemon Street at SR-91 WB Ramps

Control Type:	Signalized	Delay (sec / veh):	21.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.512

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	48	352	0	0	719	190	0	0	0	109	359	460
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	352	0	0	719	190	0	0	0	109	359	460
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	88	0	0	180	48	0	0	0	27	90	115
Total Analysis Volume [veh/h]	48	352	0	0	719	190	0	0	0	109	359	460
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	4	63	55	55		29	29	29
g / C, Green / Cycle	0.04	0.63	0.55	0.55		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.16	0.17		0.13	0.12	0.26
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	81	3594	2072	982		521	550	521
d1, Uniform Delay [s]	46.84	7.28	12.30	12.43		29.05	28.75	33.91
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	6.64	0.05	0.36	0.82		0.62	0.51	5.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.10	0.29	0.31		0.45	0.42	0.88
d, Delay for Lane Group [s/veh]	53.48	7.33	12.66	13.25		29.67	29.27	39.03
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.32	0.94	3.61	3.77		4.67	4.53	11.15
50th-Percentile Queue Length [ft/ln]	32.91	23.53	90.29	94.22		116.69	113.28	278.86
95th-Percentile Queue Length [veh/ln]	2.37	1.69	6.50	6.78		8.21	8.02	16.63
95th-Percentile Queue Length [ft/ln]	59.25	42.35	162.53	169.59		205.27	200.56	415.79



**Movement, Approach, & Intersection Results**

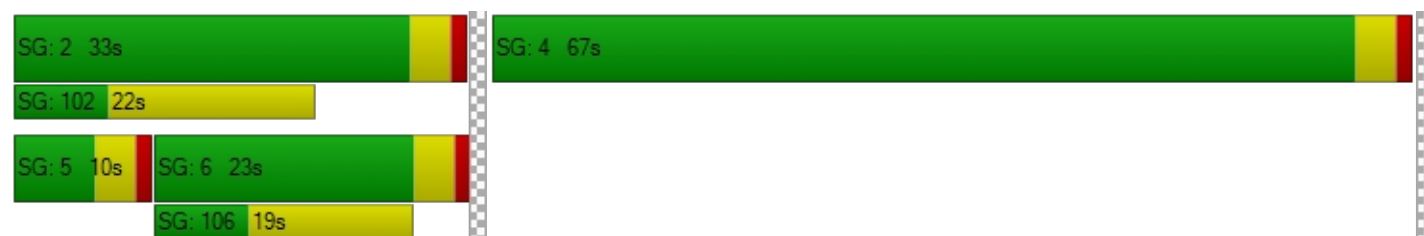
d_M, Delay for Movement [s/veh]	53.48	7.33	0.00	0.00	12.75	13.25	0.00	0.00	0.00	29.67	29.41	39.03
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	12.87			12.85			0.00			34.21		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	21.71											
Intersection LOS	C											
Intersection V/C	0.512											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.011	2.247
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	1.780	2.060	4.132	2.325
Bicycle LOS	A	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.357

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	537	172	312	724	0	453	133	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	537	172	312	724	0	453	133	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	134	43	78	181	0	113	33	37	0	0	0
Total Analysis Volume [veh/h]	0	537	172	312	724	0	453	133	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	25	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	60	60	11	76	16	16	16	
g / C, Green / Cycle	0.60	0.60	0.11	0.76	0.16	0.16	0.16	
(v / s)_i Volume / Saturation Flow Rate	0.09	0.10	0.09	0.13	0.13	0.07	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3430	1083	397	4305	576	313	296	
d1, Uniform Delay [s]	8.76	8.77	43.14	3.43	40.08	37.52	37.97	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.10	0.31	3.45	0.08	2.42	0.92	1.27	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.16	0.16	0.78	0.17	0.79	0.43	0.49	
d, Delay for Lane Group [s/veh]	8.85	9.08	46.59	3.51	42.49	38.43	39.23	
Lane Group LOS	A	A	D	A	D	D	D	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.65	1.65	3.91	1.11	5.48	2.99	3.33	
50th-Percentile Queue Length [ft/ln]	41.14	41.20	97.87	27.87	137.02	74.65	83.33	
95th-Percentile Queue Length [veh/ln]	2.96	2.97	7.05	2.01	9.32	5.37	6.00	
95th-Percentile Queue Length [ft/ln]	74.05	74.17	176.16	50.17	233.00	134.36	149.99	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	8.85	9.08	46.59	3.51	0.00	42.49	38.43	39.23	0.00	0.00	0.00
Movement LOS		A	A	D	A		D	D	D			
d_A, Approach Delay [s/veh]	8.91			16.49			41.10			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	21.59											
Intersection LOS	C											
Intersection V/C	0.357											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.314			2.020		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1000			840			0		
d_b, Bicycle Delay [s]	28.13			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.950			2.129			2.767			4.132		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.433

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	291	185	380	456	0	117	486	38	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	291	185	380	456	0	117	486	38	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	73	46	95	114	0	29	122	10	0	0	0
Total Analysis Volume [veh/h]	0	291	185	380	456	0	117	486	38	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	18	41	0	0	59	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	55	55	13	72	20	20	20	
g / C, Green / Cycle	0.55	0.55	0.13	0.72	0.20	0.20	0.20	
(v / s)_i Volume / Saturation Flow Rate	0.08	0.10	0.11	0.12	0.17	0.16	0.02	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	2101	995	449	2741	358	377	358	
d1, Uniform Delay [s]	10.82	11.13	42.62	4.41	38.66	38.09	32.81	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.14	0.41	4.46	0.13	5.81	3.72	0.13	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.14	0.19	0.85	0.17	0.85	0.79	0.11	
d, Delay for Lane Group [s/veh]	10.96	11.55	47.08	4.54	44.48	41.81	32.93	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.54	2.08	4.83	1.31	7.69	7.24	0.77	
50th-Percentile Queue Length [ft/ln]	38.53	51.96	120.64	32.69	192.35	180.95	19.13	
95th-Percentile Queue Length [veh/ln]	2.77	3.74	8.43	2.35	12.24	11.65	1.38	
95th-Percentile Queue Length [ft/ln]	69.35	93.52	210.71	58.84	306.08	291.25	34.43	



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	10.96	11.55	47.08	4.54	0.00	44.48	42.84	32.93	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	11.19			23.88			42.55			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	26.91											
Intersection LOS	C											
Intersection V/C	0.433											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.153			2.232		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			740			1100			0		
d_b, Bicycle Delay [s]	32.81			19.85			10.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.821			2.249			2.088			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 26: Centennial Way at Berkeley Avenue

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

#### Intersection Setup

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

#### Volumes

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	20	332	3	0	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	20	332	3	0	208
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	83	1	0	52
Total Analysis Volume [veh/h]	0	20	332	3	0	208
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	10.22	0.00	0.00	7.94	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.09	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.17	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.22		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.36					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.230

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	328	12	26	362	0	123	2	191	91	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	328	12	26	362	0	123	2	191	91	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	82	3	7	91	0	31	1	48	23	0	8
Total Analysis Volume [veh/h]	0	328	12	26	362	0	123	2	191	91	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	80	80	88	88	14	14	14	14
g / C, Green / Cycle	0.73	0.73	0.80	0.80	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.09	0.09	0.01	0.10	0.07	0.11	0.05	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1389	1316	1473	3033	267	265	81	232
d1, Uniform Delay [s]	4.37	4.39	2.27	2.47	44.77	46.72	43.67	42.49
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.20	0.00	0.08	1.24	3.81	84.39	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.13	0.02	0.12	0.46	0.73	1.12	0.14
d, Delay for Lane Group [s/veh]	4.55	4.60	2.28	2.56	46.01	50.53	128.06	42.76
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.06	1.07	0.09	0.69	3.22	5.41	3.91	0.82
50th-Percentile Queue Length [ft/ln]	26.57	26.81	2.21	17.25	80.60	135.24	97.76	20.39
95th-Percentile Queue Length [veh/ln]	1.91	1.93	0.16	1.24	5.80	9.22	7.04	1.47
95th-Percentile Queue Length [ft/ln]	47.82	48.26	3.98	31.05	145.09	230.60	175.98	36.69

**Movement, Approach, & Intersection Results**

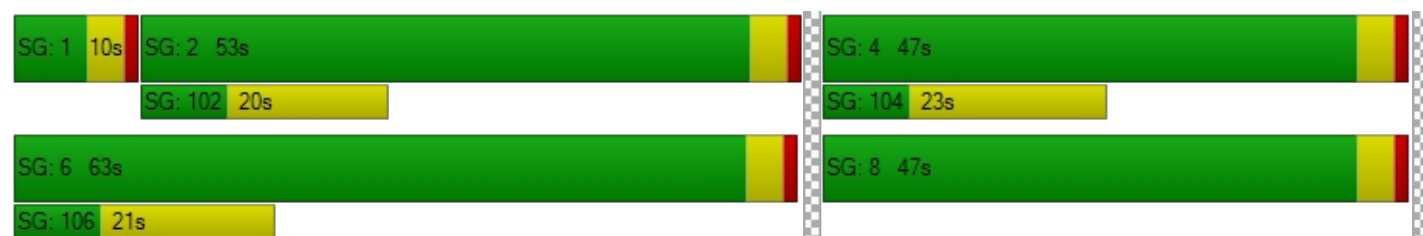
d_M, Delay for Movement [s/veh]	0.00	4.57	4.60	2.28	2.56	0.00	46.01	50.53	50.53	128.06	0.00	42.76
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	4.57			2.54			48.77			105.36		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	26.55											
Intersection LOS	C											
Intersection V/C	0.230											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.654			1.878			2.031		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.840			1.880			2.081			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	0	172	212	0	8	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	172	212	0	8	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	43	53	0	2	0
Total Analysis Volume [veh/h]	0	172	212	0	8	0
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.65	0.00	0.00	0.00	10.01	9.40
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.03	0.03
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.83	0.83
d_A, Approach Delay [s/veh]	0.00		0.00		10.01	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.20					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.029

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	5	167	216	0	0	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	167	216	0	0	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	42	54	0	0	6
Total Analysis Volume [veh/h]	5	167	216	0	0	24
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	7.67	0.00	0.00	0.00	10.13	9.50
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.09	0.09
95th-Percentile Queue Length [ft/ln]	0.28	0.00	0.00	0.00	2.25	2.25
d_A, Approach Delay [s/veh]	0.22		0.00		9.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.65					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	141	11	40	200	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	11	40	200	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	3	10	50	4	7
Total Analysis Volume [veh/h]	141	11	40	200	17	27
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.59	0.00	10.56	9.26
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.09	0.00	0.17	0.17
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.16	0.00	4.36	4.36
d_A, Approach Delay [s/veh]	0.00		1.27		9.76	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.68					
Intersection LOS	B					

### Intersection Level Of Service Report

#### Intersection 31: Lemon Street at Parking Structure

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.212

#### Intersection Setup

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	75	364	0	0	259	21	0	0	125	0	0	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	364	0	0	259	21	0	0	125	0	0	176
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	91	0	0	65	5	0	0	31	0	0	44
Total Analysis Volume [veh/h]	75	364	0	0	259	21	0	0	125	0	0	176
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.21
d_M, Delay for Movement [s/veh]	7.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.75	0.00	0.00	10.51
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.80
95th-Percentile Queue Length [ft/ln]	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.31	0.00	0.00	20.01
d_A, Approach Delay [s/veh]	1.36			0.00			9.75			10.51		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.60											
Intersection LOS	B											

*APPENDIX N-III*





**EXISTING PLUS PROJECT  
FRIDAY ARRIVAL PEAK HOUR**



**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	43.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	161	973	131	303	851	287	155	966	155	130	1011	315
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	161	973	131	303	851	287	155	966	155	130	1011	315
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	243	33	76	213	72	39	242	39	33	253	79
Total Analysis Volume [veh/h]	161	973	131	303	851	287	155	966	155	130	1011	315
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	43	0	11	43	0	14	43	0	13	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	52	52	7	52	52	10	29	29	6	25	25
g / C, Green / Cycle	0.06	0.47	0.47	0.06	0.48	0.48	0.09	0.26	0.26	0.05	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.05	0.17	0.07	0.09	0.21	0.20	0.09	0.20	0.20	0.04	0.18	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	223	2702	853	225	1804	854	165	992	470	193	1281	405
d1, Uniform Delay [s]	50.59	18.37	16.43	51.51	19.11	18.97	49.71	37.48	37.79	51.04	40.22	40.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.12	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.38	0.37	0.38	161.45	0.76	1.52	20.98	1.22	3.20	4.04	1.12	3.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.72	0.36	0.15	1.34	0.43	0.42	0.94	0.76	0.78	0.67	0.79	0.78
d, Delay for Lane Group [s/veh]	54.96	18.74	16.81	212.96	19.87	20.49	70.69	38.70	40.99	55.08	41.34	43.38
Lane Group LOS	D	B	B	F	B	C	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.31	5.25	1.95	8.15	6.64	6.25	5.18	9.41	9.54	1.86	8.66	8.32
50th-Percentile Queue Length [ft/ln]	57.71	131.14	48.79	203.82	165.91	156.26	129.57	235.35	238.59	46.61	216.54	207.92
95th-Percentile Queue Length [veh/ln]	4.15	9.00	3.51	13.94	10.86	10.35	8.92	14.45	14.61	3.36	13.49	13.05
95th-Percentile Queue Length [ft/ln]	103.87	225.04	87.83	348.56	271.53	258.77	222.90	361.15	365.26	83.89	337.21	326.16

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	54.96	18.74	16.81	212.96	19.92	20.49	70.69	39.20	40.99	55.08	41.34	43.38
Movement LOS	D	B	B	F	B	C	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.15			60.62			43.24			43.01		
Approach LOS	C			E			D			D		
d_I, Intersection Delay [s/veh]	43.11											
Intersection LOS	D											
Intersection V/C	0.609											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.119			3.086			2.984			3.168		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			709			709			691		
d_b, Bicycle Delay [s]	22.91			22.91			22.91			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.255			2.352			2.261			2.360		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.570

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	28	1093	641	93	988	28	76	127	29	559	75	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1093	641	93	988	28	76	127	29	559	75	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	273	160	23	247	7	19	32	7	140	19	0
Total Analysis Volume [veh/h]	28	1093	641	93	988	28	76	127	29	559	75	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	55	7	58	58	10	10	10	22	22
g / C, Green / Cycle	0.03	0.50	0.07	0.53	0.53	0.09	0.09	0.09	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.05	0.22	0.11	0.04	0.07	0.02	0.18	0.18
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	58	2826	119	2012	953	160	169	160	368	368
d1, Uniform Delay [s]	52.36	17.32	50.63	15.53	13.70	47.73	48.99	46.47	42.27	42.37
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.00	0.40	10.58	0.61	0.50	2.19	6.65	0.54	5.86	6.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.39	0.78	0.41	0.21	0.48	0.75	0.18	0.86	0.87
d, Delay for Lane Group [s/veh]	58.36	17.72	61.21	16.14	14.20	49.92	55.65	47.01	48.14	48.61
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	5.74	2.87	6.14	2.69	2.08	3.71	0.76	8.80	8.94
50th-Percentile Queue Length [ft/ln]	21.42	143.52	71.69	153.56	67.33	51.99	92.79	19.01	220.03	223.58
95th-Percentile Queue Length [veh/ln]	1.54	9.67	5.16	10.21	4.85	3.74	6.68	1.37	13.67	13.85
95th-Percentile Queue Length [ft/ln]	38.56	241.75	129.04	255.17	121.19	93.59	167.03	34.22	341.66	346.19

**Movement, Approach, & Intersection Results**

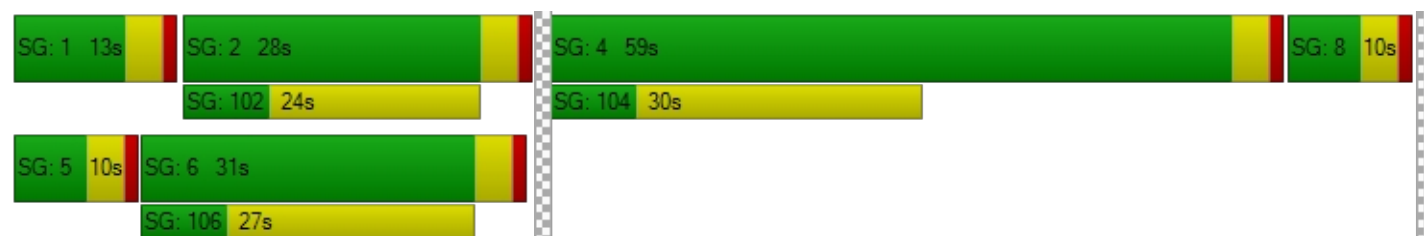
d_M, Delay for Movement [s/veh]	58.36	17.72	0.00	61.21	15.81	14.20	49.92	55.65	47.01	48.34	48.61	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	18.74			19.57			52.69			48.38		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.65											
Intersection LOS	C											
Intersection V/C	0.570											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.921			2.229			2.227		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.176			2.170			1.942			2.606		
Bicycle LOS	B			B			A			B		





**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 24.5  
Level Of Service: C  
Volume to Capacity (v/c): 0.737**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	74	1282	32	356	1109	17	37	112	82	56	134	419
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	1282	32	356	1109	17	37	112	82	56	134	419
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	321	8	89	277	4	9	28	21	14	34	105
Total Analysis Volume [veh/h]	74	1282	32	356	1109	17	37	112	82	56	134	419
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	55	0	18	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	60	60	14	68	68	24	24	24	24	24	42
g / C, Green / Cycle	0.05	0.55	0.55	0.13	0.62	0.62	0.22	0.22	0.22	0.22	0.22	0.38
(v / s)_i Volume / Saturation Flow Rate	0.04	0.36	0.35	0.10	0.29	0.01	0.02	0.06	0.05	0.03	0.07	0.23
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	99	1037	983	450	2354	1115	314	411	390	333	411	686
d1, Uniform Delay [s]	51.20	17.61	17.54	46.48	11.24	8.03	34.46	35.87	35.36	34.84	36.31	27.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.34
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.67	3.20	3.30	3.18	0.68	0.02	0.17	0.35	0.27	0.24	0.46	2.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.65	0.65	0.79	0.47	0.02	0.12	0.27	0.21	0.17	0.33	0.61
d, Delay for Lane Group [s/veh]	61.87	20.80	20.84	49.66	11.92	8.06	34.63	36.22	35.63	35.07	36.77	30.21
Lane Group LOS	E	C	C	D	B	A	C	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.30	12.48	11.73	4.91	7.06	0.16	0.81	2.54	1.84	1.24	3.08	9.28
50th-Percentile Queue Length [ft/ln]	57.50	311.95	293.21	122.65	176.60	3.94	20.22	63.59	45.90	30.94	77.11	231.90
95th-Percentile Queue Length [veh/ln]	4.14	18.27	17.34	8.54	11.42	0.28	1.46	4.58	3.30	2.23	5.55	14.27
95th-Percentile Queue Length [ft/ln]	103.50	456.78	433.62	213.46	285.57	7.10	36.40	114.47	82.61	55.69	138.80	356.77

**Movement, Approach, & Intersection Results**

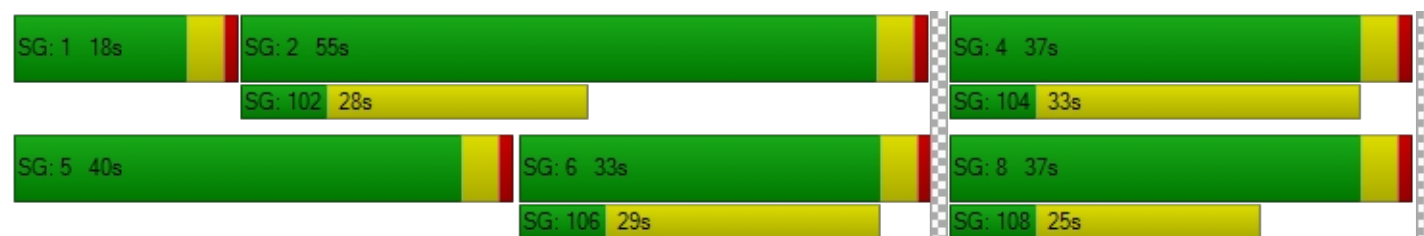
d_M, Delay for Movement [s/veh]	61.87	20.82	20.84	49.66	11.92	8.06	34.63	36.22	35.63	35.07	36.77	30.21
Movement LOS	E	C	C	D	B	A	C	D	D	D	D	C
d_A, Approach Delay [s/veh]	23.01			20.94			35.76			32.10		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	24.47											
Intersection LOS	C											
Intersection V/C	0.737											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.903			3.105			2.252			2.526		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	927			527			600			600		
d_b, Bicycle Delay [s]	15.82			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.705			2.782			1.941			2.564		
Bicycle LOS	B			C			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	50.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	250	274	163	62	247	23	105	302	10	140	317	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	274	163	62	247	23	105	302	10	140	317	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	69	41	16	62	6	26	76	3	35	79	17
Total Analysis Volume [veh/h]	250	274	163	62	247	23	105	302	10	140	317	69
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	30	0	0	49	49	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	39	39	20	20	63	20	20	20
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.18	0.18	0.57	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.09	0.03	0.15	0.06	0.16	0.01	0.08	0.11	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	640	640	640	640	640	198	341	1029	100	341	323
d1, Uniform Delay [s]	26.46	26.87	25.05	23.60	26.80	39.24	43.94	10.13	39.14	41.38	41.13
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.14	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.79	2.09	0.96	0.30	2.03	2.18	9.89	0.02	191.15	1.67	1.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.43	0.25	0.10	0.42	0.53	0.89	0.01	1.40	0.60	0.57
d, Delay for Lane Group [s/veh]	28.25	28.96	26.01	23.90	28.84	41.43	53.83	10.15	230.28	43.05	42.69
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	5.19	5.79	3.18	1.13	5.69	2.59	8.89	0.11	7.68	5.20	4.65
50th-Percentile Queue Length [ft/ln]	129.74	144.85	79.44	28.27	142.29	64.79	222.37	2.69	191.91	130.00	116.28
95th-Percentile Queue Length [veh/ln]	8.93	9.74	5.72	2.04	9.60	4.67	13.79	0.19	13.82	8.94	8.19
95th-Percentile Queue Length [ft/ln]	223.14	243.54	142.99	50.89	240.10	116.63	344.65	4.83	345.44	223.49	204.70

**Movement, Approach, & Intersection Results**

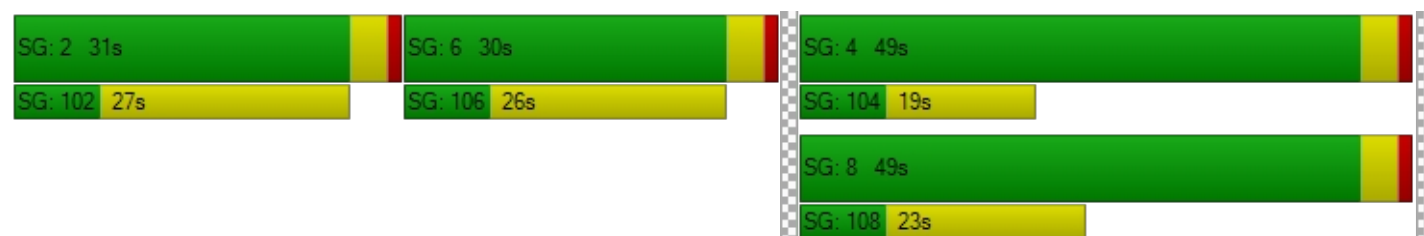
d_M, Delay for Movement [s/veh]	28.25	28.96	26.01	23.90	28.84	28.84	41.43	53.83	10.15	230.28	42.92	42.69
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	28.00			27.92			49.66			92.76		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	49.95											
Intersection LOS	D											
Intersection V/C	0.518											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.604			2.353			2.506			2.397		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			818			818		
d_b, Bicycle Delay [s]	31.31			32.07			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.693			2.107			2.248			1.994		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.329

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	175	136	230	395	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	175	136	230	395	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	44	34	58	99	7
Total Analysis Volume [veh/h]	17	175	136	230	395	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	89	89	89	89
g / C, Green / Cycle	0.12	0.12	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.08	0.12	0.21	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	211	211	1387	1539	1539	1458
d1, Uniform Delay [s]	43.21	47.42	2.14	2.26	2.50	2.01
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.14	0.14	0.21	0.40	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.83	0.10	0.15	0.26	0.02
d, Delay for Lane Group [s/veh]	43.38	55.55	2.29	2.46	2.91	2.04
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.42	5.14	0.48	0.85	1.63	0.10
50th-Percentile Queue Length [ft/ln]	10.56	128.54	12.10	21.30	40.72	2.41
95th-Percentile Queue Length [veh/ln]	0.76	8.86	0.87	1.53	2.93	0.17
95th-Percentile Queue Length [ft/ln]	19.01	221.51	21.78	38.35	73.30	4.33

**Movement, Approach, & Intersection Results**

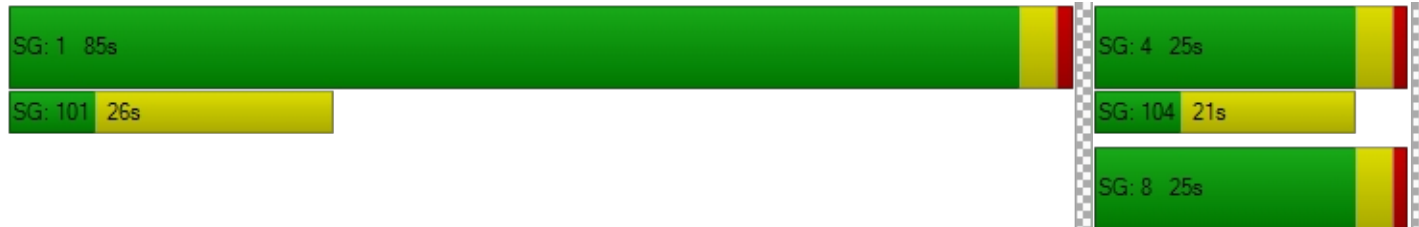
d_M, Delay for Movement [s/veh]	43.38	55.55	2.29	2.46	2.91	2.04
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	54.47		2.40		2.85	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	12.77					
Intersection LOS	B					
Intersection V/C	0.329					

**Other Modes**


g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.259	2.254	2.168
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.736	4.832
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 40.8  
Level Of Service: D  
Volume to Capacity (v/c): 0.839**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	220	1205	169	186	867	23	42	581	167	193	780	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	1205	169	186	867	23	42	581	167	193	780	196
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	301	42	47	217	6	11	145	42	48	195	49
Total Analysis Volume [veh/h]	220	1205	169	186	867	23	42	581	167	193	780	196
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	12	59	0	11	30	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	65	54	54	65	55	55	37	26	26	37	29	29
g / C, Green / Cycle	0.59	0.49	0.49	0.59	0.50	0.50	0.34	0.24	0.24	0.34	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.12	0.38	0.37	0.10	0.24	0.24	0.02	0.21	0.19	0.11	0.27	0.25
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	885	933	884	624	952	902	240	447	423	330	493	467
d1, Uniform Delay [s]	10.42	22.84	22.48	10.20	18.04	17.99	24.90	40.73	39.93	27.24	40.74	40.48
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.28	0.24	0.11	0.45	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	5.97	5.70	0.26	1.75	1.81	0.34	14.53	8.67	1.65	52.95	32.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.25	0.77	0.75	0.30	0.48	0.48	0.17	0.89	0.83	0.59	1.05	0.98
d, Delay for Lane Group [s/veh]	11.09	28.81	28.18	10.47	19.79	19.80	25.24	55.26	48.60	28.89	93.70	73.43
Lane Group LOS	B	C	C	B	B	B	C	E	D	C	F	E
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.57	16.09	14.61	2.04	7.95	7.46	0.77	12.13	9.89	3.92	20.36	16.38
50th-Percentile Queue Length [ft/ln]	64.25	402.21	365.15	50.91	198.82	186.60	19.29	303.29	247.27	97.90	509.11	409.62
95th-Percentile Queue Length [veh/ln]	4.63	22.67	20.87	3.67	12.58	11.94	1.39	17.84	15.05	7.05	28.64	23.02
95th-Percentile Queue Length [ft/ln]	115.65	566.67	521.84	91.63	314.44	298.62	34.73	446.10	376.22	176.22	715.97	575.58

**Movement, Approach, & Intersection Results**

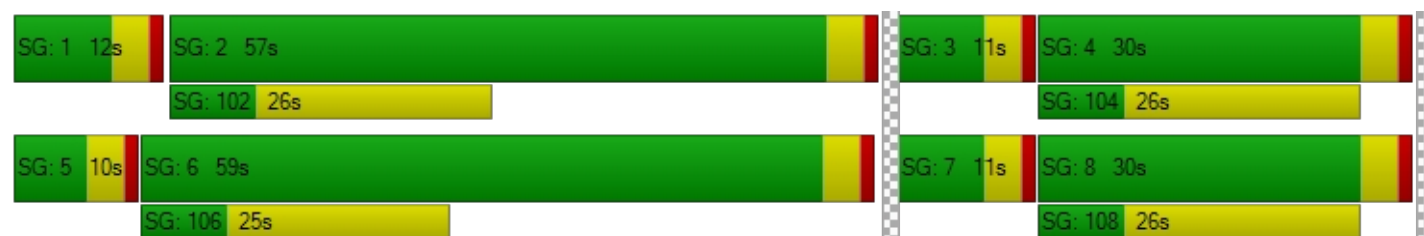
d_M, Delay for Movement [s/veh]	11.09	28.55	28.18	10.47	19.79	19.80	25.24	53.17	48.60	28.89	86.89	73.43
Movement LOS	B	C	C	B	B	B	C	D	D	C	F	E
d_A, Approach Delay [s/veh]	26.10			18.18			50.72			75.06		
Approach LOS	C			B			D			E		
d_I, Intersection Delay [s/veh]	40.83											
Intersection LOS	D											
Intersection V/C	0.839											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.929			2.817			2.825			2.854		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			1000			473			473		
d_b, Bicycle Delay [s]	14.77			13.75			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.875			2.447			2.211			2.524		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	124	981	214	132	886	142	219	773	146	221	898	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	124	981	214	132	886	142	219	773	146	221	898	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	245	54	33	222	36	55	193	37	55	225	45
Total Analysis Volume [veh/h]	124	981	214	132	886	142	219	773	146	221	898	181
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	13	59	0	10	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	59	48	48	59	49	49	44	33	33	44	30	30
g / C, Green / Cycle	0.53	0.44	0.44	0.53	0.44	0.44	0.40	0.30	0.30	0.40	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.07	0.33	0.31	0.07	0.28	0.27	0.12	0.26	0.24	0.12	0.24	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	640	835	791	538	838	793	410	578	548	382	1054	499
d1, Uniform Delay [s]	12.99	25.87	25.18	13.05	24.05	23.61	22.86	35.77	35.11	22.89	37.66	31.97
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	6.28	5.43	0.23	3.82	3.55	1.09	3.33	2.64	1.38	2.07	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.75	0.71	0.25	0.65	0.61	0.53	0.84	0.79	0.58	0.85	0.36
d, Delay for Lane Group [s/veh]	13.66	32.15	30.60	13.28	27.87	27.16	23.95	39.10	37.75	24.28	39.72	32.42
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.64	14.87	12.88	1.66	11.59	10.27	4.01	12.50	10.92	4.08	11.60	3.93
50th-Percentile Queue Length [ft/ln]	41.04	371.82	322.02	41.57	289.87	256.73	100.30	312.54	273.10	101.90	290.03	98.22
95th-Percentile Queue Length [veh/ln]	2.96	21.20	18.77	2.99	17.18	15.52	7.22	18.30	16.34	7.34	17.19	7.07
95th-Percentile Queue Length [ft/ln]	73.88	529.94	469.17	74.83	429.48	388.12	180.54	457.51	408.61	183.42	429.68	176.79

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	13.66	31.60	30.60	13.28	27.59	27.16	23.95	38.60	37.75	24.28	39.72	32.42
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	29.75			25.91			35.67			36.08		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	31.89											
Intersection LOS	C											
Intersection V/C	0.831											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.912			2.897			2.839			2.942		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			945		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.648			2.517			2.498			2.632		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.739

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	114	603	209	69	406	134	304	666	130	182	1022	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	603	209	69	406	134	304	666	130	182	1022	176
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	151	52	17	102	34	76	167	33	46	256	44
Total Analysis Volume [veh/h]	114	603	209	69	406	134	304	666	130	182	1022	176
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	41	58	0	10	27	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	35	35	44	34	34	21	48	48	6	33	33
g / C, Green / Cycle	0.40	0.32	0.32	0.40	0.31	0.31	0.19	0.44	0.44	0.05	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.12	0.04	0.15	0.14	0.17	0.22	0.21	0.05	0.27	0.10
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	592	1198	567	581	587	556	341	827	783	194	1144	542
d1, Uniform Delay [s]	21.13	30.68	29.20	20.58	31.00	30.59	43.51	22.55	22.19	51.82	36.79	29.81
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.72	1.51	1.84	0.09	2.92	2.66	8.02	0.49	0.46	18.55	2.70	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.19	0.50	0.37	0.12	0.49	0.45	0.89	0.51	0.48	0.94	0.89	0.32
d, Delay for Lane Group [s/veh]	21.85	32.19	31.04	20.67	33.92	33.25	51.53	23.03	22.65	70.37	39.48	30.15
Lane Group LOS	C	C	C	C	C	C	D	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.00	6.71	4.55	1.12	6.66	5.76	8.77	7.87	6.93	3.00	13.35	3.66
50th-Percentile Queue Length [ft/ln]	49.94	167.78	113.80	28.05	166.39	143.95	219.27	196.81	173.14	74.89	333.72	91.44
95th-Percentile Queue Length [veh/ln]	3.60	10.96	8.05	2.02	10.89	9.69	13.63	12.47	11.24	5.39	19.34	6.58
95th-Percentile Queue Length [ft/ln]	89.89	274.00	201.27	50.49	272.16	242.34	340.69	311.85	281.04	134.79	483.52	164.60

**Movement, Approach, & Intersection Results**

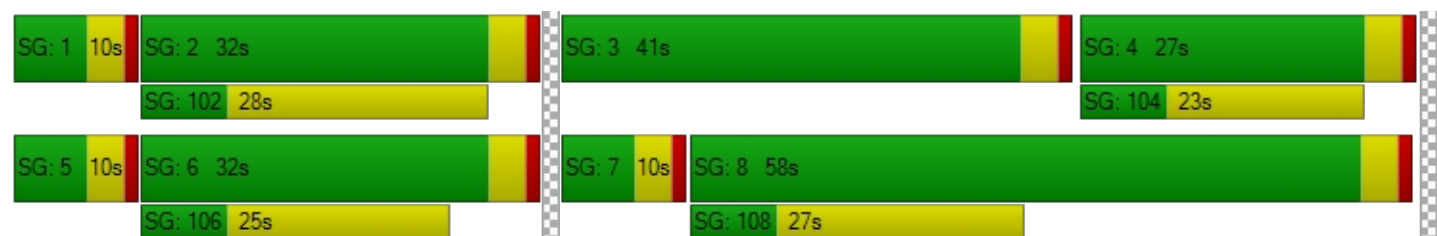
d_M, Delay for Movement [s/veh]	21.85	32.19	31.04	20.67	33.72	33.25	51.53	22.89	22.65	70.37	39.48	30.15
Movement LOS	C	C	C	C	C	C	D	C	C	E	D	C
d_A, Approach Delay [s/veh]	30.66			32.14			30.78			42.37		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	34.94											
Intersection LOS	C											
Intersection V/C	0.739											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.730			2.639			2.825			2.960		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			418		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			34.40		
I_b,int, Bicycle LOS Score for Intersection	2.324			2.062			2.467			2.698		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.223

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	8	18	14	330	12	104	272	640	5	17	1223	785
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	18	14	330	12	104	272	640	5	17	1223	785
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	5	4	83	3	26	68	160	1	4	306	196
Total Analysis Volume [veh/h]	8	18	14	330	12	104	272	640	5	17	1223	785
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	27	35	67	67	67	53	53	83
g / C, Green / Cycle	0.04	0.04	0.04	0.24	0.32	0.61	0.61	0.61	0.48	0.48	0.76
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.09	0.06	0.15	0.17	0.17	0.01	0.32	0.44
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	65	73	69	849	571	744	1159	1098	743	1823	1365
d1, Uniform Delay [s]	51.07	51.33	51.25	34.84	27.39	9.86	10.14	10.14	15.03	21.96	5.68
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.39
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	1.73	1.42	0.29	0.17	0.30	0.62	0.65	0.06	1.99	1.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.25	0.20	0.39	0.20	0.37	0.29	0.29	0.02	0.67	0.57
d, Delay for Lane Group [s/veh]	51.90	53.06	52.66	35.13	27.56	10.16	10.76	10.79	15.09	23.95	7.06
Lane Group LOS	D	D	D	D	C	B	B	B	B	C	A
Critical Lane Group	No	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.23	0.52	0.40	3.73	2.26	2.95	3.82	3.62	0.23	12.22	6.76
50th-Percentile Queue Length [ft/ln]	5.70	12.91	10.03	93.21	56.45	73.81	95.61	90.53	5.87	305.39	169.06
95th-Percentile Queue Length [veh/ln]	0.41	0.93	0.72	6.71	4.06	5.31	6.88	6.52	0.42	17.95	11.03
95th-Percentile Queue Length [ft/ln]	10.26	23.25	18.05	167.77	101.61	132.85	172.10	162.95	10.56	448.69	275.68

**Movement, Approach, & Intersection Results**

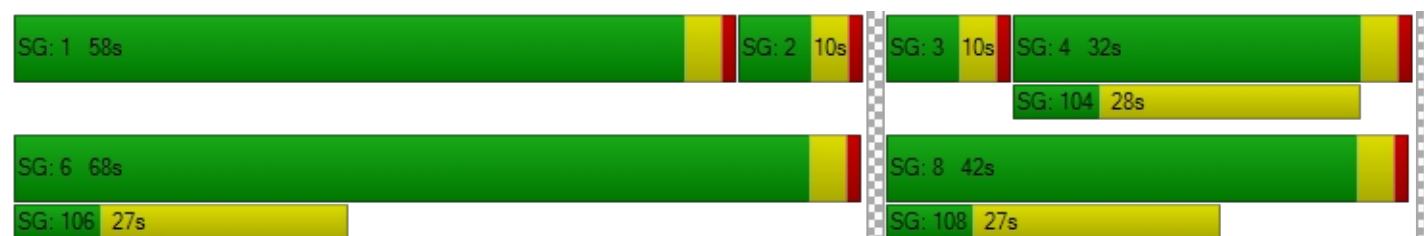
d_M, Delay for Movement [s/veh]	51.90	53.06	52.66	35.13	27.56	27.56	10.16	10.78	10.79	15.09	23.95	7.06
Movement LOS	D	D	D	D	C	C	B	B	B	B	C	A
d_A, Approach Delay [s/veh]	52.69			33.16			10.60			17.32		
Approach LOS	D			C			B			B		
d_I, Intersection Delay [s/veh]	18.00											
Intersection LOS	B											
Intersection V/C	0.223											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.183			2.704			2.760			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			2.296			2.316			3.230		
Bicycle LOS	A			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.790

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	405	181	182	63	114	46	58	811	150	122	1600	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	405	181	182	63	114	46	58	811	150	122	1600	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	45	46	16	29	12	15	203	38	31	400	20
Total Analysis Volume [veh/h]	405	181	182	63	114	46	58	811	150	122	1600	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	31	0	22	35	0	10	47	0	10	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	25	16	16	25	7	7	77	67	67	77	68	68
g / C, Green / Cycle	0.23	0.15	0.15	0.23	0.07	0.07	0.70	0.61	0.61	0.70	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.23	0.10	0.10	0.04	0.04	0.04	0.03	0.27	0.25	0.07	0.46	0.45
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	440	278	263	353	125	119	747	1154	1093	1080	1168	1107
d1, Uniform Delay [s]	42.12	44.37	44.65	33.83	50.25	50.15	5.21	11.59	11.36	5.41	14.98	14.92
k, delay calibration	0.18	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.78	2.58	3.25	0.24	6.05	5.67	0.04	1.22	1.16	0.21	4.24	4.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.92	0.65	0.69	0.18	0.67	0.64	0.08	0.44	0.42	0.11	0.74	0.74
d, Delay for Lane Group [s/veh]	54.90	46.95	47.90	34.07	56.30	55.83	5.25	12.80	12.52	5.62	19.22	19.32
Lane Group LOS	D	D	D	C	E	E	A	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	12.36	4.85	4.94	1.37	2.46	2.23	0.39	6.68	5.88	0.89	15.45	14.57
50th-Percentile Queue Length [ft/ln]	309.11	121.13	123.48	34.33	61.58	55.72	9.74	167.07	146.92	22.37	386.20	364.14
95th-Percentile Queue Length [veh/ln]	18.13	8.45	8.58	2.47	4.43	4.01	0.70	10.92	9.85	1.61	21.89	20.82
95th-Percentile Queue Length [ft/ln]	453.28	211.37	214.60	61.79	110.85	100.30	17.54	273.06	246.31	40.26	547.34	520.62

**Movement, Approach, & Intersection Results**

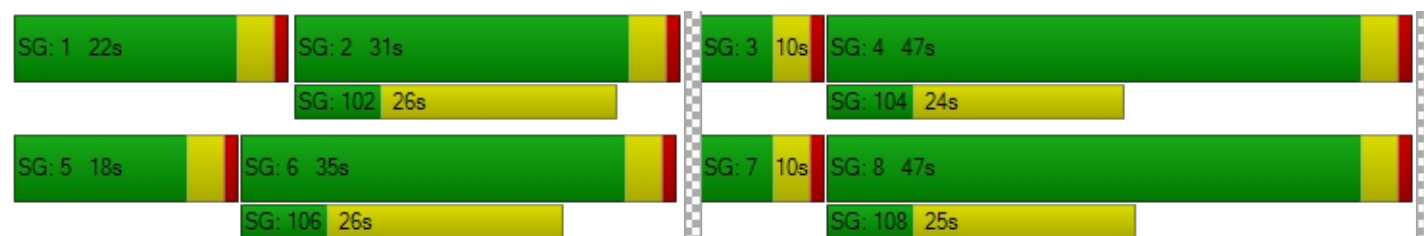
d_M, Delay for Movement [s/veh]	54.90	46.95	47.90	34.07	56.17	55.83	5.25	12.70	12.52	5.62	19.27	19.32
Movement LOS	D	D	D	C	E	E	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	51.37			49.86			12.25			18.34		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	25.21											
Intersection LOS	C											
Intersection V/C	0.790											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.643			2.325			3.064			2.882		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			564			782			782		
d_b, Bicycle Delay [s]	31.31			28.37			20.40			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.827			1.744			2.400			3.047		
Bicycle LOS	C			A			B			C		


**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 13.9  
Level Of Service: B  
Volume to Capacity (v/c): 0.579**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	65	78	34	46	35	30	941	36	73	1665	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	65	78	34	46	35	30	941	36	73	1665	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	16	20	9	12	9	8	235	9	18	416	12
Total Analysis Volume [veh/h]	89	65	78	34	46	35	30	941	36	73	1665	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	67	0	11	68	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	95	85	85	95	87	87
g / C, Green / Cycle	0.06	0.06	0.06	0.06	0.06	0.86	0.78	0.78	0.86	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.05	0.02	0.27	0.26	0.04	0.46	0.46
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	74	125	118	94	118	1318	1475	1398	1498	1506	1426
d1, Uniform Delay [s]	50.09	49.72	50.19	48.94	50.28	1.07	3.74	3.72	1.10	4.42	4.40
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	112.63	3.34	6.15	2.32	6.85	0.01	0.63	0.66	0.06	1.67	1.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.19	0.52	0.66	0.36	0.69	0.02	0.34	0.34	0.05	0.59	0.58
d, Delay for Lane Group [s/veh]	162.72	53.06	56.34	51.26	57.13	1.08	4.37	4.38	1.16	6.09	6.15
Lane Group LOS	F	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.33	1.84	2.30	0.95	2.40	0.04	2.96	2.76	0.13	6.34	6.01
50th-Percentile Queue Length [ft/ln]	108.15	46.11	57.40	23.77	60.08	1.07	73.94	69.11	3.16	158.56	150.24
95th-Percentile Queue Length [veh/ln]	7.79	3.32	4.13	1.71	4.33	0.08	5.32	4.98	0.23	10.47	10.03
95th-Percentile Queue Length [ft/ln]	194.67	83.00	103.32	42.78	108.15	1.93	133.10	124.41	5.68	261.82	250.75

**Movement, Approach, & Intersection Results**

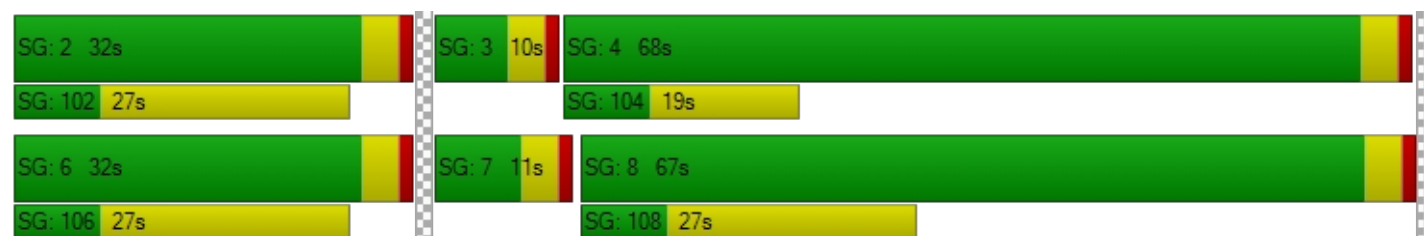
d_M, Delay for Movement [s/veh]	162.72	53.06	56.34	51.26	57.13	57.13	1.08	4.38	4.38	1.16	6.12	6.15
Movement LOS	F	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	96.23			55.39			4.28			5.92		
Approach LOS	F			E			A			A		
d_I, Intersection Delay [s/veh]	13.88											
Intersection LOS	B											
Intersection V/C	0.579											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.318			2.068			2.981			2.911		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			1145			1164		
d_b, Bicycle Delay [s]	30.56			30.56			10.04			9.62		
I_b,int, Bicycle LOS Score for Intersection	1.942			1.749			2.390			3.033		
Bicycle LOS	A			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	50.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.876

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	207	545	101	190	572	391	302	686	101	174	1337	157
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	207	545	101	190	572	391	302	686	101	174	1337	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	136	25	48	143	98	76	172	25	44	334	39
Total Analysis Volume [veh/h]	207	545	101	190	572	391	302	686	101	174	1337	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	34	0	15	37	37	13	47	0	14	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	35	35	8	35	48	9	41	41	10	42	42
g / C, Green / Cycle	0.07	0.32	0.32	0.07	0.32	0.44	0.08	0.37	0.37	0.09	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.12	0.14	0.06	0.05	0.15	0.22	0.09	0.18	0.06	0.10	0.35	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	132	1218	577	255	1218	790	288	1405	666	164	1440	682
d1, Uniform Delay [s]	51.00	29.65	26.91	50.01	29.91	22.13	50.50	26.66	23.15	50.01	32.75	23.25
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.30	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	265.96	1.19	0.66	4.29	1.30	1.34	39.02	0.26	0.10	49.62	3.19	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.57	0.45	0.17	0.74	0.47	0.49	1.05	0.49	0.15	1.06	0.93	0.23
d, Delay for Lane Group [s/veh]	316.96	30.84	27.57	54.30	31.22	23.47	89.52	26.93	23.25	99.63	35.94	23.42
Lane Group LOS	F	C	C	D	C	C	F	C	C	F	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	13.33	5.89	2.02	2.71	6.25	7.43	5.50	6.90	1.77	6.76	17.22	2.80
50th-Percentile Queue Length [ft/ln]	333.27	147.32	50.51	67.73	156.15	185.68	137.53	172.40	44.23	169.03	430.45	69.93
95th-Percentile Queue Length [veh/ln]	21.91	9.87	3.64	4.88	10.34	11.90	9.50	11.20	3.18	11.26	24.02	5.04
95th-Percentile Queue Length [ft/ln]	547.72	246.85	90.91	121.92	258.62	297.41	237.59	280.07	79.61	281.47	600.57	125.88

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	316.96	30.84	27.57	54.30	31.22	23.47	89.52	26.93	23.25	99.63	35.94	23.42
Movement LOS	F	C	C	D	C	C	F	C	C	F	D	C
d_A, Approach Delay [s/veh]	99.88			32.39			43.94			41.40		
Approach LOS	F			C			D			D		
d_I, Intersection Delay [s/veh]	50.28											
Intersection LOS	D											
Intersection V/C	0.876											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.739			2.904			3.025			2.892		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			782			800		
d_b, Bicycle Delay [s]	29.09			26.95			20.40			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.263			2.511			2.458			2.936		
Bicycle LOS	B			B			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	89	0	302	0	800	391	299	1619	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	89	0	302	0	800	391	299	1619	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	22	0	76	0	200	98	75	405	0
Total Analysis Volume [veh/h]	0	0	0	89	0	302	0	800	391	299	1619	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	20	0	0	34	0	56	90	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		16	16	61	61	21	86
g / C, Green / Cycle		0.15	0.15	0.56	0.56	0.19	0.78
(v / s)_i Volume / Saturation Flow Rate		0.05	0.17	0.21	0.22	0.17	0.43
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		262	262	2123	1005	336	2970
d1, Uniform Delay [s]		42.22	46.98	13.54	13.75	43.63	4.57
k, delay calibration		0.11	0.17	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.76	82.58	0.51	1.16	8.08	0.72
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.34	1.15	0.37	0.39	0.89	0.55
d, Delay for Lane Group [s/veh]		42.98	129.56	14.05	14.91	51.71	5.30
Lane Group LOS		D	F	B	B	D	A
Critical Lane Group		No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		2.23	13.15	5.47	5.72	8.63	5.64
50th-Percentile Queue Length [ft/ln]		55.74	328.67	136.71	143.08	215.76	140.97
95th-Percentile Queue Length [veh/ln]		4.01	20.32	9.30	9.65	13.45	9.53
95th-Percentile Queue Length [ft/ln]		100.33	508.04	232.59	241.17	336.20	238.33

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	42.98	42.98	129.56	0.00	14.06	14.91	51.71	5.30	0.00
Movement LOS				D	D	F		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			109.85			14.34			12.53		
Approach LOS	A			F			B			B		
d_I, Intersection Delay [s/veh]	24.02											
Intersection LOS	C											
Intersection V/C	0.667											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			0.00			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.106			1.915			0.000			0.000		
Crosswalk LOS	B			A			F			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	0			291			545			1564		
d_b, Bicycle Delay [s]	55.00			40.16			29.09			2.62		
I_b,int, Bicycle LOS Score for Intersection	4.132			2.205			2.215			3.142		
Bicycle LOS	D			B			B			C		

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	850	0	463	0	0	0	161	735	0	0	1023	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	850	0	463	0	0	0	161	735	0	0	1023	179
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	213	0	116	0	0	0	40	184	0	0	256	45
Total Analysis Volume [veh/h]	850	0	463	0	0	0	161	735	0	0	1023	179
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	59	0	0	0	0	0	32	51	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31		12	71	55	55
g / C, Green / Cycle	0.28	0.28	0.28		0.11	0.64	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.24	0.24	0.24		0.09	0.19	0.32	0.33
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	510	510	510		195	2447	948	898
d1, Uniform Delay [s]	37.32	37.32	37.32		47.99	8.64	20.18	20.71
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.33	4.33	4.33		8.43	0.32	3.22	3.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.86	0.86	0.86		0.82	0.30	0.63	0.67
d, Delay for Lane Group [s/veh]	41.64	41.64	41.64		56.42	8.96	23.40	24.66
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	11.61	11.61	11.61		4.76	3.75	11.77	12.19
50th-Percentile Queue Length [ft/ln]	290.13	290.13	290.13		119.09	93.76	294.17	304.76
95th-Percentile Queue Length [veh/ln]	17.19	17.19	17.19		8.34	6.75	17.39	17.92
95th-Percentile Queue Length [ft/ln]	429.80	429.80	429.80		208.58	168.77	434.81	447.91

**Movement, Approach, & Intersection Results**

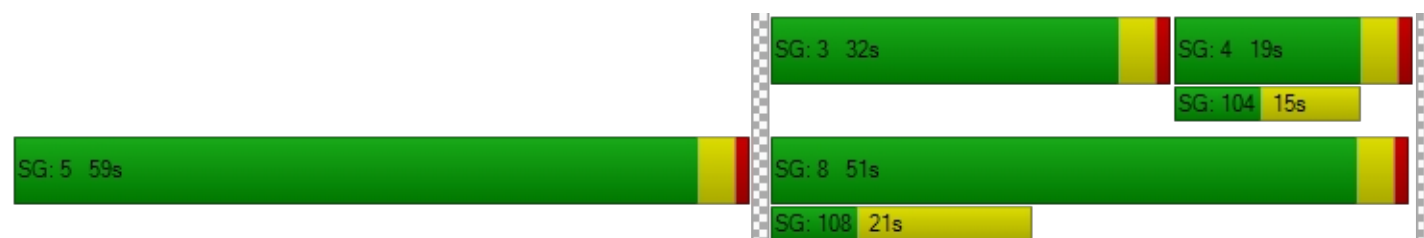
d_M, Delay for Movement [s/veh]	41.64	0.00	41.64	0.00	0.00	0.00	56.42	8.96	0.00	0.00	23.92	24.66
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	41.64			0.00			17.49			24.03		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	29.09											
Intersection LOS	C											
Intersection V/C	0.748											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.376	1.764	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	855	273
d_b, Bicycle Delay [s]	55.00	55.00	18.04	41.02
I_b,int, Bicycle LOS Score for Intersection	6.299	4.132	2.299	2.551
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.320

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	32	943	17	7	661	23	13	26	26	19	18	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	943	17	7	661	23	13	26	26	19	18	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	236	4	2	165	6	3	7	7	5	5	6
Total Analysis Volume [veh/h]	32	943	17	7	661	23	13	26	26	19	18	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.26	0.26	0.00	0.19	0.18	0.04	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1555	1671	1583	1527	1671	1583	125	129
d1, Uniform Delay [s]	0.81	1.08	1.08	0.80	0.98	0.98	51.70	51.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.45	0.47	0.01	0.29	0.30	3.29	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.30	0.29	0.00	0.21	0.21	0.52	0.46
d, Delay for Lane Group [s/veh]	0.84	1.53	1.55	0.81	1.27	1.28	54.99	54.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.04	0.74	0.71	0.01	0.48	0.45	1.88	1.72
50th-Percentile Queue Length [ft/ln]	0.91	18.51	17.65	0.20	11.95	11.34	47.04	42.98
95th-Percentile Queue Length [veh/ln]	0.07	1.33	1.27	0.01	0.86	0.82	3.39	3.09
95th-Percentile Queue Length [ft/ln]	1.64	33.32	31.78	0.35	21.52	20.42	84.68	77.37

**Movement, Approach, & Intersection Results**

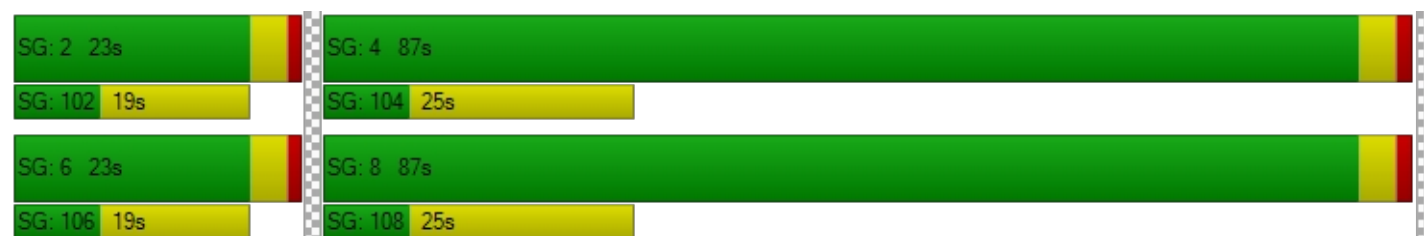
d_M, Delay for Movement [s/veh]	0.84	1.54	1.55	0.81	1.27	1.28	54.99	54.99	54.99	54.14	54.14	54.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.52			1.27			54.99			54.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	A											
Intersection V/C	0.320											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.668			2.654			1.837			1.788		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.378			2.130			1.667			1.659		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.612

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	97	1123	183	87	994	100	147	458	128	201	529	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	1123	183	87	994	100	147	458	128	201	529	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	281	46	22	249	25	37	115	32	50	132	21
Total Analysis Volume [veh/h]	97	1123	183	87	994	100	147	458	128	201	529	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	10	33	0	10	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	47	37	37	47	37	37	55	42	42	55	44	44
g / C, Green / Cycle	0.43	0.34	0.34	0.43	0.34	0.34	0.50	0.38	0.38	0.50	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.05	0.30	0.10	0.05	0.30	0.29	0.08	0.12	0.07	0.11	0.14	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	353	1289	611	365	643	609	817	1440	682	840	1515	718
d1, Uniform Delay [s]	19.10	34.12	26.76	18.98	34.46	34.00	14.97	24.15	22.87	15.48	23.13	20.89
k, delay calibration	0.11	0.11	0.11	0.11	0.19	0.17	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	1.97	0.27	0.33	7.22	5.72	0.10	0.58	0.61	0.67	0.64	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.27	0.87	0.30	0.24	0.89	0.86	0.18	0.32	0.19	0.24	0.35	0.12
d, Delay for Lane Group [s/veh]	19.51	36.10	27.03	19.32	41.68	39.72	15.08	24.73	23.47	16.15	23.76	21.23
Lane Group LOS	B	D	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.54	14.16	3.57	1.37	15.43	13.78	2.01	4.30	2.33	2.96	4.89	1.45
50th-Percentile Queue Length [ft/ln]	38.56	353.98	89.37	34.32	385.84	344.46	50.13	107.54	58.26	73.94	122.17	36.18
95th-Percentile Queue Length [veh/ln]	2.78	20.33	6.43	2.47	21.88	19.87	3.61	7.70	4.19	5.32	8.51	2.60
95th-Percentile Queue Length [ft/ln]	69.41	508.26	160.86	61.77	546.91	496.65	90.23	192.58	104.86	133.09	212.80	65.12

**Movement, Approach, & Intersection Results**

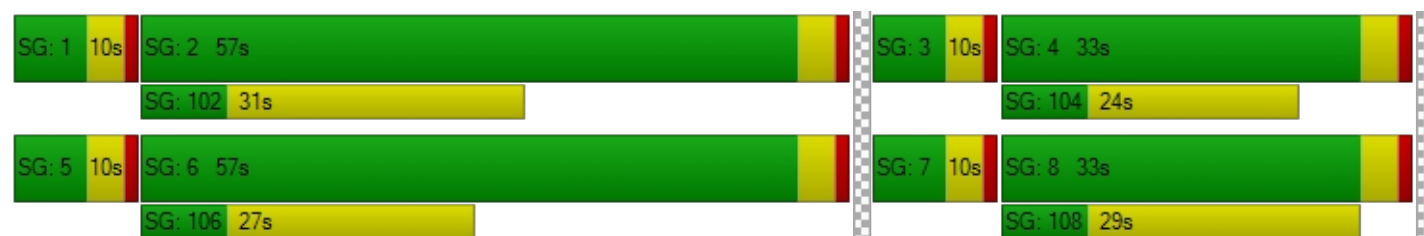
d_M, Delay for Movement [s/veh]	19.51	36.10	27.03	19.32	40.84	39.72	15.08	24.73	23.47	16.15	23.76	21.23
Movement LOS	B	D	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.77			39.16			22.58			21.62		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.93											
Intersection LOS	C											
Intersection V/C	0.612											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.019			2.891			2.749			2.757		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			527		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.717			2.534			2.164			2.232		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	149	842	235	47	623	77	125	506	110	233	659	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	842	235	47	623	77	125	506	110	233	659	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	211	59	12	156	19	31	127	28	58	165	16
Total Analysis Volume [veh/h]	149	842	235	47	623	77	125	506	110	233	659	64
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	25	48	0	22	45	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	37	29	29	37	25	25	10	51	51	10	51	51
g / C, Green / Cycle	0.34	0.26	0.26	0.34	0.22	0.22	0.09	0.46	0.46	0.09	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.08	0.22	0.13	0.03	0.19	0.19	0.07	0.13	0.06	0.07	0.17	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	382	994	471	334	427	404	157	1753	830	313	1760	834
d1, Uniform Delay [s]	26.11	38.57	34.53	24.59	41.00	40.64	49.27	18.43	17.02	48.91	19.19	16.44
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	2.11	0.82	0.19	5.09	4.33	8.75	0.42	0.33	3.53	0.61	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.85	0.50	0.14	0.86	0.83	0.79	0.29	0.13	0.75	0.37	0.08
d, Delay for Lane Group [s/veh]	26.76	40.68	35.35	24.79	46.09	44.97	58.02	18.85	17.35	52.43	19.80	16.62
Lane Group LOS	C	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.88	10.95	5.43	0.85	10.05	9.03	3.74	4.06	1.66	3.27	5.53	0.94
50th-Percentile Queue Length [ft/ln]	71.99	273.63	135.80	21.32	251.29	225.73	93.59	101.43	41.61	81.72	138.20	23.42
95th-Percentile Queue Length [veh/ln]	5.18	16.37	9.25	1.53	15.25	13.96	6.74	7.30	3.00	5.88	9.38	1.69
95th-Percentile Queue Length [ft/ln]	129.58	409.27	231.35	38.37	381.27	348.93	168.47	182.58	74.89	147.10	234.59	42.16

**Movement, Approach, & Intersection Results**

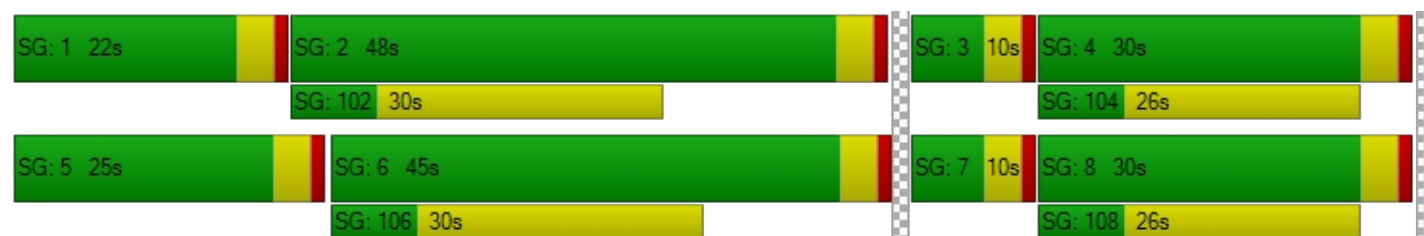
d_M, Delay for Movement [s/veh]	26.76	40.68	35.35	24.79	45.63	44.97	58.02	18.85	17.35	52.43	19.80	16.62
Movement LOS	C	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	37.97			44.25			25.23			27.54		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.96											
Intersection LOS	C											
Intersection V/C	0.583											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.819			2.656			2.778			2.865		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			745			473			473		
d_b, Bicycle Delay [s]	19.80			21.64			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.571			2.176			2.171			2.348		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.550

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	65	1438	48	42	1225	42	47	72	73	77	128	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	1438	48	42	1225	42	47	72	73	77	128	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	360	12	11	306	11	12	18	18	19	32	7
Total Analysis Volume [veh/h]	65	1438	48	42	1225	42	47	72	73	77	128	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.40	0.40	0.02	0.34	0.34	0.11	0.04	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1279	1524	1444	1225	1524	1444	266	73	225
d1, Uniform Delay [s]	2.23	3.60	3.58	2.20	3.28	3.26	47.07	43.83	45.98
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	1.19	1.23	0.05	0.88	0.92	3.70	63.05	3.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.50	0.50	0.03	0.43	0.42	0.72	1.05	0.68
d, Delay for Lane Group [s/veh]	2.30	4.79	4.82	2.25	4.16	4.18	50.77	106.88	49.64
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.24	4.56	4.29	0.15	3.53	3.31	5.39	3.10	4.24
50th-Percentile Queue Length [ft/ln]	6.00	113.93	107.20	3.84	88.15	82.63	134.85	77.53	106.03
95th-Percentile Queue Length [veh/ln]	0.43	8.06	7.68	0.28	6.35	5.95	9.20	5.58	7.62
95th-Percentile Queue Length [ft/ln]	10.79	201.46	192.09	6.91	158.66	148.74	230.07	139.55	190.46

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	2.30	4.80	4.82	2.25	4.17	4.18	50.77	50.77	50.77	106.88	49.64	49.64
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.70			4.11			50.77			68.72		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.66											
Intersection LOS	B											
Intersection V/C	0.550											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.990			2.926			2.025			2.137		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1291			1291			564			564		
d_b, Bicycle Delay [s]	6.91			6.91			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.839			2.640			1.876			1.941		
Bicycle LOS	C			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**Control Type: Signalized  
Analysis Method: HCM 6th Edition  
Analysis Period: 15 minutesDelay (sec / veh): 12.4  
Level Of Service: B  
Volume to Capacity (v/c): 0.504**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	122	1096	76	58	848	74	80	44	141	99	43	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	122	1096	76	58	848	74	80	44	141	99	43	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	274	19	15	212	19	20	11	35	25	11	18
Total Analysis Volume [veh/h]	122	1096	76	58	848	74	80	44	141	99	43	73
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	45	0	0	45	0	0	65	0	0	65	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	84	84	84	84	84	84	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.07	0.32	0.31	0.03	0.25	0.25	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1240	1446	1370	1182	1446	1370	341	347
d1, Uniform Delay [s]	3.36	4.60	4.56	3.23	4.19	4.15	44.73	43.32
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.90	0.92	0.08	0.62	0.62	3.81	1.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.42	0.41	0.05	0.33	0.32	0.78	0.62
d, Delay for Lane Group [s/veh]	3.52	5.50	5.47	3.31	4.80	4.77	48.54	45.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.63	4.31	3.98	0.29	3.09	2.83	7.37	5.68
50th-Percentile Queue Length [ft/ln]	15.83	107.83	99.48	7.27	77.20	70.64	184.16	141.98
95th-Percentile Queue Length [veh/ln]	1.14	7.72	7.16	0.52	5.56	5.09	11.82	9.59
95th-Percentile Queue Length [ft/ln]	28.49	192.98	179.07	13.08	138.96	127.16	295.44	239.68

**Movement, Approach, & Intersection Results**

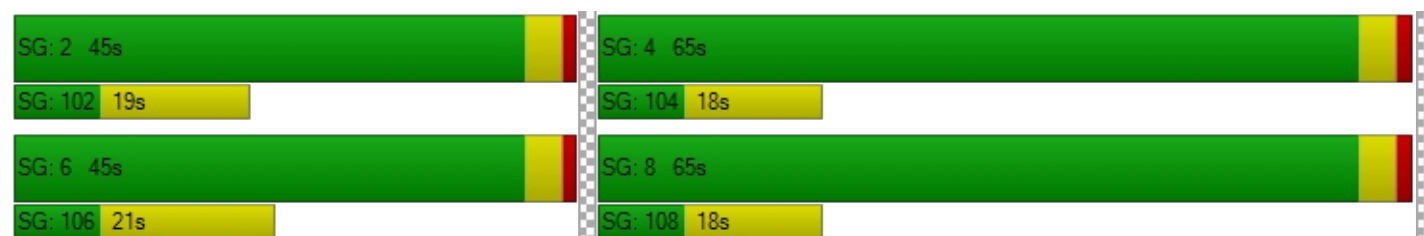
d_M, Delay for Movement [s/veh]	3.52	5.49	5.47	3.31	4.79	4.77	48.54	48.54	48.54	45.14	45.14	45.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.30			4.70			48.54			45.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.36											
Intersection LOS	B											
Intersection V/C	0.504											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.915			2.858			2.144			1.999		
Crosswalk LOS	C			C			B			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			745			1109			1109		
d_b, Bicycle Delay [s]	21.64			21.64			10.91			10.91		
I_b,int, Bicycle LOS Score for Intersection	2.627			2.368			1.997			1.914		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	50.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.836

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	259	1356	285	193	1097	208	250	754	216	225	931	221
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	259	1356	285	193	1097	208	250	754	216	225	931	221
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	339	71	48	274	52	63	189	54	56	233	55
Total Analysis Volume [veh/h]	259	1356	285	193	1097	208	250	754	216	225	931	221
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	40	0	12	41	0	21	39	0	19	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	36	36	8	37	37	17	35	35	15	33	33
g / C, Green / Cycle	0.06	0.33	0.33	0.07	0.34	0.34	0.15	0.32	0.32	0.14	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.36	0.16	0.06	0.28	0.13	0.14	0.13	0.12	0.13	0.16	0.12
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	223	1244	589	253	1276	605	278	1806	570	249	1712	541
d1, Uniform Delay [s]	51.50	36.99	29.56	50.11	33.82	27.82	45.65	29.58	29.16	46.70	32.18	30.69
k, delay calibration	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	83.97	44.34	0.62	4.77	1.58	0.40	10.11	0.71	1.91	11.74	1.25	2.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.16	1.09	0.48	0.76	0.84	0.38	0.90	0.42	0.38	0.91	0.54	0.41
d, Delay for Lane Group [s/veh]	135.47	81.33	30.18	54.88	35.40	28.22	55.76	30.29	31.07	58.44	33.42	32.97
Lane Group LOS	F	F	C	D	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.66	23.99	6.08	2.77	13.31	4.67	7.44	5.33	4.71	6.85	7.06	5.00
50th-Percentile Queue Length [ft/ln]	141.48	599.86	152.03	69.21	332.84	116.73	186.11	133.14	117.87	171.15	176.47	125.07
95th-Percentile Queue Length [veh/ln]	9.99	33.88	10.13	4.98	19.30	8.21	11.92	9.11	8.28	11.14	11.42	8.67
95th-Percentile Queue Length [ft/ln]	249.70	846.88	253.14	124.57	482.44	205.32	297.98	227.75	206.89	278.43	285.40	216.78

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	135.47	81.33	30.18	54.88	35.25	28.22	55.76	30.29	31.07	58.44	33.42	32.97
Movement LOS	F	F	C	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	81.04			36.81			35.65			37.44		
Approach LOS	F			D			D			D		
d_I, Intersection Delay [s/veh]	50.73											
Intersection LOS	D											
Intersection V/C	0.836											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.154			3.067			3.054			3.053		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	655			673			636			600		
d_b, Bicycle Delay [s]	24.89			24.22			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.127			2.384			2.231			2.317		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.879

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	285	1131	134	197	888	167	206	742	184	218	825	145
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	285	1131	134	197	888	167	206	742	184	218	825	145
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	283	34	49	222	42	52	186	46	55	206	36
Total Analysis Volume [veh/h]	285	1131	134	197	888	167	206	742	184	218	825	145
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	46	0	19	45	0	10	32	0	13	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	51	37	37	51	34	34	14	38	38	9	33	33
g / C, Green / Cycle	0.46	0.34	0.34	0.46	0.31	0.31	0.13	0.34	0.34	0.08	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.16	0.30	0.07	0.11	0.23	0.09	0.11	0.20	0.10	0.06	0.27	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	547	1295	613	425	1161	550	236	1307	619	292	562	533
d1, Uniform Delay [s]	18.81	34.07	25.85	17.78	34.64	29.26	46.91	29.44	26.39	49.34	37.31	36.63
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	2.01	0.18	0.79	1.08	0.31	9.59	1.79	1.22	3.83	20.96	16.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.52	0.87	0.22	0.46	0.76	0.30	0.87	0.57	0.30	0.75	0.91	0.86
d, Delay for Lane Group [s/veh]	19.58	36.08	26.03	18.57	35.72	29.57	56.50	31.23	27.61	53.16	58.27	53.30
Lane Group LOS	B	D	C	B	D	C	E	C	C	D	E	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.70	14.27	2.53	3.08	10.80	3.42	6.14	8.23	3.73	3.08	16.28	13.95
50th-Percentile Queue Length [ft/ln]	117.41	356.68	63.27	77.11	270.09	85.61	153.42	205.77	93.13	76.95	406.90	348.79
95th-Percentile Queue Length [veh/ln]	8.25	20.46	4.56	5.55	16.19	6.16	10.20	12.94	6.71	5.54	22.89	20.08
95th-Percentile Queue Length [ft/ln]	206.26	511.54	113.89	138.81	404.86	154.09	254.99	323.40	167.63	138.52	572.31	501.94

**Movement, Approach, & Intersection Results**

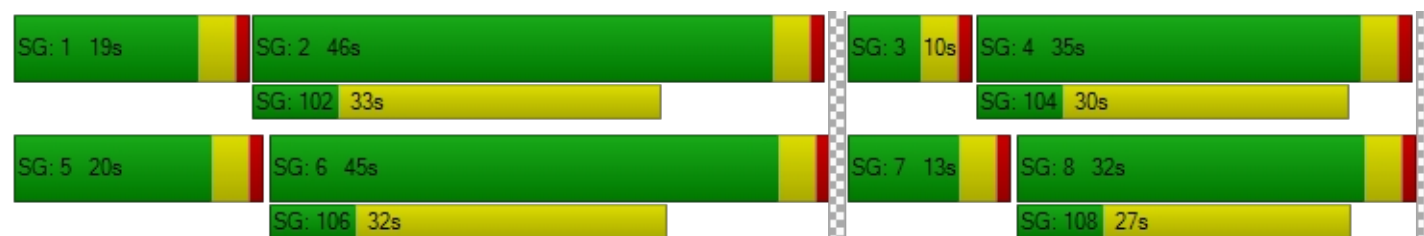
d_M, Delay for Movement [s/veh]	19.58	36.08	26.03	18.57	35.72	29.57	56.50	31.23	27.61	53.16	56.38	53.30
Movement LOS	B	D	C	B	D	C	E	C	C	D	E	D
d_A, Approach Delay [s/veh]	32.17			32.20			35.24			55.41		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.25											
Intersection LOS	D											
Intersection V/C	0.879											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.924			2.907			2.985			3.019		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			745			509			564		
d_b, Bicycle Delay [s]	21.02			21.64			30.56			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.838			2.593			2.182			2.540		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	144	1851	0	0	1486	618	0	0	0	228	347	303
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	1851	0	0	1486	618	0	0	0	228	347	303
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	463	0	0	372	155	0	0	0	57	87	76
Total Analysis Volume [veh/h]	144	1851	0	0	1486	618	0	0	0	228	347	303
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	72	62	62		20	20	20
g / C, Green / Cycle	0.06	0.72	0.62	0.62		0.20	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.32	0.37	0.39		0.13	0.09	0.17
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	210	4084	2343	1110		366	773	366
d1, Uniform Delay [s]	46.07	5.95	11.66	12.05		36.33	34.91	38.15
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	3.92	0.36	1.14	2.74		1.73	0.41	4.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.45	0.60	0.63		0.62	0.45	0.83
d, Delay for Lane Group [s/veh]	49.99	6.32	12.80	14.79		38.06	35.32	42.94
Lane Group LOS	D	A	B	B		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.86	4.70	8.99	9.76		5.20	3.72	7.50
50th-Percentile Queue Length [ft/ln]	46.48	117.43	224.87	243.97		130.00	92.95	187.45
95th-Percentile Queue Length [veh/ln]	3.35	8.25	13.91	14.88		8.94	6.69	11.99
95th-Percentile Queue Length [ft/ln]	83.67	206.29	347.84	372.05		223.50	167.31	299.72

**Movement, Approach, & Intersection Results**

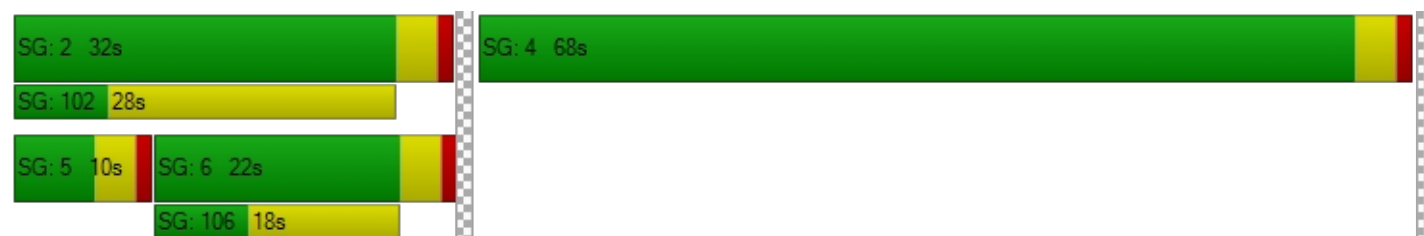
d_M, Delay for Movement [s/veh]	49.99	6.32	0.00	0.00	12.91	14.79	0.00	0.00	0.00	38.06	35.32	42.94
Movement LOS	D	A			B	B				D	D	D
d_A, Approach Delay [s/veh]	9.47			13.46			0.00			38.66		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	16.31											
Intersection LOS	B											
Intersection V/C	0.681											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.260			2.350		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.657			2.717			4.132			2.284		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.808

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	73	1122	0	0	1065	299	0	0	0	157	473	752
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	1122	0	0	1065	299	0	0	0	157	473	752
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	281	0	0	266	75	0	0	0	39	118	188
Total Analysis Volume [veh/h]	73	1122	0	0	1065	299	0	0	0	157	473	752
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	47	37	37		45	45	45
g / C, Green / Cycle	0.05	0.47	0.37	0.37		0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.04	0.20	0.24	0.25		0.18	0.16	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	96	2653	1415	670		818	864	818
d1, Uniform Delay [s]	46.73	17.79	25.89	26.35		18.07	17.80	25.55
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.22
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.86	0.50	2.25	5.45		0.30	0.25	8.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.42	0.64	0.68		0.39	0.36	0.92
d, Delay for Lane Group [s/veh]	58.59	18.28	28.14	31.81		18.38	18.05	34.41
Lane Group LOS	E	B	C	C		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.10	5.69	9.13	9.86		4.81	4.64	17.86
50th-Percentile Queue Length [ft/ln]	52.44	142.33	228.29	246.47		120.25	115.94	446.43
95th-Percentile Queue Length [veh/ln]	3.78	9.61	14.09	15.01		8.41	8.17	24.79
95th-Percentile Queue Length [ft/ln]	94.40	240.16	352.19	375.21		210.18	204.24	619.69

**Movement, Approach, & Intersection Results**

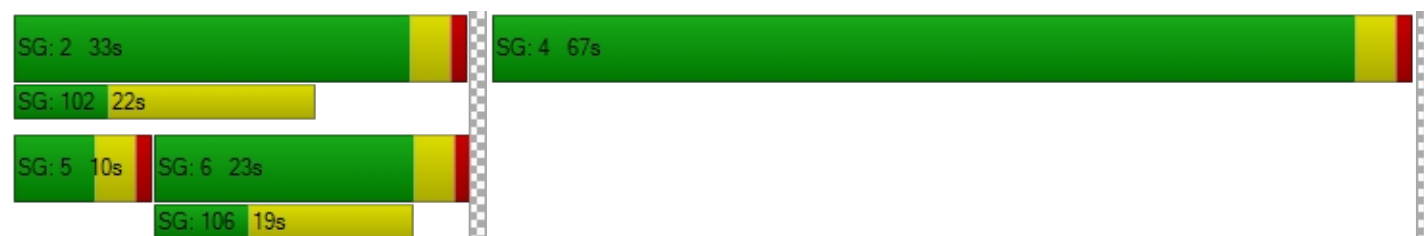
d_M, Delay for Movement [s/veh]	58.59	18.28	0.00	0.00	28.68	31.81	0.00	0.00	0.00	18.38	18.16	34.41
Movement LOS	E	B			C	C				B	B	C
d_A, Approach Delay [s/veh]	20.75			29.37			0.00			27.03		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	25.93											
Intersection LOS	C											
Intersection V/C	0.808											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.132			2.394		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	2.217			2.310			4.132			2.700		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1049	227	326	1223	0	822	322	181	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1049	227	326	1223	0	822	322	181	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	262	57	82	306	0	206	81	45	0	0	0
Total Analysis Volume [veh/h]	0	1049	227	326	1223	0	822	322	181	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	27	56	0	0	44	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	12	64	28	28	28	
g / C, Green / Cycle	0.48	0.48	0.12	0.64	0.28	0.28	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.13	0.09	0.21	0.23	0.17	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2755	870	414	3656	975	529	501	
d1, Uniform Delay [s]	16.36	15.28	42.88	8.18	34.02	31.34	28.94	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.40	0.73	3.38	0.25	2.08	1.13	0.44	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.38	0.26	0.79	0.33	0.84	0.61	0.36	
d, Delay for Lane Group [s/veh]	16.76	16.01	46.25	8.43	36.10	32.47	29.37	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.02	3.15	4.08	3.76	9.50	6.82	3.51	
50th-Percentile Queue Length [ft/ln]	125.38	78.85	101.99	93.90	237.45	170.47	87.84	
95th-Percentile Queue Length [veh/ln]	8.69	5.68	7.34	6.76	14.55	11.10	6.32	
95th-Percentile Queue Length [ft/ln]	217.20	141.94	183.58	169.02	363.81	277.53	158.11	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	16.76	16.01	46.25	8.43	0.00	36.10	32.47	29.37	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	16.63			16.39			34.30			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	22.18											
Intersection LOS	C											
Intersection V/C	0.582											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.459			2.146		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1040			800			0		
d_b, Bicycle Delay [s]	28.13			11.52			18.00			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.261			2.412			3.746			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	842	219	469	725	0	315	534	49	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	842	219	469	725	0	315	534	49	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	211	55	117	181	0	79	134	12	0	0	0
Total Analysis Volume [veh/h]	0	842	219	469	725	0	315	534	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	25	48	0	0	52	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	45	45	16	65	27	27	27	
g / C, Green / Cycle	0.45	0.45	0.16	0.65	0.27	0.27	0.27	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.20	0.13	0.19	0.24	0.22	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1722	816	554	2475	483	510	483	
d1, Uniform Delay [s]	18.38	18.61	40.91	7.51	35.03	34.43	27.50	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.73	1.68	3.68	0.30	5.36	3.56	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.41	0.43	0.85	0.29	0.88	0.83	0.10	
d, Delay for Lane Group [s/veh]	19.10	20.29	44.58	7.81	40.39	37.98	27.59	
Lane Group LOS	B	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.52	5.80	5.83	3.15	10.43	10.01	0.89	
50th-Percentile Queue Length [ft/ln]	138.01	144.89	145.85	78.73	260.76	250.23	22.26	
95th-Percentile Queue Length [veh/ln]	9.37	9.74	9.80	5.67	15.73	15.20	1.60	
95th-Percentile Queue Length [ft/ln]	234.34	243.60	244.88	141.71	393.18	379.94	40.07	

**Movement, Approach, & Intersection Results**

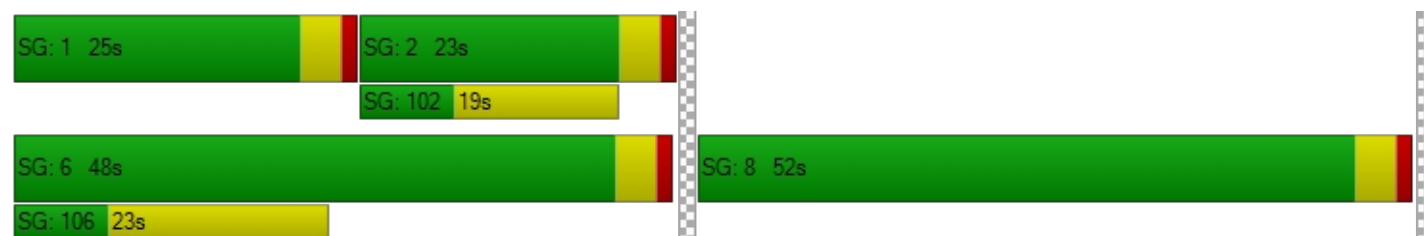
d_M, Delay for Movement [s/veh]	0.00	19.29	20.29	44.58	7.81	0.00	40.39	38.48	27.59	0.00	0.00	0.00
Movement LOS		B	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	19.50			22.25			38.56			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	25.97											
Intersection LOS	C											
Intersection V/C	0.644											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.237			2.315		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			880			960			0		
d_b, Bicycle Delay [s]	32.81			15.68			13.52			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.143			2.545			2.300			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.092

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	67	310	196	6	550
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	67	310	196	6	550
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	17	78	49	2	138
Total Analysis Volume [veh/h]	0	67	310	196	6	550
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	0.00	10.43	0.00	0.00	8.42	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.30	0.00	0.00	0.02	0.00
95th-Percentile Queue Length [ft/ln]	0.00	7.55	0.00	0.00	0.43	0.00
d_A, Approach Delay [s/veh]	10.43		0.00		0.09	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.66					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	24.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.428

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	987	46	88	470	0	91	37	112	112	0	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	987	46	88	470	0	91	37	112	112	0	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	247	12	22	118	0	23	9	28	28	0	5
Total Analysis Volume [veh/h]	0	987	46	88	470	0	91	37	112	112	0	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	56	0	10	66	0	0	44	0	44	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	91	91	11	11	11	11
g / C, Green / Cycle	0.74	0.74	0.82	0.82	0.10	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.27	0.29	0.05	0.12	0.05	0.08	0.06	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1397	1324	1372	3130	222	219	79	187
d1, Uniform Delay [s]	5.28	5.39	1.80	1.95	46.53	48.16	46.19	44.65
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.75	0.87	0.02	0.10	1.21	3.66	207.28	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.37	0.39	0.06	0.15	0.41	0.68	1.43	0.10
d, Delay for Lane Group [s/veh]	6.04	6.26	1.82	2.05	47.74	51.82	253.47	44.88
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.97	4.07	0.24	0.72	2.42	4.20	6.53	0.48
50th-Percentile Queue Length [ft/ln]	99.15	101.76	5.97	17.88	60.58	105.09	163.30	12.07
95th-Percentile Queue Length [veh/ln]	7.14	7.33	0.43	1.29	4.36	7.57	11.76	0.87
95th-Percentile Queue Length [ft/ln]	178.48	183.17	10.75	32.18	109.05	189.15	293.94	21.72

**Movement, Approach, & Intersection Results**

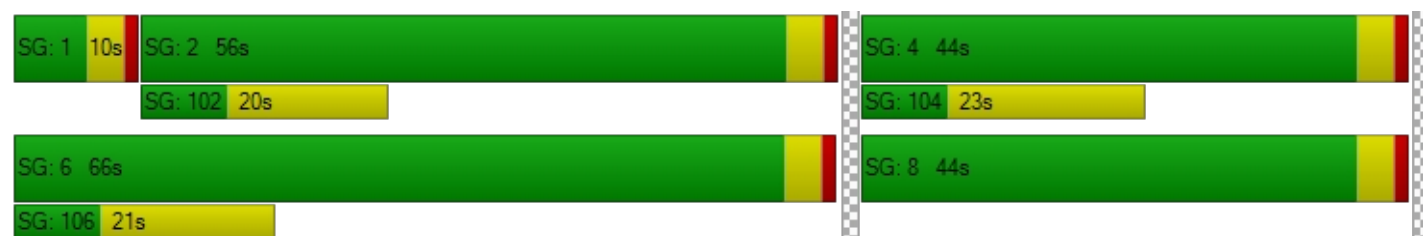
d_M, Delay for Movement [s/veh]	0.00	6.14	6.26	1.82	2.05	0.00	47.74	51.82	51.82	253.47	0.00	44.88
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	6.15			2.02			50.27			223.21		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	24.86											
Intersection LOS	C											
Intersection V/C	0.428											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.762			1.841			2.142		
Crosswalk LOS	F			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			1127			727			0		
d_b, Bicycle Delay [s]	15.29			10.47			22.27			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.412			2.020			1.956			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	31.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.215

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	435	383	282	0	36	95
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	435	383	282	0	36	95
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	109	96	71	0	9	24
Total Analysis Volume [veh/h]	435	383	282	0	36	95
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.34	0.00	0.00	0.00	0.22	0.13
d_M, Delay for Movement [s/veh]	9.25	0.00	0.00	0.00	31.30	14.52
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	1.52	0.00	0.00	0.00	1.48	1.48
95th-Percentile Queue Length [ft/ln]	38.04	0.00	0.00	0.00	37.05	37.05
d_A, Approach Delay [s/veh]	4.92		0.00		19.13	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	5.31					
Intersection LOS	D					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.037

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	334	847	368	0	5	81
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	334	847	368	0	5	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	84	212	92	0	1	20
Total Analysis Volume [veh/h]	334	847	368	0	5	81
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.28	0.01	0.00	0.00	0.04	0.12
d_M, Delay for Movement [s/veh]	9.20	0.00	0.00	0.00	32.78	11.53
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	1.16	0.00	0.00	0.00	0.55	0.55
95th-Percentile Queue Length [ft/ln]	28.93	0.00	0.00	0.00	13.78	13.78
d_A, Approach Delay [s/veh]	2.60		0.00		12.76	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.55					
Intersection LOS	D					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	26.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.262

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	1098	18	30	425	25	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1098	18	30	425	25	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	275	5	8	106	6	17
Total Analysis Volume [veh/h]	1098	18	30	425	25	67
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.05	0.00	0.09	0.26
d_M, Delay for Movement [s/veh]	0.00	0.00	11.04	0.00	25.23	26.38
Movement LOS	A	A	B	A	D	D
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.15	0.00	1.52	1.52
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.77	0.00	38.00	38.00
d_A, Approach Delay [s/veh]	0.00		0.73		26.07	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	1.64					
Intersection LOS	D					



**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.073

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	118	701	329	0	450	8	0	0	80	0	0	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	701	329	0	450	8	0	0	80	0	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	175	82	0	113	2	0	0	20	0	0	9
Total Analysis Volume [veh/h]	118	701	329	0	450	8	0	0	80	0	0	37
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.07
d_M, Delay for Movement [s/veh]	8.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.19	0.00	0.00	12.70
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.24
95th-Percentile Queue Length [ft/ln]	8.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.62	0.00	0.00	5.91
d_A, Approach Delay [s/veh]	0.89			0.00			10.19			12.70		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	1.34											
Intersection LOS	B											





*APPENDIX N-IV*

**EXISTING PLUS PROJECT  
FRIDAY DEPARTURE PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.341

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	84	603	69	115	338	117	123	262	31	53	479	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	603	69	115	338	117	123	262	31	53	479	119
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	151	17	29	85	29	31	66	8	13	120	30
Total Analysis Volume [veh/h]	84	603	69	115	338	117	123	262	31	53	479	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	10	39	0	16	47	0	11	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	66	66	6	67	67	9	9	9	13	13	13
g / C, Green / Cycle	0.05	0.60	0.60	0.05	0.60	0.60	0.08	0.08	0.08	0.12	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.04	0.03	0.08	0.08	0.07	0.05	0.06	0.02	0.08	0.07
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	179	3427	1082	188	2294	1087	152	297	141	426	656	207
d1, Uniform Delay [s]	50.77	9.79	9.11	50.96	9.41	9.42	49.51	49.30	49.51	43.13	47.06	46.16
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.90	0.11	0.11	3.19	0.12	0.26	9.63	2.43	6.30	0.13	1.58	2.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.47	0.18	0.06	0.61	0.13	0.14	0.81	0.65	0.70	0.12	0.73	0.57
d, Delay for Lane Group [s/veh]	52.67	9.90	9.22	54.15	9.53	9.68	59.15	51.72	55.81	43.26	48.64	48.66
Lane Group LOS	D	A	A	D	A	A	E	D	E	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.17	2.12	0.70	1.63	1.57	1.56	3.72	2.68	2.90	0.65	4.31	3.22
50th-Percentile Queue Length [ft/ln]	29.29	53.02	17.49	40.81	39.34	39.10	93.07	67.12	72.54	16.32	107.76	80.61
95th-Percentile Queue Length [veh/ln]	2.11	3.82	1.26	2.94	2.83	2.82	6.70	4.83	5.22	1.18	7.72	5.80
95th-Percentile Queue Length [ft/ln]	52.73	95.43	31.48	73.46	70.82	70.39	167.52	120.82	130.57	29.38	192.88	145.10

**Movement, Approach, & Intersection Results**

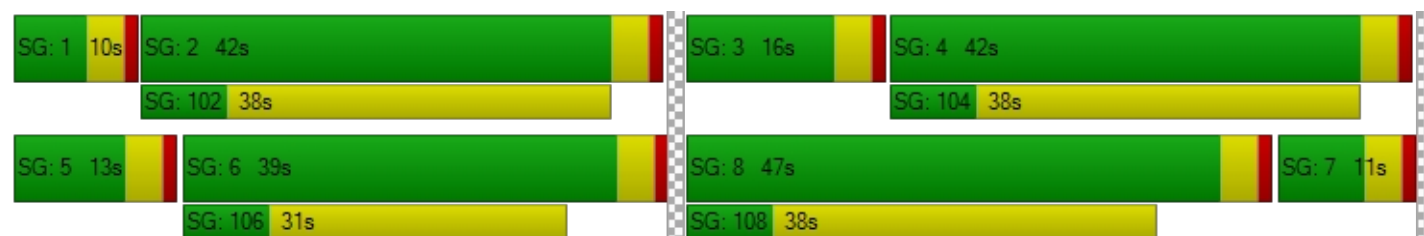
d_M, Delay for Movement [s/veh]	52.67	9.90	9.22	54.15	9.54	9.68	59.15	52.79	55.81	43.26	48.64	48.66
Movement LOS	D	A	A	D	A	A	E	D	E	D	D	D
d_A, Approach Delay [s/veh]	14.59			18.57			54.89			48.21		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	31.69											
Intersection LOS	C											
Intersection V/C	0.341											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.986			2.907			2.756			2.978		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			782			691		
d_b, Bicycle Delay [s]	23.56			25.57			20.40			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.975			1.873			1.788			1.918		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.280

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	17	562	311	36	479	7	20	31	13	338	36	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	562	311	36	479	7	20	31	13	338	36	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	141	78	9	120	2	5	8	3	85	9	0
Total Analysis Volume [veh/h]	17	562	311	36	479	7	20	31	13	338	36	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	31	0	10	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	71	4	72	72	5	5	5	14	14
g / C, Green / Cycle	0.02	0.64	0.04	0.66	0.66	0.05	0.05	0.05	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.02	0.10	0.05	0.01	0.02	0.01	0.10	0.10
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	42	3655	67	2491	1180	86	91	86	231	231
d1, Uniform Delay [s]	53.03	7.86	52.05	7.28	6.90	50.48	50.75	50.28	46.66	46.70
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.27	0.09	6.44	0.13	0.14	1.37	2.21	0.80	6.52	6.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.15	0.53	0.16	0.08	0.23	0.34	0.15	0.81	0.81
d, Delay for Lane Group [s/veh]	59.30	7.95	58.49	7.42	7.04	51.84	52.95	51.09	53.18	53.49
Lane Group LOS	E	A	E	A	A	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.54	1.70	1.10	1.70	0.82	0.56	0.88	0.36	5.35	5.42
50th-Percentile Queue Length [ft/ln]	13.40	42.57	27.40	42.48	20.46	14.08	22.06	9.07	133.87	135.50
95th-Percentile Queue Length [veh/ln]	0.96	3.07	1.97	3.06	1.47	1.01	1.59	0.65	9.15	9.24
95th-Percentile Queue Length [ft/ln]	24.12	76.63	49.32	76.47	36.83	25.35	39.71	16.33	228.75	230.96

**Movement, Approach, & Intersection Results**

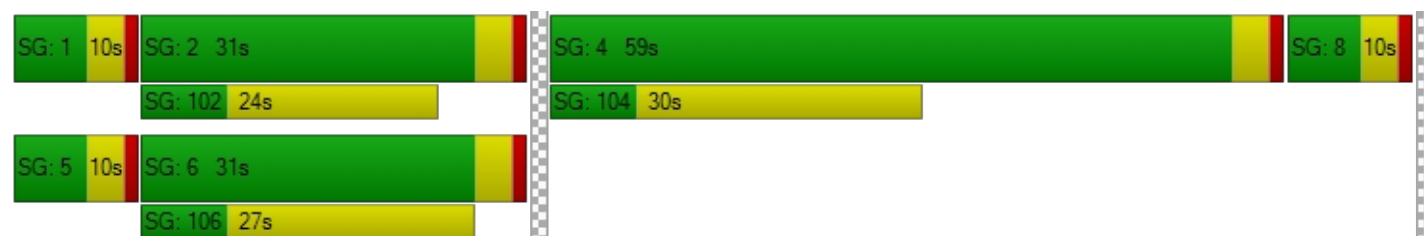
d_M, Delay for Movement [s/veh]	59.30	7.95	0.00	58.49	7.35	7.04	51.84	52.95	51.09	53.32	53.49	0.00
Movement LOS	E	A		E	A	A	D	D	D	D	D	
d_A, Approach Delay [s/veh]	9.46			10.87			52.23			53.33		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	22.38											
Intersection LOS	C											
Intersection V/C	0.280											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.757			2.171			2.093		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			109			1000		
d_b, Bicycle Delay [s]	31.31			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	1.878			1.847			1.665			2.177		
Bicycle LOS	A			A			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	33	677	37	113	557	5	17	41	26	81	67	318
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	677	37	113	557	5	17	41	26	81	67	318
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	169	9	28	139	1	4	10	7	20	17	80
Total Analysis Volume [veh/h]	33	677	37	113	557	5	17	41	26	81	67	318
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	64	64	16	76	76	18	18	18	18	18	38
g / C, Green / Cycle	0.04	0.58	0.58	0.15	0.69	0.69	0.17	0.17	0.17	0.17	0.17	0.35
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.19	0.03	0.15	0.00	0.01	0.02	0.01	0.05	0.04	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	66	1098	1040	511	2613	1238	280	317	300	302	317	629
d1, Uniform Delay [s]	51.99	12.16	12.10	41.42	6.29	5.38	38.52	39.00	38.72	39.96	39.55	28.27
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.19
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	0.83	0.85	0.22	0.19	0.01	0.09	0.18	0.12	0.47	0.33	1.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.34	0.33	0.22	0.21	0.00	0.06	0.13	0.09	0.27	0.21	0.51
d, Delay for Lane Group [s/veh]	57.83	12.99	12.96	41.64	6.47	5.39	38.61	39.18	38.84	40.43	39.88	29.39
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.00	4.85	4.50	1.37	2.23	0.04	0.39	0.96	0.61	1.95	1.60	6.76
50th-Percentile Queue Length [ft/ln]	25.00	121.19	112.60	34.26	55.85	0.88	9.85	24.03	15.13	48.82	39.89	168.99
95th-Percentile Queue Length [veh/ln]	1.80	8.46	7.98	2.47	4.02	0.06	0.71	1.73	1.09	3.52	2.87	11.02
95th-Percentile Queue Length [ft/ln]	45.00	211.46	199.62	61.67	100.53	1.59	17.74	43.26	27.24	87.88	71.80	275.59

**Movement, Approach, & Intersection Results**

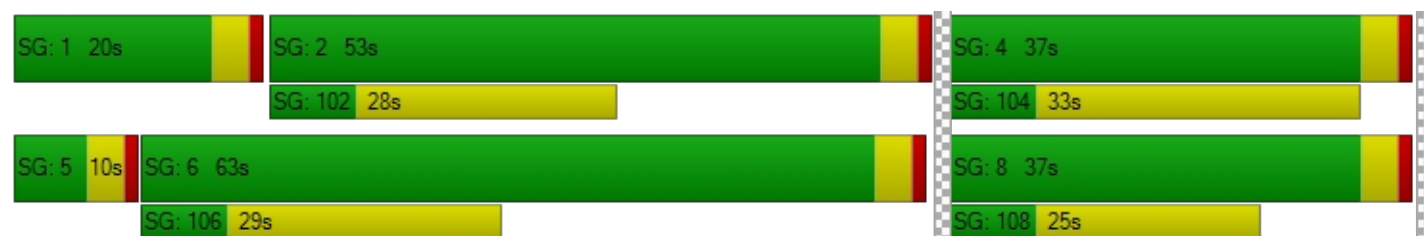
d_M, Delay for Movement [s/veh]	57.83	12.97	12.96	41.64	6.47	5.39	38.61	39.18	38.84	40.43	39.88	29.39
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	14.95			12.35			38.96			32.82		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	19.31											
Intersection LOS	B											
Intersection V/C	0.421											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.700			2.863			2.187			2.438		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.176			2.116			1.698			2.329		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	93.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.378

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	51	38	5	35	9	3	37	31	46	44	13
Total Analysis Volume [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	39	0	0	30	0	0	41	41	0	41	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	11	11	58	11	11	11
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.40	0.10	0.10	0.53	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.08	0.01	0.10	0.01	0.08	0.07	0.10	0.06	0.06
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	711	711	711	711	711	115	192	958	88	192	181
d1, Uniform Delay [s]	23.16	23.29	21.97	20.33	22.33	44.74	48.19	12.93	46.74	47.42	47.26
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	1.32	0.68	0.07	0.84	0.35	6.32	0.28	501.31	3.24	2.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.33	0.34	0.21	0.03	0.25	0.10	0.77	0.13	2.10	0.62	0.59
d, Delay for Lane Group [s/veh]	24.41	24.61	22.65	20.40	23.18	45.09	54.51	13.21	548.06	50.66	50.25
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.47	4.67	2.70	0.30	3.25	0.28	4.26	1.61	14.50	3.28	2.94
50th-Percentile Queue Length [ft/ln]	111.77	116.74	67.59	7.41	81.14	7.09	106.45	40.23	362.49	82.11	73.39
95th-Percentile Queue Length [veh/ln]	7.94	8.21	4.87	0.53	5.84	0.51	7.64	2.90	24.81	5.91	5.28
95th-Percentile Queue Length [ft/ln]	198.47	205.34	121.66	13.34	146.04	12.77	191.05	72.41	620.35	147.80	132.11

**Movement, Approach, & Intersection Results**

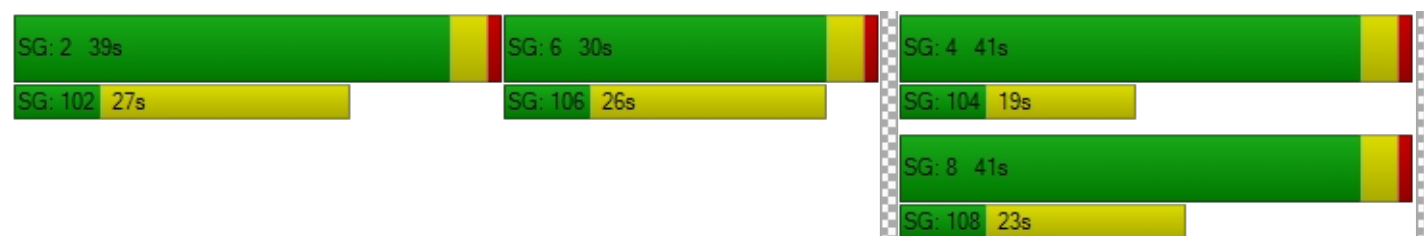
d_M, Delay for Movement [s/veh]	24.43	24.61	22.65	20.40	23.18	23.18	45.09	54.51	13.21	548.06	50.53	50.25
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	24.06			22.92			35.90			274.32		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	93.51											
Intersection LOS	F											
Intersection V/C	0.378											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.666			2.115			2.460			2.317		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			473			673			673		
d_b, Bicycle Delay [s]	25.57			32.07			24.22			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.601			1.883			2.027			1.897		
Bicycle LOS	B			A			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	90	10	168	409	295	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	10	168	409	295	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	42	102	74	7
Total Analysis Volume [veh/h]	90	10	168	409	295	26
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	95	95	95	95
g / C, Green / Cycle	0.07	0.07	0.86	0.86	0.86	0.86
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	0.09	0.22	0.16	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	119	119	1518	1636	1636	1550
d1, Uniform Delay [s]	50.40	48.15	1.17	1.35	1.26	1.08
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.27	0.30	0.15	0.37	0.24	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.08	0.11	0.25	0.18	0.02
d, Delay for Lane Group [s/veh]	59.67	48.45	1.32	1.72	1.50	1.10
Lane Group LOS	E	D	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.73	0.27	0.31	0.87	0.58	0.04
50th-Percentile Queue Length [ft/ln]	68.37	6.69	7.84	21.85	14.60	1.11
95th-Percentile Queue Length [veh/ln]	4.92	0.48	0.56	1.57	1.05	0.08
95th-Percentile Queue Length [ft/ln]	123.07	12.04	14.12	39.34	26.28	2.00

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.67	48.45	1.32	1.72	1.50	1.10
Movement LOS	E	D	A	A	A	A
d_A, Approach Delay [s/veh]	58.55		1.60		1.47	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	7.27					
Intersection LOS	A					
Intersection V/C	0.286					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.284	2.236	2.216
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.084	4.662
Bicycle LOS	D	F	E

**Sequence**


Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.419

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	78	531	98	45	454	16	18	239	97	171	458	135
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	531	98	45	454	16	18	239	97	171	458	135
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	133	25	11	114	4	5	60	24	43	115	34
Total Analysis Volume [veh/h]	78	531	98	45	454	16	18	239	97	171	458	135
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	10	41	0	20	49	0	10	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	74	65	65	74	64	64	28	18	18	28	22	22
g / C, Green / Cycle	0.67	0.59	0.59	0.67	0.59	0.59	0.26	0.16	0.16	0.26	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.17	0.03	0.13	0.13	0.01	0.09	0.09	0.10	0.17	0.15
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1189	1128	1069	1143	1112	1053	271	313	296	406	372	353
d1, Uniform Delay [s]	6.21	10.99	10.88	6.09	10.86	10.84	30.78	42.37	42.11	33.67	42.68	42.04
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.66	0.65	0.01	0.45	0.47	0.10	1.63	1.49	0.69	5.46	3.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.29	0.28	0.04	0.22	0.22	0.07	0.57	0.53	0.42	0.85	0.79
d, Delay for Lane Group [s/veh]	6.31	11.65	11.53	6.11	11.31	11.31	30.88	44.00	43.60	34.36	48.14	45.92
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.62	4.02	3.59	0.33	2.86	2.68	0.37	4.58	4.05	3.83	8.79	7.48
50th-Percentile Queue Length [ft/ln]	15.44	100.55	89.65	8.36	71.42	67.10	9.22	114.61	101.33	95.83	219.84	186.92
95th-Percentile Queue Length [veh/ln]	1.11	7.24	6.45	0.60	5.14	4.83	0.66	8.10	7.30	6.90	13.66	11.96
95th-Percentile Queue Length [ft/ln]	27.79	181.00	161.37	15.04	128.56	120.77	16.60	202.40	182.39	172.49	341.42	299.02

**Movement, Approach, & Intersection Results**

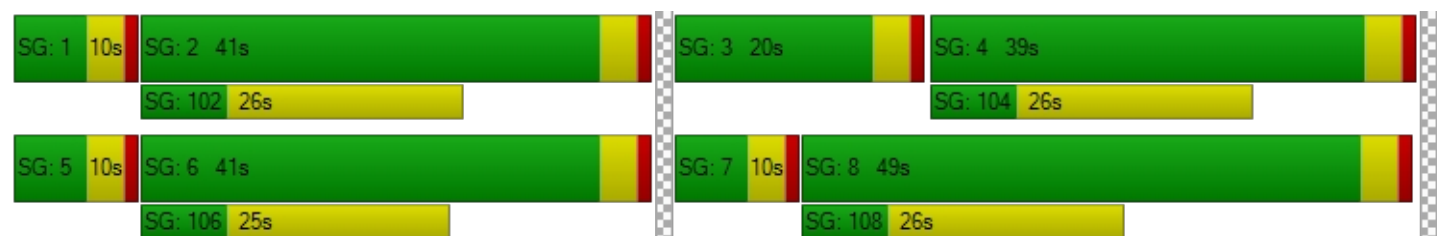
d_M, Delay for Movement [s/veh]	6.31	11.61	11.53	6.11	11.31	11.31	30.88	43.89	43.60	34.36	47.45	45.92
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	11.01			10.85			43.15			44.25		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.69											
Intersection LOS	C											
Intersection V/C	0.419											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.632			2.549			2.553			2.572		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			673			818			636		
d_b, Bicycle Delay [s]	24.22			24.22			19.20			25.57		
I_b,int, Bicycle LOS Score for Intersection	2.143			1.984			1.852			2.190		
Bicycle LOS	B			A			A			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.522

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	91	540	112	95	552	102	109	317	70	283	640	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	540	112	95	552	102	109	317	70	283	640	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	135	28	24	138	26	27	79	18	71	160	23
Total Analysis Volume [veh/h]	91	540	112	95	552	102	109	317	70	283	640	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	14	31	0	38	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	67	57	57	67	57	57	35	15	15	35	25	25
g / C, Green / Cycle	0.61	0.52	0.52	0.61	0.52	0.52	0.32	0.13	0.13	0.32	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.05	0.18	0.17	0.05	0.18	0.17	0.06	0.11	0.10	0.16	0.17	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	987	985	933	987	985	934	392	253	240	491	847	401
d1, Uniform Delay [s]	8.95	15.60	15.41	8.98	15.58	15.40	27.07	46.32	46.05	30.18	39.98	34.99
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.98	0.95	0.04	0.98	0.95	0.38	5.91	5.04	1.07	1.40	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.35	0.33	0.10	0.35	0.33	0.28	0.80	0.77	0.58	0.76	0.22
d, Delay for Lane Group [s/veh]	9.14	16.58	16.35	9.02	16.56	16.36	27.45	52.24	51.10	31.25	41.38	35.27
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.92	5.24	4.63	0.93	5.24	4.66	2.12	5.80	5.16	6.16	8.20	2.01
50th-Percentile Queue Length [ft/ln]	23.12	130.99	115.76	23.15	130.95	116.47	52.97	145.03	129.03	153.96	204.90	50.21
95th-Percentile Queue Length [veh/ln]	1.66	8.99	8.16	1.67	8.99	8.20	3.81	9.75	8.89	10.23	12.89	3.62
95th-Percentile Queue Length [ft/ln]	41.61	224.84	203.98	41.67	224.79	204.96	95.35	243.77	222.17	255.70	322.28	90.38

**Movement, Approach, & Intersection Results**

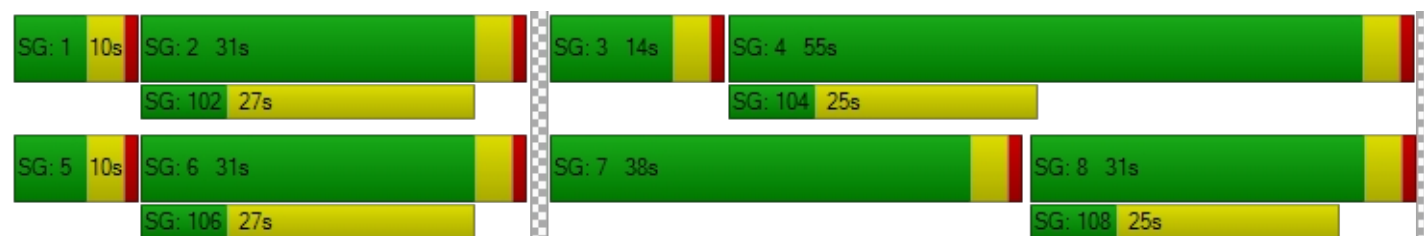
d_M, Delay for Movement [s/veh]	9.14	16.50	16.35	9.02	16.48	16.36	27.45	51.83	51.10	31.25	41.38	35.27
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	15.58			15.52			46.37			38.00		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	28.22											
Intersection LOS	C											
Intersection V/C	0.522											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.692			2.637			2.638			2.785		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			491			927		
d_b, Bicycle Delay [s]	31.31			31.31			31.31			15.82		
I_b,int, Bicycle LOS Score for Intersection	2.173			2.178			1.969			2.395		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	92	243	67	228	415	431	91	399	63	219	547	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	243	67	228	415	431	91	399	63	219	547	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	61	17	57	104	108	23	100	16	55	137	11
Total Analysis Volume [veh/h]	92	243	67	228	415	431	91	399	63	219	547	44
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	17	38	0	11	48	0	13	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	72	60	60	72	63	63	7	17	17	9	19	19
g / C, Green / Cycle	0.66	0.55	0.55	0.66	0.57	0.57	0.06	0.15	0.15	0.08	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.04	0.13	0.22	0.24	0.05	0.13	0.12	0.06	0.14	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1025	2085	988	1216	1080	1023	115	294	278	280	648	307
d1, Uniform Delay [s]	6.85	11.97	11.64	7.44	13.12	13.48	50.77	45.07	44.81	49.68	44.22	38.81
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.11	0.13	0.07	1.04	1.27	11.32	5.78	5.04	4.75	3.11	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.12	0.07	0.19	0.38	0.42	0.79	0.82	0.79	0.78	0.84	0.14
d, Delay for Lane Group [s/veh]	7.02	12.08	11.77	7.51	14.15	14.75	62.10	50.85	49.85	54.42	47.34	39.02
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.79	1.45	0.79	2.01	5.78	6.19	2.83	6.84	6.15	3.13	7.46	1.03
50th-Percentile Queue Length [ft/ln]	19.67	36.14	19.84	50.27	144.39	154.87	70.71	170.88	153.68	78.32	186.48	25.79
95th-Percentile Queue Length [veh/ln]	1.42	2.60	1.43	3.62	9.72	10.28	5.09	11.12	10.21	5.64	11.94	1.86
95th-Percentile Queue Length [ft/ln]	35.41	65.04	35.71	90.49	242.93	256.91	127.27	278.08	255.33	140.97	298.46	46.42

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	7.02	12.08	11.77	7.51	14.15	14.75	62.10	50.46	49.85	54.42	47.34	39.02
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.87			12.98			52.30			48.80		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	30.56											
Intersection LOS	C											
Intersection V/C	0.532											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.641			2.593			2.703			2.997		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			618			800			836		
d_b, Bicycle Delay [s]	30.56			26.25			19.80			18.62		
I_b,int, Bicycle LOS Score for Intersection	1.891			2.446			2.016			2.228		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	9	13	18	754	15	340	44	651	10	24	604	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	13	18	754	15	340	44	651	10	24	604	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	5	189	4	85	11	163	3	6	151	46
Total Analysis Volume [veh/h]	9	13	18	754	15	340	44	651	10	24	604	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	28	36	66	66	66	58	58	89
g / C, Green / Cycle	0.04	0.04	0.04	0.25	0.33	0.60	0.60	0.60	0.52	0.52	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.22	0.20	0.02	0.18	0.18	0.01	0.16	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	74	70	878	587	1010	1142	1082	812	1991	1460
d1, Uniform Delay [s]	51.07	51.17	51.33	39.36	31.12	8.98	10.67	10.66	12.64	14.83	2.19
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	1.11	1.90	2.58	1.01	0.02	0.67	0.70	0.07	0.39	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.18	0.26	0.86	0.60	0.04	0.30	0.30	0.03	0.30	0.13
d, Delay for Lane Group [s/veh]	52.02	52.28	53.23	41.94	32.12	8.99	11.34	11.36	12.71	15.22	2.22
Lane Group LOS	D	D	D	D	C	A	B	B	B	B	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.26	0.37	0.52	9.93	8.00	0.42	4.07	3.84	0.30	4.29	0.60
50th-Percentile Queue Length [ft/ln]	6.42	9.24	12.97	248.31	200.00	10.61	101.63	95.96	7.46	107.28	15.11
95th-Percentile Queue Length [veh/ln]	0.46	0.67	0.93	15.10	12.64	0.76	7.32	6.91	0.54	7.69	1.09
95th-Percentile Queue Length [ft/ln]	11.56	16.64	23.34	377.53	315.97	19.09	182.94	172.73	13.44	192.22	27.20

**Movement, Approach, & Intersection Results**

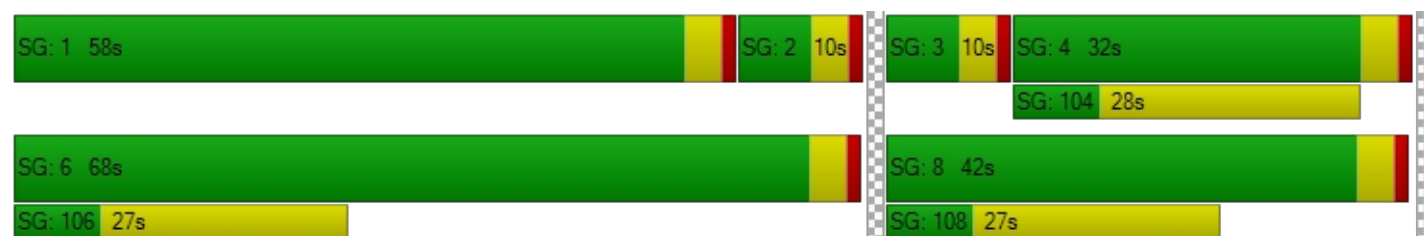
d_M, Delay for Movement [s/veh]	52.02	52.28	53.23	41.94	32.12	32.12	8.99	11.34	11.36	12.71	15.22	2.22
Movement LOS	D	D	D	D	C	C	A	B	B	B	B	A
d_A, Approach Delay [s/veh]	52.65			38.80			11.20			12.20		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.61											
Intersection LOS	C											
Intersection V/C	0.454											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.196			2.504			2.646			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			3.389			2.141			2.230		
Bicycle LOS	A			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 10: Raymond Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.545

#### Intersection Setup

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	89	57	76	41	52	35	45	1172	230	91	669	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	57	76	41	52	35	45	1172	230	91	669	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	14	19	10	13	9	11	293	58	23	167	9
Total Analysis Volume [veh/h]	89	57	76	41	52	35	45	1172	230	91	669	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	52	0	10	49	0	10	38	0	10	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	8	7	7	6	6	6	87	77	77	87	78	78
g / C, Green / Cycle	0.07	0.06	0.06	0.05	0.05	0.05	0.79	0.70	0.70	0.79	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.02	0.02	0.03	0.39	0.37	0.05	0.19	0.19
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	160	121	115	191	98	93	1371	1328	1258	1143	1347	1277
d1, Uniform Delay [s]	48.35	49.73	50.36	50.67	50.73	50.69	2.56	8.14	7.92	2.63	5.76	5.74
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.03	2.80	6.31	0.56	3.38	3.34	0.01	1.67	1.60	0.14	0.49	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.47	0.66	0.22	0.46	0.45	0.03	0.55	0.53	0.08	0.27	0.27
d, Delay for Lane Group [s/veh]	51.38	52.52	56.67	51.23	54.11	54.03	2.57	9.81	9.52	2.76	6.26	6.25
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.54	1.61	2.24	1.13	1.31	1.20	0.17	8.16	7.20	0.39	2.88	2.68
50th-Percentile Queue Length [ft/ln]	63.61	40.18	56.11	28.14	32.71	29.93	4.24	204.07	180.10	9.70	71.94	66.93
95th-Percentile Queue Length [veh/ln]	4.58	2.89	4.04	2.03	2.36	2.15	0.31	12.85	11.61	0.70	5.18	4.82
95th-Percentile Queue Length [ft/ln]	114.51	72.32	101.00	50.65	58.88	53.87	7.64	321.21	290.14	17.47	129.50	120.48

**Movement, Approach, & Intersection Results**

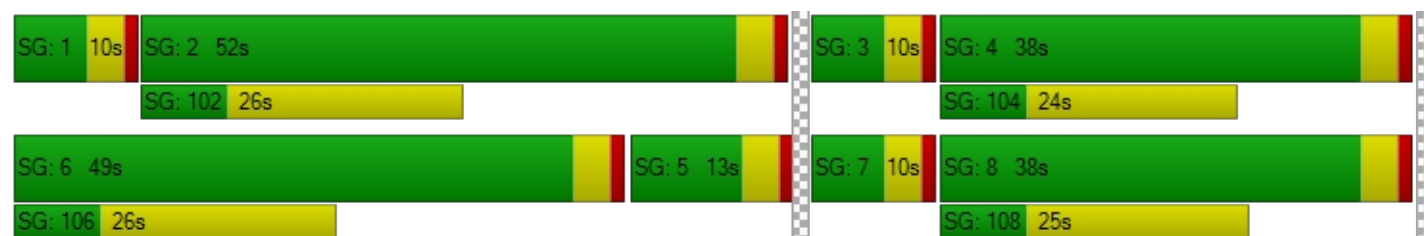
d_M, Delay for Movement [s/veh]	51.38	52.52	56.67	51.23	54.10	54.03	2.57	9.70	9.52	2.76	6.25	6.25
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.49			53.16			9.45			5.85		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	14.28											
Intersection LOS	B											
Intersection V/C	0.545											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.518			2.252			2.839			2.718		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			818			618			618		
d_b, Bicycle Delay [s]	17.47			19.20			26.25			26.25		
I_b,int, Bicycle LOS Score for Intersection	1.926			1.665			2.753			2.215		
Bicycle LOS	A			A			C			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	6.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	25	24	31	31	19	19	24	1146	24	45	707	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	24	31	31	19	19	24	1146	24	45	707	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	6	8	8	5	5	6	287	6	11	177	7
Total Analysis Volume [veh/h]	25	24	31	31	19	19	24	1146	24	45	707	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	69	0	10	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	88	88	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.88	0.80	0.80	0.88	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.02	0.02	0.02	0.01	0.32	0.32	0.03	0.20	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	90	95	90	105	90	1582	1519	1439	1496	1543	1461
d1, Uniform Delay [s]	50.30	50.24	50.47	50.47	50.68	0.84	3.24	3.23	0.85	2.43	2.42
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.67	1.36	2.23	1.56	3.08	0.00	0.78	0.81	0.04	0.38	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.25	0.34	0.30	0.42	0.02	0.40	0.39	0.03	0.25	0.24
d, Delay for Lane Group [s/veh]	51.97	51.60	52.70	52.04	53.76	0.85	4.02	4.04	0.89	2.81	2.82
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.70	0.67	0.88	0.87	1.09	0.02	3.18	3.00	0.06	1.51	1.42
50th-Percentile Queue Length [ft/ln]	17.61	16.79	22.01	21.75	27.30	0.57	79.49	74.95	1.39	37.77	35.44
95th-Percentile Queue Length [veh/ln]	1.27	1.21	1.58	1.57	1.97	0.04	5.72	5.40	0.10	2.72	2.55
95th-Percentile Queue Length [ft/ln]	31.69	30.22	39.62	39.15	49.15	1.02	143.08	134.91	2.50	67.98	63.79

**Movement, Approach, & Intersection Results**

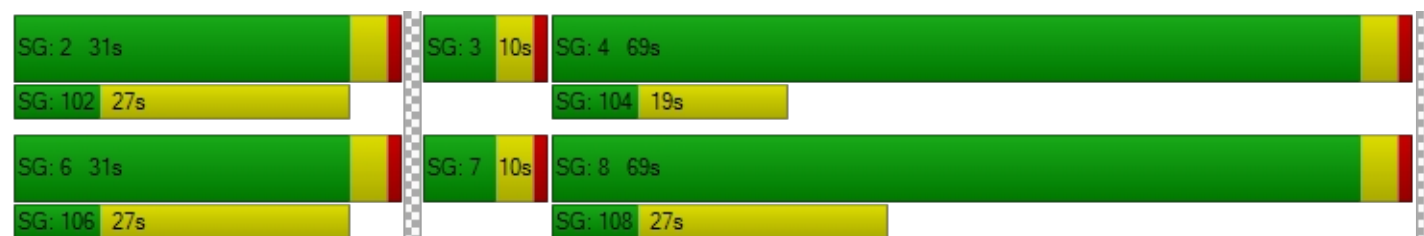
d_M, Delay for Movement [s/veh]	51.97	51.60	52.70	52.04	53.76	53.76	0.85	4.03	4.04	0.89	2.81	2.82
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.14			52.98			3.96			2.70		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	6.91											
Intersection LOS	A											
Intersection V/C	0.385											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.234			2.025			2.724			2.741		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1182			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.20			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.692			1.673			2.545			2.201		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**





Control Type:  
Analysis Method:  
Analysis Period:

Signalized  
HCM 6th Edition  
15 minutes

Delay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):

36.0  
D  
0.504

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	94	273	92	110	310	195	187	889	94	113	543	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	94	273	92	110	310	195	187	889	94	113	543	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	68	23	28	78	49	47	222	24	28	136	34
Total Analysis Volume [veh/h]	94	273	92	110	310	195	187	889	94	113	543	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	14	37	37	15	50	0	12	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	51	51	6	50	83	19	29	29	8	19	19
g / C, Green / Cycle	0.06	0.46	0.46	0.05	0.45	0.76	0.17	0.27	0.27	0.07	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.05	0.03	0.08	0.11	0.05	0.23	0.05	0.06	0.14	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	153	1749	828	187	1708	1360	592	1016	481	132	653	309
d1, Uniform Delay [s]	50.84	17.28	16.90	50.92	18.17	3.69	40.14	38.56	31.17	50.43	44.06	40.88
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.96	0.19	0.27	2.91	0.23	0.05	0.30	2.55	0.20	14.22	2.85	1.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.61	0.16	0.11	0.59	0.18	0.14	0.32	0.87	0.20	0.85	0.83	0.44
d, Delay for Lane Group [s/veh]	54.80	17.47	17.17	53.83	18.41	3.74	40.45	41.11	31.36	64.65	46.91	41.87
Lane Group LOS	D	B	B	D	B	A	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.72	2.04	1.38	1.56	2.40	1.02	2.25	11.68	1.96	3.59	7.37	3.41
50th-Percentile Queue Length [ft/ln]	68.00	51.11	34.49	38.89	60.12	25.49	56.24	292.11	49.04	89.77	184.18	85.34
95th-Percentile Queue Length [veh/ln]	4.90	3.68	2.48	2.80	4.33	1.84	4.05	17.29	3.53	6.46	11.82	6.14
95th-Percentile Queue Length [ft/ln]	122.40	92.00	62.09	70.01	108.22	45.88	101.23	432.26	88.28	161.59	295.47	153.62

**Movement, Approach, & Intersection Results**

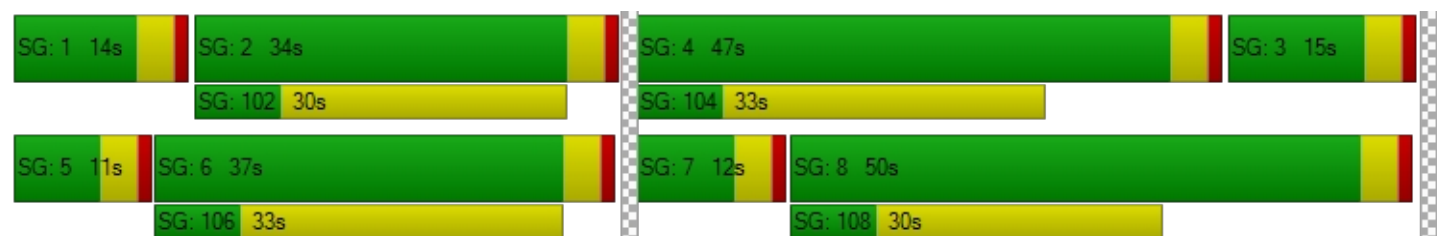
d_M, Delay for Movement [s/veh]	54.80	17.47	17.17	53.83	18.41	3.74	40.45	41.11	31.36	64.65	46.91	41.87
Movement LOS	D	B	B	D	B	A	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	25.06			20.09			40.22			48.57		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.03											
Intersection LOS	D											
Intersection V/C	0.504											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.621			2.772			3.016			2.769		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			836			782		
d_b, Bicycle Delay [s]	29.09			26.95			18.62			20.40		
I_b,int, Bicycle LOS Score for Intersection	1.938			2.067			2.525			2.214		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






### Intersection Level Of Service Report

#### Intersection 13: SR-57 SB Ramps at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	16.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

#### Intersection Setup

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

#### Volumes

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	77	0	149	0	875	589	228	723	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	77	0	149	0	875	589	228	723	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	19	0	37	0	219	147	57	181	0
Total Analysis Volume [veh/h]	0	0	0	77	0	149	0	875	589	228	723	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lag	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	73	0	0	19	0	18	37	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		11	11	72	72	14	91
g / C, Green / Cycle		0.10	0.10	0.66	0.66	0.13	0.82
(v / s)_i Volume / Saturation Flow Rate		0.04	0.08	0.23	0.33	0.13	0.19
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		188	188	2503	1186	230	3127
d1, Uniform Delay [s]		46.08	48.09	8.32	9.52	47.89	2.13
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.43	7.35	0.39	1.49	25.40	0.17
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.41	0.79	0.35	0.50	0.99	0.23
d, Delay for Lane Group [s/veh]		47.51	55.44	8.71	11.01	73.28	2.30
Lane Group LOS		D	E	A	B	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.04	4.36	4.42	7.09	7.83	1.20
50th-Percentile Queue Length [ft/ln]		51.10	109.02	110.39	177.13	195.73	30.05
95th-Percentile Queue Length [veh/ln]		3.68	7.79	7.86	11.45	12.42	2.16
95th-Percentile Queue Length [ft/ln]		91.98	194.63	196.55	286.27	310.45	54.09

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	47.51	47.51	55.44	0.00	8.71	11.01	73.28	2.30	0.00
Movement LOS				D	D	E		A	B	E	A	
d_A, Approach Delay [s/veh]	0.00			52.74			9.64			19.32		
Approach LOS	A			D			A			B		
d_I, Intersection Delay [s/veh]	16.81											
Intersection LOS	B											
Intersection V/C	0.602											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.230	1.835	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1255	273	600
d_b, Bicycle Delay [s]	55.00	7.64	41.02	26.95
I_b,int, Bicycle LOS Score for Intersection	4.132	1.933	2.365	2.344
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.553

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	406	0	319	0	0	0	311	645	0	0	535	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	406	0	319	0	0	0	311	645	0	0	535	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	102	0	80	0	0	0	78	161	0	0	134	29
Total Analysis Volume [veh/h]	406	0	319	0	0	0	311	645	0	0	535	114
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	50	0	0	0	0	0	41	60	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19		21	83	58	58
g / C, Green / Cycle	0.17	0.17	0.17		0.19	0.76	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.13		0.17	0.17	0.17	0.18
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	306	306	306		348	2877	1002	949
d1, Uniform Delay [s]	44.01	43.78	43.42		43.25	3.91	14.81	14.98
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.46	4.67	3.72		8.03	0.18	0.86	0.98
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.79	0.75		0.89	0.22	0.32	0.34
d, Delay for Lane Group [s/veh]	49.47	48.45	47.13		51.28	4.09	15.67	15.97
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.03	6.72	6.25		8.96	1.83	4.76	4.83
50th-Percentile Queue Length [ft/ln]	175.83	167.94	156.17		223.91	45.87	119.05	120.86
95th-Percentile Queue Length [veh/ln]	11.38	10.97	10.35		13.86	3.30	8.34	8.44
95th-Percentile Queue Length [ft/ln]	284.56	274.20	258.64		346.61	82.56	208.52	211.00

**Movement, Approach, & Intersection Results**

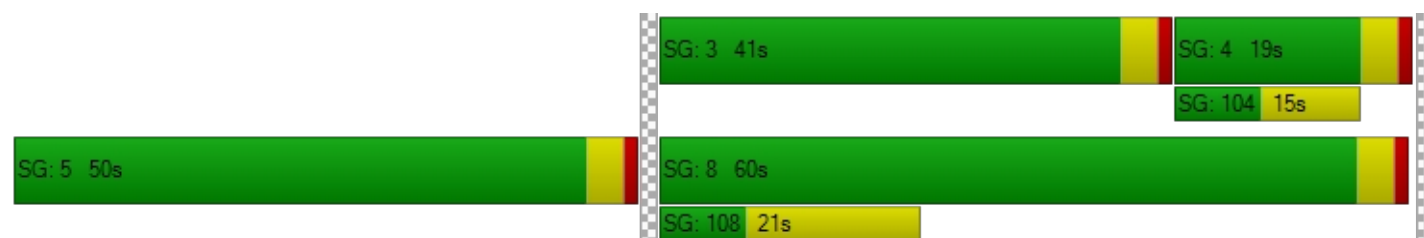
d_M, Delay for Movement [s/veh]	49.07	0.00	47.47	0.00	0.00	0.00	51.28	4.09	0.00	0.00	15.79	15.97
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	48.39			0.00			19.44			15.82		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	27.44											
Intersection LOS	C											
Intersection V/C	0.553											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.185	1.847	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1018	273
d_b, Bicycle Delay [s]	55.00	55.00	13.25	41.02
I_b,int, Bicycle LOS Score for Intersection	5.329	4.132	2.348	2.095
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	3.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.223

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	19	384	12	10	701	6	7	5	16	3	9	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	384	12	10	701	6	7	5	16	3	9	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	96	3	3	175	2	2	1	4	1	2	2
Total Analysis Volume [veh/h]	19	384	12	10	701	6	7	5	16	3	9	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	98	98	98	98	98	98	3	3
g / C, Green / Cycle	0.90	0.90	0.90	0.90	0.90	0.90	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.11	0.11	0.01	0.19	0.19	0.02	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1590	1701	1612	1613	1701	1612	98	95
d1, Uniform Delay [s]	0.61	0.67	0.67	0.60	0.74	0.74	52.34	52.10
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.14	0.15	0.01	0.29	0.30	1.58	1.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.01	0.12	0.12	0.01	0.21	0.21	0.29	0.21
d, Delay for Lane Group [s/veh]	0.62	0.82	0.82	0.61	1.03	1.04	53.92	53.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.01	0.14	0.13	0.01	0.27	0.26	0.80	0.57
50th-Percentile Queue Length [ft/ln]	0.30	3.43	3.31	0.15	6.78	6.58	20.06	14.22
95th-Percentile Queue Length [veh/ln]	0.02	0.25	0.24	0.01	0.49	0.47	1.44	1.02
95th-Percentile Queue Length [ft/ln]	0.53	6.17	5.95	0.28	12.21	11.84	36.10	25.59

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.62	0.82	0.82	0.61	1.04	1.04	53.92	53.92	53.92	53.20	53.20	53.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	0.81			1.03			53.92			53.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	3.09											
Intersection LOS	A											
Intersection V/C	0.223											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.535			2.537			1.782			1.762		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.902			2.151			1.606			1.593		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.486

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	70	632	124	66	866	88	87	281	111	175	309	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	632	124	66	866	88	87	281	111	175	309	58
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	158	31	17	217	22	22	70	28	44	77	15
Total Analysis Volume [veh/h]	70	632	124	66	866	88	87	281	111	175	309	58
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	51	0	10	47	0	12	34	0	15	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	42	32	32	42	32	32	61	49	49	61	51	51
g / C, Green / Cycle	0.38	0.29	0.29	0.38	0.29	0.29	0.55	0.44	0.44	0.55	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.07	0.04	0.26	0.25	0.05	0.07	0.06	0.10	0.08	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	324	1115	528	523	556	527	995	1681	796	1001	1754	831
d1, Uniform Delay [s]	22.17	32.97	29.52	22.12	37.34	36.91	11.74	18.48	18.24	12.38	17.37	16.49
k, delay calibration	0.11	0.11	0.11	0.11	0.17	0.16	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.46	0.23	0.11	8.19	6.33	0.04	0.21	0.37	0.38	0.22	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.22	0.57	0.23	0.13	0.90	0.87	0.09	0.17	0.14	0.17	0.18	0.07
d, Delay for Lane Group [s/veh]	22.50	33.43	29.75	22.22	45.53	43.24	11.78	18.69	18.60	12.76	17.59	16.65
Lane Group LOS	C	C	C	C	D	D	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.21	7.17	2.53	1.12	13.91	12.38	1.00	2.19	1.75	2.21	2.33	0.85
50th-Percentile Queue Length [ft/ln]	30.15	179.18	63.16	28.06	347.82	309.53	25.10	54.83	43.80	55.33	58.28	21.23
95th-Percentile Queue Length [veh/ln]	2.17	11.56	4.55	2.02	20.03	18.15	1.81	3.95	3.15	3.98	4.20	1.53
95th-Percentile Queue Length [ft/ln]	54.27	288.95	113.70	50.50	500.75	453.79	45.19	98.69	78.83	99.60	104.91	38.22

**Movement, Approach, & Intersection Results**

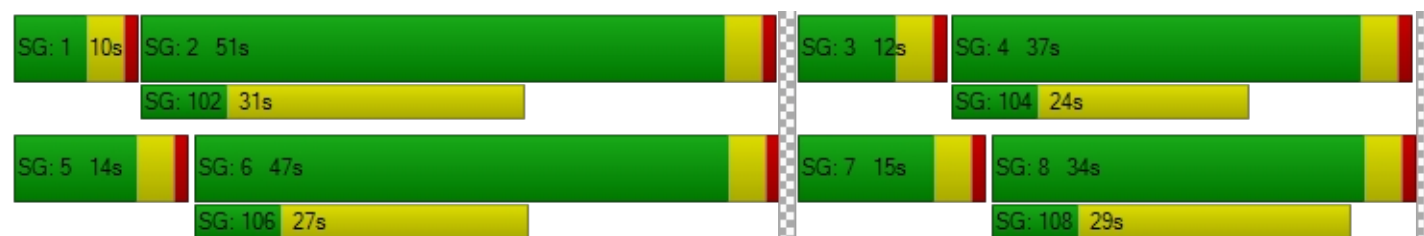
d_M, Delay for Movement [s/veh]	22.50	33.43	29.75	22.22	44.55	43.24	11.78	18.69	18.60	12.76	17.59	16.65
Movement LOS	C	C	C	C	D	D	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	31.95			43.00			17.42			15.93		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	30.42											
Intersection LOS	C											
Intersection V/C	0.486											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.899			2.719			2.647			2.656		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			782			545			600		
d_b, Bicycle Delay [s]	18.04			20.40			29.09			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.241			2.401			1.955			2.007		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.380

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	87	297	128	30	650	82	57	339	87	77	245	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	297	128	30	650	82	57	339	87	77	245	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	74	32	8	163	21	14	85	22	19	61	9
Total Analysis Volume [veh/h]	87	297	128	30	650	82	57	339	87	77	245	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	36	0	34	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27	25	25	25	5	58	58	5	58	58
g / C, Green / Cycle	0.25	0.25	0.25	0.23	0.23	0.23	0.05	0.52	0.52	0.05	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.07	0.02	0.20	0.19	0.03	0.09	0.05	0.02	0.06	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	224	942	446	393	437	414	83	1987	941	176	2003	949
d1, Uniform Delay [s]	32.72	33.78	33.53	33.19	40.88	40.49	51.75	13.77	13.17	50.77	13.16	12.55
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	0.19	0.35	0.08	5.71	4.73	9.75	0.19	0.19	1.71	0.13	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.32	0.29	0.08	0.88	0.84	0.69	0.17	0.09	0.44	0.12	0.04
d, Delay for Lane Group [s/veh]	33.82	33.97	33.88	33.27	46.59	45.21	61.50	13.95	13.37	52.48	13.28	12.62
Lane Group LOS	C	C	C	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.91	3.27	2.82	0.64	10.60	9.49	1.77	2.22	1.12	1.07	1.55	0.42
50th-Percentile Queue Length [ft/ln]	47.68	81.63	70.38	15.98	265.10	237.24	44.30	55.59	27.95	26.79	38.64	10.46
95th-Percentile Queue Length [veh/ln]	3.43	5.88	5.07	1.15	15.94	14.54	3.19	4.00	2.01	1.93	2.78	0.75
95th-Percentile Queue Length [ft/ln]	85.83	146.93	126.68	28.77	398.62	363.54	79.74	100.06	50.30	48.23	69.56	18.83

**Movement, Approach, & Intersection Results**

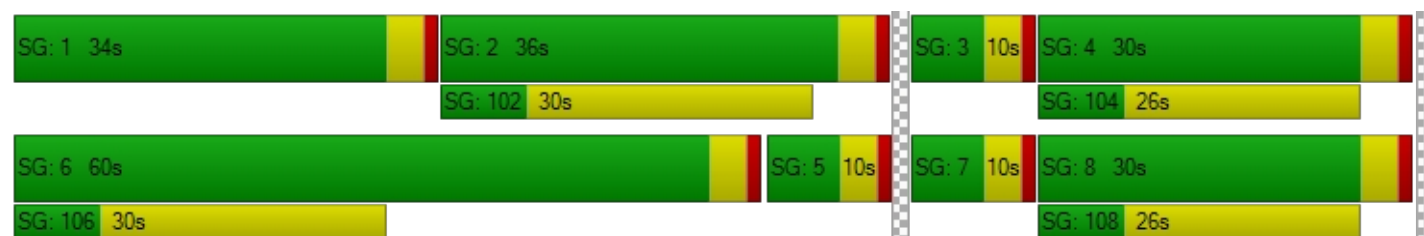
d_M, Delay for Movement [s/veh]	33.82	33.97	33.88	33.27	46.02	45.21	61.50	13.95	13.37	52.48	13.28	12.62
Movement LOS	C	C	C	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	33.92			45.44			19.46			21.70		
Approach LOS	C			D			B			C		
d_I, Intersection Delay [s/veh]	32.71											
Intersection LOS	C											
Intersection V/C	0.380											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.678			2.534			2.701			2.730		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			1018			473			473		
d_b, Bicycle Delay [s]	27.65			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	1.982			2.188			1.958			1.853		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	6.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.368

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	31	846	25	24	1038	31	22	44	26	51	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	846	25	24	1038	31	22	44	26	51	39	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	212	6	6	260	8	6	11	7	13	10	4
Total Analysis Volume [veh/h]	31	846	25	24	1038	31	22	44	26	51	39	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	77	0	0	77	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.02	0.24	0.23	0.01	0.29	0.29	0.05	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1466	1637	1551	1491	1637	1551	159	70	118
d1, Uniform Delay [s]	1.07	1.38	1.38	1.07	1.49	1.48	50.52	49.33	49.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.42	0.43	0.02	0.56	0.58	3.30	13.67	2.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.27	0.27	0.02	0.34	0.33	0.58	0.73	0.45
d, Delay for Lane Group [s/veh]	1.10	1.80	1.81	1.09	2.04	2.06	53.82	63.00	52.03
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.05	0.98	0.93	0.04	1.30	1.22	2.63	1.61	1.49
50th-Percentile Queue Length [ft/ln]	1.33	24.49	23.13	1.02	32.44	30.61	65.81	40.27	37.18
95th-Percentile Queue Length [veh/ln]	0.10	1.76	1.67	0.07	2.34	2.20	4.74	2.90	2.68
95th-Percentile Queue Length [ft/ln]	2.39	44.08	41.64	1.84	58.39	55.10	118.45	72.48	66.92

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.10	1.80	1.81	1.09	2.05	2.06	53.82	53.82	53.82	63.00	52.03	52.03
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	1.78			2.03			53.82			57.41		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	6.73											
Intersection LOS	A											
Intersection V/C	0.368											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.775			2.726			1.863			2.048		
Crosswalk LOS	C			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1327			1327			527			527		
d_b, Bicycle Delay [s]	6.22			6.22			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.304			2.461			1.711			1.731		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.284

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	62	535	39	35	722	39	28	27	45	49	20	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	535	39	35	722	39	28	27	45	49	20	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	134	10	9	181	10	7	7	11	12	5	7
Total Analysis Volume [veh/h]	62	535	39	35	722	39	28	27	45	49	20	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	85	0	0	85	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	94	94	94	94	94	94	8	8
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.15	0.02	0.21	0.20	0.06	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1487	1626	1541	1508	1626	1541	170	178
d1, Uniform Delay [s]	1.18	1.35	1.35	1.16	1.44	1.43	50.16	50.04
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.25	0.25	0.03	0.35	0.36	3.20	2.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.18	0.18	0.02	0.24	0.24	0.59	0.54
d, Delay for Lane Group [s/veh]	1.23	1.60	1.60	1.19	1.79	1.80	53.36	52.58
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.65	0.60	0.07	0.91	0.85	2.85	2.71
50th-Percentile Queue Length [ft/ln]	2.97	16.15	15.05	1.65	22.79	21.31	71.22	67.72
95th-Percentile Queue Length [veh/ln]	0.21	1.16	1.08	0.12	1.64	1.53	5.13	4.88
95th-Percentile Queue Length [ft/ln]	5.35	29.07	27.10	2.96	41.03	38.36	128.19	121.89

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.23	1.60	1.60	1.19	1.79	1.80	53.36	53.36	53.36	52.58	52.58	52.58
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.56			1.77			53.36			52.58		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.85											
Intersection LOS	A											
Intersection V/C	0.284											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.662			2.620			1.920			1.870		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	382			382			1473			1473		
d_b, Bicycle Delay [s]	36.00			36.00			3.82			3.82		
I_b,int, Bicycle LOS Score for Intersection	2.084			2.216			1.725			1.718		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:  
Analysis Method:  
Analysis Period:

Signalized  
HCM 6th Edition  
15 minutes

Delay (sec / veh): 37.0  
Level Of Service: D  
Volume to Capacity (v/c): 0.562

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	133	737	125	122	1044	127	145	306	137	207	492	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	737	125	122	1044	127	145	306	137	207	492	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	184	31	31	261	32	36	77	34	52	123	37
Total Analysis Volume [veh/h]	133	737	125	122	1044	127	145	306	137	207	492	146
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	49	0	12	51	0	12	39	0	10	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	25	25	13	32	32	11	42	42	15	45	45
g / C, Green / Cycle	0.05	0.23	0.23	0.12	0.29	0.29	0.10	0.38	0.38	0.13	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.07	0.03	0.25	0.12	0.08	0.05	0.08	0.12	0.09	0.08
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	194	857	406	414	1096	519	177	2152	680	240	2350	742
d1, Uniform Delay [s]	51.07	40.96	35.48	44.34	37.23	31.66	48.65	22.54	23.08	46.74	20.81	20.70
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.27	2.67	0.43	0.39	2.31	0.53	8.85	0.14	0.67	8.94	0.20	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.86	0.31	0.29	0.87	0.42	0.82	0.14	0.20	0.86	0.21	0.20
d, Delay for Lane Group [s/veh]	55.33	43.63	35.90	44.73	39.54	32.19	57.51	22.67	23.75	55.68	21.02	21.29
Lane Group LOS	E	D	D	D	D	C	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.91	9.83	2.84	1.54	12.39	4.70	4.33	1.77	2.52	6.12	2.75	2.52
50th-Percentile Queue Length [ft/ln]	47.81	245.64	71.04	38.61	309.86	117.45	108.21	44.14	62.92	152.99	68.68	62.88
95th-Percentile Queue Length [veh/ln]	3.44	14.97	5.12	2.78	18.17	8.25	7.74	3.18	4.53	10.18	4.95	4.53
95th-Percentile Queue Length [ft/ln]	86.06	374.16	127.88	69.50	454.21	206.32	193.51	79.45	113.26	254.41	123.63	113.19

**Movement, Approach, & Intersection Results**

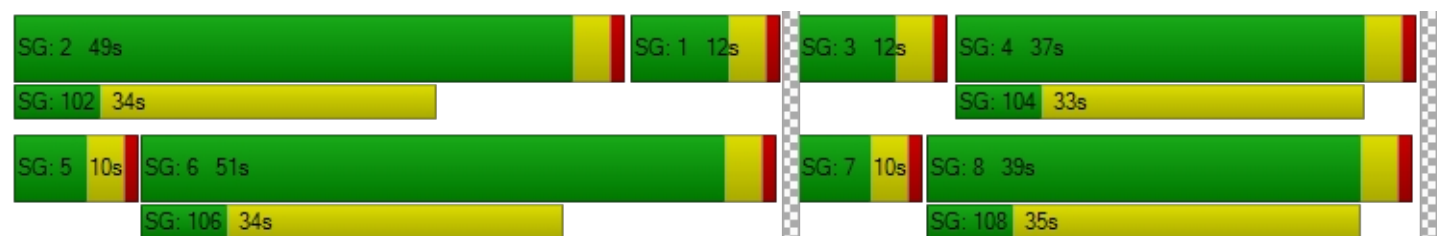
d_M, Delay for Movement [s/veh]	55.33	43.63	35.90	44.73	38.91	32.19	57.51	22.67	23.75	55.68	21.02	21.29
Movement LOS	E	D	D	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	44.22			38.80			31.51			29.56		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	37.00											
Intersection LOS	D											
Intersection V/C	0.562											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.025			2.927			2.898			2.905		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	818			855			636			600		
d_b, Bicycle Delay [s]	19.20			18.04			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.380			2.271			1.883			2.024		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 21: Lemon Street at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.514

#### Intersection Setup

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	193	484	51	89	776	79	93	450	201	78	317	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	193	484	51	89	776	79	93	450	201	78	317	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	121	13	22	194	20	23	113	50	20	79	15
Total Analysis Volume [veh/h]	193	484	51	89	776	79	93	450	201	78	317	60
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	45	0	21	56	0	10	34	0	10	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	26	26	36	26	26	7	56	56	5	55	55
g / C, Green / Cycle	0.33	0.24	0.24	0.33	0.24	0.24	0.07	0.51	0.51	0.05	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.11	0.13	0.03	0.05	0.20	0.04	0.05	0.12	0.11	0.02	0.10	0.10
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	341	916	434	493	902	427	121	1944	921	176	940	890
d1, Uniform Delay [s]	27.75	36.34	32.64	26.06	40.22	33.48	50.51	14.90	14.79	50.78	15.69	15.62
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.48	0.47	0.12	0.17	2.54	0.21	9.76	0.28	0.55	1.74	0.51	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.57	0.53	0.12	0.18	0.86	0.18	0.77	0.23	0.22	0.44	0.21	0.20
d, Delay for Lane Group [s/veh]	29.23	36.82	32.76	26.24	42.76	33.68	60.27	15.18	15.33	52.52	16.20	16.13
Lane Group LOS	C	D	C	C	D	C	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.95	5.70	1.08	1.68	10.28	1.71	2.84	3.14	2.86	1.09	2.90	2.63
50th-Percentile Queue Length [ft/ln]	98.84	142.42	27.03	41.89	257.03	42.82	71.07	78.57	71.47	27.15	72.40	65.64
95th-Percentile Queue Length [veh/ln]	7.12	9.61	1.95	3.02	15.54	3.08	5.12	5.66	5.15	1.95	5.21	4.73
95th-Percentile Queue Length [ft/ln]	177.92	240.28	48.65	75.40	388.49	77.08	127.92	141.43	128.65	48.87	130.31	118.16

**Movement, Approach, & Intersection Results**

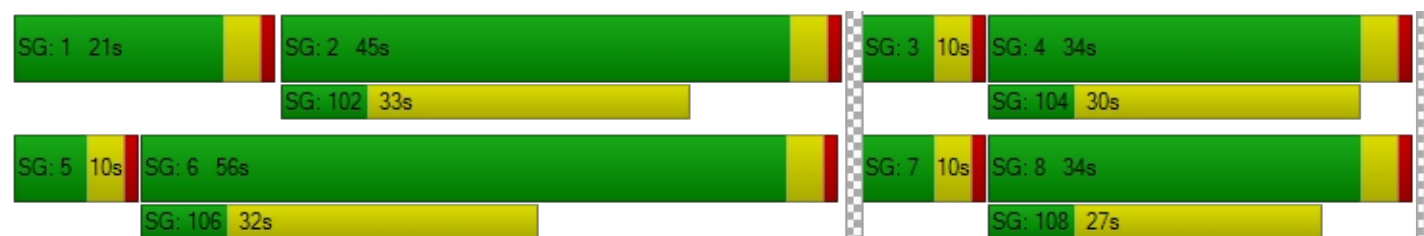
d_M, Delay for Movement [s/veh]	29.23	36.82	32.76	26.24	42.76	33.68	60.27	15.18	15.33	52.52	16.17	16.13
Movement LOS	C	D	C	C	D	C	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	34.52			40.44			20.86			22.40		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.01											
Intersection LOS	C											
Intersection V/C	0.514											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.752			2.719			2.749			2.782		
Crosswalk LOS	C			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			945			545			545		
d_b, Bicycle Delay [s]	21.64			15.29			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.160			2.338			1.969			1.935		
Bicycle LOS	B			B			A			A		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	114	859	0	0	991	558	0	0	0	147	368	228
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	859	0	0	991	558	0	0	0	147	368	228
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	215	0	0	248	140	0	0	0	37	92	57
Total Analysis Volume [veh/h]	114	859	0	0	991	558	0	0	0	147	368	228
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	38	0	0	28	0	0	0	0	0	62	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	76	66	66		16	16	16
g / C, Green / Cycle	0.06	0.76	0.66	0.66		0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.15	0.26	0.31		0.08	0.10	0.13
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	204	4332	2514	1191		288	608	288
d1, Uniform Delay [s]	45.82	3.39	7.75	8.30		38.42	39.06	40.40
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.37	0.10	0.47	1.33		1.40	0.98	4.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.20	0.39	0.47		0.51	0.61	0.79
d, Delay for Lane Group [s/veh]	48.19	3.49	8.21	9.63		39.82	40.04	45.27
Lane Group LOS	D	A	A	A		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.44	1.32	4.52	5.70		3.39	4.25	5.73
50th-Percentile Queue Length [ft/ln]	35.98	32.90	113.01	142.41		84.64	106.22	143.23
95th-Percentile Queue Length [veh/ln]	2.59	2.37	8.01	9.61		6.09	7.63	9.65
95th-Percentile Queue Length [ft/ln]	64.76	59.22	200.19	240.26		152.35	190.74	241.37

**Movement, Approach, & Intersection Results**

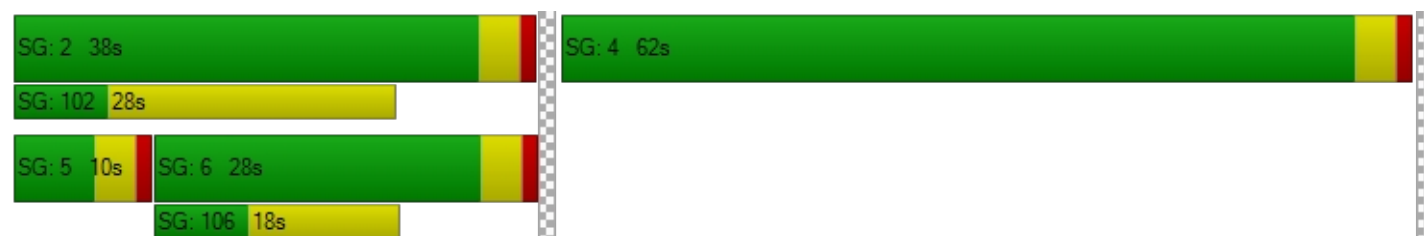
d_M, Delay for Movement [s/veh]	48.19	3.49	0.00	0.00	8.21	9.63	0.00	0.00	0.00	39.82	40.04	45.27
Movement LOS	D	A			A	A				D	D	D
d_A, Approach Delay [s/veh]	8.73			8.72			0.00			41.60		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	16.21											
Intersection LOS	B											
Intersection V/C	0.533											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.227			2.317		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	680			480			0			1160		
d_b, Bicycle Delay [s]	21.78			28.88			50.00			8.82		
I_b,int, Bicycle LOS Score for Intersection	2.095			2.412			4.132			2.173		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.570

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	48	370	0	0	841	328	0	0	0	109	359	466
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	370	0	0	841	328	0	0	0	109	359	466
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	93	0	0	210	82	0	0	0	27	90	117
Total Analysis Volume [veh/h]	48	370	0	0	841	328	0	0	0	109	359	466
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	13	53	0	0	40	0	0	0	0	0	47	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	4	63	54	54		29	29	29
g / C, Green / Cycle	0.04	0.63	0.54	0.54		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.21	0.22		0.13	0.12	0.26
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	81	3583	2065	978		525	554	525
d1, Uniform Delay [s]	46.84	7.38	13.11	13.31		28.90	28.60	33.88
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.17
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	6.64	0.06	0.53	1.21		0.61	0.51	7.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.10	0.38	0.40		0.45	0.42	0.89
d, Delay for Lane Group [s/veh]	53.48	7.43	13.64	14.52		29.50	29.10	41.76
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.32	1.00	4.95	5.20		4.65	4.52	11.71
50th-Percentile Queue Length [ft/ln]	32.91	24.99	123.70	129.90		116.30	112.91	292.82
95th-Percentile Queue Length [veh/ln]	2.37	1.80	8.60	8.93		8.19	8.00	17.33
95th-Percentile Queue Length [ft/ln]	59.25	44.98	214.90	223.36		204.74	200.05	433.14

**Movement, Approach, & Intersection Results**

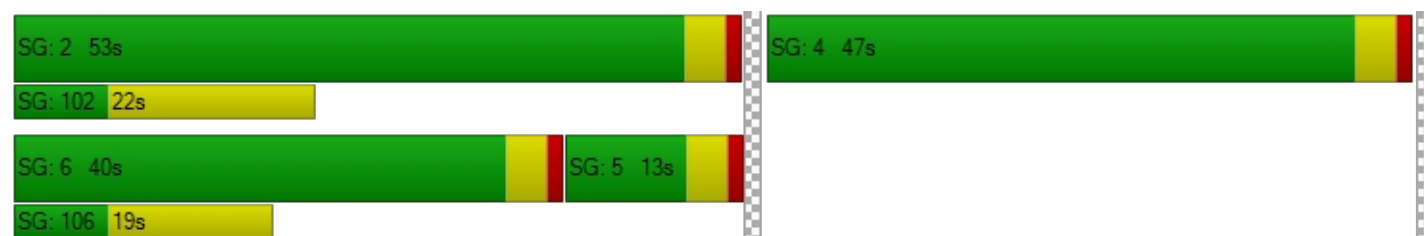
d_M, Delay for Movement [s/veh]	53.48	7.43	0.00	0.00	13.71	14.52	0.00	0.00	0.00	29.50	29.24	41.76
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	12.72			13.93			0.00			35.52		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	21.73											
Intersection LOS	C											
Intersection V/C	0.570											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.078			2.249		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	980			720			0			860		
d_b, Bicycle Delay [s]	13.01			20.48			50.00			16.25		
I_b,int, Bicycle LOS Score for Intersection	1.790			2.203			4.132			2.330		
Bicycle LOS	A			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.360

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	543	172	312	785	0	461	146	146	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	543	172	312	785	0	461	146	146	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	136	43	78	196	0	115	37	37	0	0	0
Total Analysis Volume [veh/h]	0	543	172	312	785	0	461	146	146	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	51	80	0	0	20	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	61	61	12	77	15	15	15	
g / C, Green / Cycle	0.61	0.61	0.12	0.77	0.15	0.15	0.15	
(v / s)_i Volume / Saturation Flow Rate	0.10	0.10	0.09	0.14	0.13	0.08	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3488	1102	405	4376	533	289	274	
d1, Uniform Delay [s]	8.32	8.32	42.93	3.13	41.38	38.92	39.10	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.10	0.30	3.13	0.09	4.35	1.36	1.60	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.16	0.16	0.77	0.18	0.86	0.50	0.53	
d, Delay for Lane Group [s/veh]	8.42	8.63	46.06	3.22	45.74	40.28	40.71	
Lane Group LOS	A	A	D	A	D	D	D	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.61	1.59	3.89	1.12	5.81	3.38	3.41	
50th-Percentile Queue Length [ft/ln]	40.20	39.80	97.25	27.96	145.22	84.45	85.15	
95th-Percentile Queue Length [veh/ln]	2.89	2.87	7.00	2.01	9.76	6.08	6.13	
95th-Percentile Queue Length [ft/ln]	72.37	71.64	175.05	50.32	244.04	152.01	153.27	

**Movement, Approach, & Intersection Results**

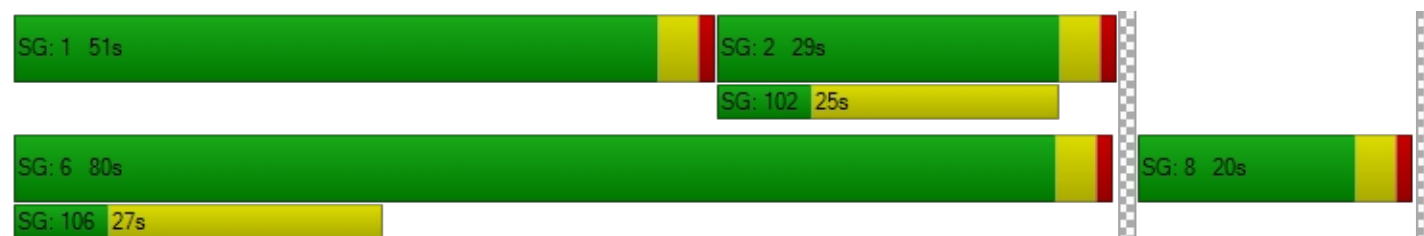
d_M, Delay for Movement [s/veh]	0.00	8.42	8.63	46.06	3.22	0.00	45.74	40.28	40.71	0.00	0.00	0.00
Movement LOS		A	A	D	A		D	D	D			
d_A, Approach Delay [s/veh]	8.47			15.40			43.70			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	21.78											
Intersection LOS	C											
Intersection V/C	0.360											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.319			2.027		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1520			320			0		
d_b, Bicycle Delay [s]	28.13			2.88			35.28			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.953			2.163			2.802			4.132		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.457

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	297	185	441	517	0	130	486	38	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	297	185	441	517	0	130	486	38	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	74	46	110	129	0	33	122	10	0	0	0
Total Analysis Volume [veh/h]	0	297	185	441	517	0	130	486	38	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	35	0	22	57	0	0	43	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	15	72	20	20	20	
g / C, Green / Cycle	0.53	0.53	0.15	0.72	0.20	0.20	0.20	
(v / s)_i Volume / Saturation Flow Rate	0.08	0.10	0.13	0.14	0.17	0.16	0.02	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	2013	954	519	2729	363	384	363	
d1, Uniform Delay [s]	11.99	12.32	41.51	4.60	38.51	37.93	32.54	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.15	0.45	4.01	0.15	5.86	3.76	0.12	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.15	0.19	0.85	0.19	0.86	0.79	0.10	
d, Delay for Lane Group [s/veh]	12.14	12.77	45.51	4.75	44.38	41.69	32.66	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.68	2.22	5.53	1.54	7.85	7.40	0.76	
50th-Percentile Queue Length [ft/ln]	42.04	55.43	138.29	38.45	196.33	184.96	19.03	
95th-Percentile Queue Length [veh/ln]	3.03	3.99	9.39	2.77	12.45	11.86	1.37	
95th-Percentile Queue Length [ft/ln]	75.67	99.78	234.71	69.21	311.23	296.48	34.26	

**Movement, Approach, & Intersection Results**

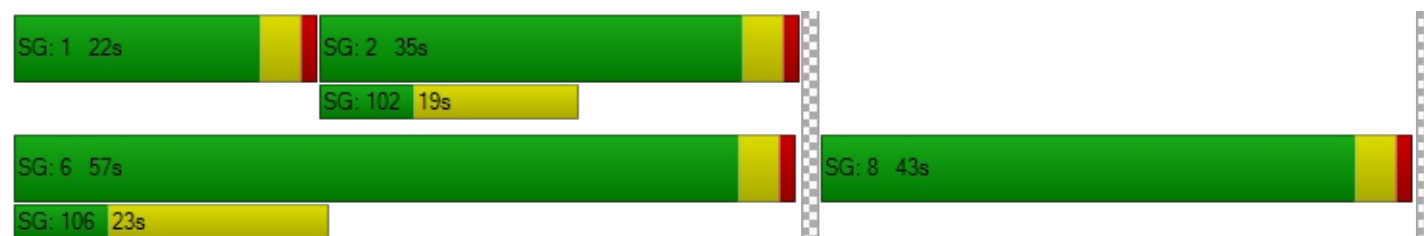
d_M, Delay for Movement [s/veh]	0.00	12.14	12.77	45.51	4.75	0.00	44.38	42.69	32.66	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	12.39			23.52			42.44			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	26.87											
Intersection LOS	C											
Intersection V/C	0.457											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.158			2.262		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	620			1060			780			0		
d_b, Bicycle Delay [s]	23.81			11.05			18.61			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.825			2.350			2.099			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.351

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	249	332	24	0	361
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	249	332	24	0	361
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	62	83	6	0	90
Total Analysis Volume [veh/h]	0	249	332	24	0	361
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.35	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	12.79	0.00	0.00	7.99	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.58	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	39.46	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.79		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.30					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	541.9
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.433

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	93	3	7	117	0	31	1	48	118	0	8
Total Analysis Volume [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	34	0	10	44	0	0	66	0	66	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	80	80	88	88	14	14	14	14
g / C, Green / Cycle	0.73	0.73	0.80	0.80	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.10	0.11	0.01	0.12	0.07	0.11	0.26	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1388	1315	1460	3028	277	268	92	235
d1, Uniform Delay [s]	4.45	4.48	2.31	2.59	44.63	46.57	43.82	42.35
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.23	0.00	0.11	1.11	3.65	1864.17	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.15	0.02	0.15	0.44	0.72	5.13	0.14
d, Delay for Lane Group [s/veh]	4.66	4.71	2.31	2.70	45.74	50.22	1907.99	42.62
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.22	1.23	0.09	0.93	3.22	5.40	50.04	0.81
50th-Percentile Queue Length [ft/ln]	30.55	30.86	2.23	23.23	80.39	134.90	1250.98	20.36
95th-Percentile Queue Length [veh/ln]	2.20	2.22	0.16	1.67	5.79	9.21	78.87	1.47
95th-Percentile Queue Length [ft/ln]	54.98	55.54	4.01	41.81	144.70	230.15	1971.69	36.66

**Movement, Approach, & Intersection Results**

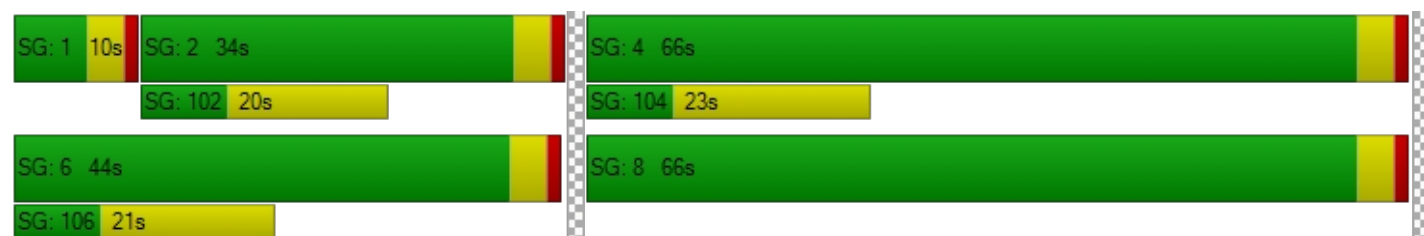
d_M, Delay for Movement [s/veh]	0.00	4.68	4.71	2.31	2.70	0.00	45.74	50.22	50.22	1907.99	0.00	42.62
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	4.69			2.68			48.47			1786.34		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	541.91											
Intersection LOS	F											
Intersection V/C	0.433											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.684			1.878			2.155		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			727			1127			0		
d_b, Bicycle Delay [s]	29.09			22.27			10.47			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.877			1.968			2.081			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	44.9
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.290

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	49	172	441	0	161	382
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	172	441	0	161	382
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	43	110	0	40	96
Total Analysis Volume [veh/h]	49	172	441	0	161	382
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.29	0.62
d_M, Delay for Movement [s/veh]	8.36	0.00	0.00	0.00	44.92	44.27
Movement LOS	A	A	A	A	E	E
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	11.30	11.30
95th-Percentile Queue Length [ft/ln]	3.43	0.00	0.00	0.00	282.60	282.60
d_A, Approach Delay [s/veh]	1.85		0.00		44.46	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	20.38					
Intersection LOS	E					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	56.7
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	40	216	827	0	0	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	216	827	0	0	330
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	54	207	0	0	83
Total Analysis Volume [veh/h]	40	216	827	0	0	330
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.01	0.00	0.00	0.89
d_M, Delay for Movement [s/veh]	9.71	0.00	0.00	0.00	56.36	56.69
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.16	0.00	0.00	0.00	8.83	8.83
95th-Percentile Queue Length [ft/ln]	3.92	0.00	0.00	0.00	220.76	220.76
d_A, Approach Delay [s/veh]	1.52		0.00		56.69	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	13.52					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	226	11	40	1117	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	226	11	40	1117	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	3	10	279	4	7
Total Analysis Volume [veh/h]	226	11	40	1117	17	27
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.01	0.07	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.79	0.00	19.76	10.34
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.09	0.00	0.33	0.33
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.32	0.00	8.18	8.18
d_A, Approach Delay [s/veh]	0.00		0.27		13.98	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.64					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.314

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	75	374	35	0	366	21	0	0	125	0	0	252
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	374	35	0	366	21	0	0	125	0	0	252
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	94	9	0	92	5	0	0	31	0	0	63
Total Analysis Volume [veh/h]	75	374	35	0	366	21	0	0	125	0	0	252
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.31
d_M, Delay for Movement [s/veh]	8.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.21	0.00	0.00	11.53
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	1.35
95th-Percentile Queue Length [ft/ln]	5.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.50	0.00	0.00	33.69
d_A, Approach Delay [s/veh]	1.29			0.00			10.21			11.53		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	3.85											
Intersection LOS	B											

*APPENDIX N-V*

**EXISTING PLUS PROJECT WITH IMPROVEMENTS  
FRIDAY DEPARTURE PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.283

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	51	38	5	35	9	3	37	31	46	44	13
Total Analysis Volume [veh/h]	276	204	151	18	141	37	11	147	125	184	175	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	48	48	48	9	9	9	9	9	9
g / C, Green / Cycle	0.74	0.74	0.74	0.74	0.74	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.12	0.15	0.08	0.01	0.10	0.01	0.08	0.07	0.10	0.06	0.06
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1300	1390	1322	1267	1322	234	271	257	209	271	257
d1, Uniform Delay [s]	2.61	2.69	2.50	2.32	2.55	24.05	25.91	25.69	26.63	25.50	25.41
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.30	0.18	0.02	0.21	0.08	1.69	1.43	11.44	1.11	1.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.19	0.11	0.01	0.13	0.05	0.54	0.49	0.88	0.44	0.41
d, Delay for Lane Group [s/veh]	2.89	2.99	2.68	2.34	2.76	24.14	27.60	27.12	38.06	26.61	26.48
Lane Group LOS	A	A	A	A	A	C	C	C	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.57	0.70	0.38	0.04	0.45	0.15	2.14	1.80	3.25	1.68	1.50
50th-Percentile Queue Length [ft/ln]	14.21	17.40	9.39	1.04	11.27	3.63	53.47	44.95	81.27	42.01	37.62
95th-Percentile Queue Length [veh/ln]	1.02	1.25	0.68	0.07	0.81	0.26	3.85	3.24	5.85	3.02	2.71
95th-Percentile Queue Length [ft/ln]	25.57	31.31	16.90	1.87	20.28	6.53	96.25	80.92	146.29	75.61	67.72

**Movement, Approach, & Intersection Results**

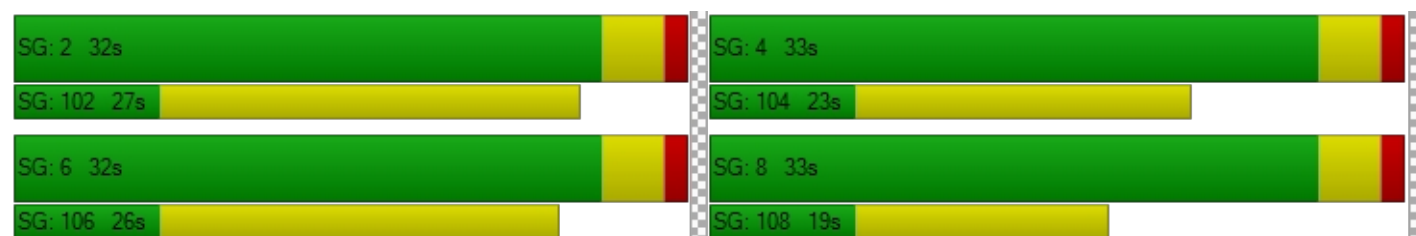
d_M, Delay for Movement [s/veh]	2.90	2.99	2.68	2.34	2.76	2.76	24.14	27.60	27.12	38.06	26.57	26.48
Movement LOS	A	A	A	A	A	A	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	2.88			2.72			27.25			31.73		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	15.17											
Intersection LOS	B											
Intersection V/C	0.283											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.638			2.088			2.856			2.315		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	862			862			892			892		
d_b, Bicycle Delay [s]	10.53			10.53			9.97			9.97		
I_b,int, Bicycle LOS Score for Intersection	2.601			1.883			2.027			1.897		
Bicycle LOS	B			A			B			A		

**Sequence**





Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	93	3	7	117	0	31	1	48	118	0	8
Total Analysis Volume [veh/h]	0	373	12	26	469	0	123	2	191	473	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	21	0	0	21	0	0	49	0	49	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	3	0	0	4	0	0	0	0	5	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No			No		No		
Maximum Recall		No			No			No		No		
Pedestrian Recall		No			No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	41	41	41	20	20	20	20
g / C, Green / Cycle	0.59	0.59	0.59	0.59	0.29	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.10	0.11	0.01	0.12	0.07	0.11	0.26	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1127	1068	928	2254	594	577	480	526
d1, Uniform Delay [s]	6.42	6.46	5.85	6.58	18.76	19.58	23.71	17.81
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.37	0.06	0.21	0.17	0.34	15.79	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.18	0.03	0.21	0.21	0.33	0.98	0.06
d, Delay for Lane Group [s/veh]	6.75	6.83	5.91	6.79	18.93	19.92	39.50	17.86
Lane Group LOS	A	A	A	A	B	B	D	B
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.17	1.19	0.15	1.40	1.46	2.40	9.07	0.37
50th-Percentile Queue Length [ft/ln]	29.37	29.71	3.66	35.10	36.55	60.05	226.86	9.31
95th-Percentile Queue Length [veh/ln]	2.11	2.14	0.26	2.53	2.63	4.32	14.01	0.67
95th-Percentile Queue Length [ft/ln]	52.86	53.48	6.59	63.19	65.79	108.09	350.37	16.75

**Movement, Approach, & Intersection Results**

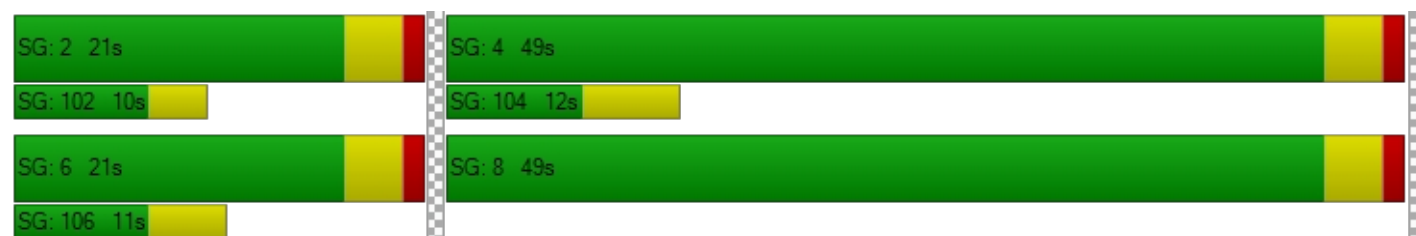
d_M, Delay for Movement [s/veh]	0.00	6.79	6.83	5.91	6.79	0.00	18.93	19.92	19.92	39.50	0.00	17.86
Movement LOS		A	A	A	A		B	B	B	D		B
d_A, Approach Delay [s/veh]	6.79			6.74			19.53			38.09		
Approach LOS	A			A			B			D		
d_I, Intersection Delay [s/veh]	18.45											
Intersection LOS	B											
Intersection V/C	0.436											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			24.86			24.86			24.86		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.661			1.855			2.141		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	486			486			1286			0		
d_b, Bicycle Delay [s]	20.06			20.06			4.46			35.00		
I_b,int, Bicycle LOS Score for Intersection	1.877			1.968			2.081			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**


Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	49	172	441	0	161	382
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	172	441	0	161	382
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	43	110	0	40	96
Total Analysis Volume [veh/h]	49	172	441	0	161	382
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	21
g / C, Green / Cycle	0.52	0.52	0.52	0.34
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.25	0.30
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	716	992	940	621
d1, Uniform Delay [s]	7.06	7.55	9.09	18.48
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.38	1.68	4.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.17	0.47	0.87
d, Delay for Lane Group [s/veh]	7.24	7.93	10.78	22.56
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.29	1.07	3.41	6.97
50th-Percentile Queue Length [ft/ln]	7.32	26.65	85.19	174.19
95th-Percentile Queue Length [veh/ln]	0.53	1.92	6.13	11.30
95th-Percentile Queue Length [ft/ln]	13.17	47.97	153.34	282.41

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	7.24	7.93	10.78	10.78	22.56	22.56
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	7.78		10.78		22.56	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	15.54					
Intersection LOS	B					
Intersection V/C	0.631					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.497	4.860	5.028
Bicycle LOS	E	E	F

**Sequence**




Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Signalized	Delay (sec / veh):	13.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	40	216	827	0	0	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	216	827	0	0	330
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	54	207	0	0	83
Total Analysis Volume [veh/h]	40	216	827	0	0	330
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	13
g / C, Green / Cycle	0.64	0.64	0.64	0.22
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.46	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	651	1221	1157	404
d1, Uniform Delay [s]	3.93	4.33	7.11	22.14
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.32	3.79	4.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.18	0.72	0.82
d, Delay for Lane Group [s/veh]	4.11	4.65	10.90	26.24
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.16	0.85	5.91	4.53
50th-Percentile Queue Length [ft/ln]	3.95	21.37	147.77	113.23
95th-Percentile Queue Length [veh/ln]	0.28	1.54	9.90	8.02
95th-Percentile Queue Length [ft/ln]	7.12	38.47	247.44	200.48

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	4.11	4.65	10.90	10.90	26.24	26.24
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	4.57		10.90		26.24	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	13.33					
Intersection LOS	B					
Intersection V/C	0.742					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.555	5.497	4.677
Bicycle LOS	E	F	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



## **APPENDIX O**

### **YEAR 2020 CUMULATIVE TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS (FRIDAY FIELD EVENT PROJECT ANALYSIS)**

*APPENDIX O-1*

**YEAR 2020 CUMULATIVE  
FRIDAY ARRIVAL PEAK HOUR**



**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	37.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	167	976	132	306	820	292	158	977	159	131	1023	318
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	167	976	132	306	820	292	158	977	159	131	1023	318
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	244	33	77	205	73	40	244	40	33	256	80
Total Analysis Volume [veh/h]	167	976	132	306	820	292	158	977	159	131	1023	318
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	13	43	0	13	45	0	10	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	51	51	9	53	53	9	28	28	6	25	25
g / C, Green / Cycle	0.07	0.46	0.46	0.08	0.48	0.48	0.08	0.25	0.25	0.05	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.17	0.07	0.09	0.20	0.19	0.09	0.20	0.21	0.04	0.18	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	230	2637	833	289	1821	863	148	968	459	192	1295	409
d1, Uniform Delay [s]	50.46	19.19	17.16	50.51	18.68	18.52	50.51	38.25	38.56	51.09	40.07	39.94
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.13	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.32	0.40	0.41	42.18	0.71	1.41	52.67	1.47	4.33	4.24	1.12	3.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	0.37	0.16	1.06	0.42	0.40	1.06	0.79	0.81	0.68	0.79	0.78
d, Delay for Lane Group [s/veh]	54.78	19.59	17.57	92.69	19.39	19.93	103.18	39.72	42.89	55.34	41.19	43.16
Lane Group LOS	D	B	B	F	B	B	F	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.39	5.41	2.02	5.65	6.39	5.97	6.25	9.69	9.91	1.88	8.76	8.38
50th-Percentile Queue Length [ft/ln]	59.76	135.16	50.51	141.30	159.71	149.35	156.16	242.36	247.84	47.09	218.88	209.47
95th-Percentile Queue Length [veh/ln]	4.30	9.22	3.64	9.74	10.53	9.98	10.57	14.80	15.08	3.39	13.61	13.13
95th-Percentile Queue Length [ft/ln]	107.57	230.50	90.92	243.50	263.34	249.57	264.19	370.02	376.94	84.77	340.20	328.14

**Movement, Approach, & Intersection Results**

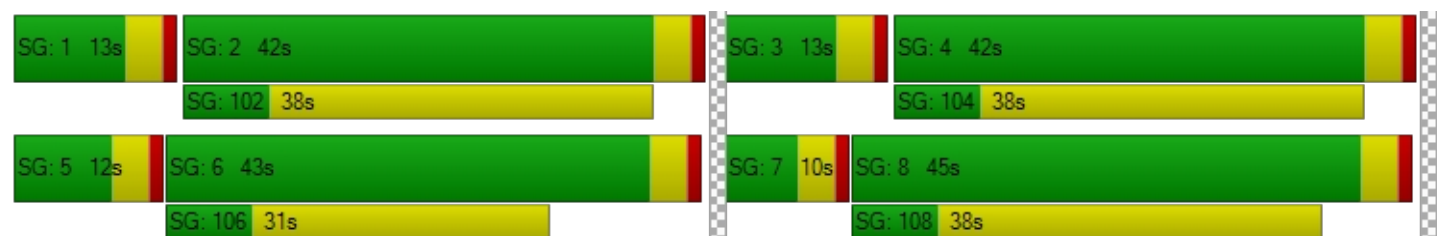
d_M, Delay for Movement [s/veh]	54.78	19.59	17.57	92.69	19.42	19.93	103.18	40.41	42.89	55.34	41.19	43.16
Movement LOS	D	B	B	F	B	B	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.99			35.34			48.38			42.88		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	37.81											
Intersection LOS	D											
Intersection V/C	0.615											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.117			3.085			2.990			3.172		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			745			691		
d_b, Bicycle Delay [s]	23.56			22.91			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.261			2.340			2.271			2.369		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	27.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	28	1101	639	94	959	28	77	128	29	530	76	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1101	639	94	959	28	77	128	29	530	76	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	275	160	24	240	7	19	32	7	133	19	0
Total Analysis Volume [veh/h]	28	1101	639	94	959	28	77	128	29	530	76	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	55	7	59	59	10	10	10	22	22
g / C, Green / Cycle	0.03	0.50	0.07	0.54	0.54	0.09	0.09	0.09	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.05	0.21	0.11	0.04	0.07	0.02	0.17	0.17
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	58	2865	120	2040	966	161	170	161	353	353
d1, Uniform Delay [s]	52.36	16.88	50.59	14.92	13.22	47.70	48.96	46.41	42.73	42.83
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.00	0.39	10.54	0.56	0.46	2.21	6.65	0.53	5.90	6.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.38	0.78	0.39	0.20	0.48	0.75	0.18	0.85	0.86
d, Delay for Lane Group [s/veh]	58.36	17.27	61.13	15.49	13.69	49.91	55.61	46.94	48.63	49.14
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	5.70	2.90	5.80	2.55	2.11	3.74	0.76	8.43	8.58
50th-Percentile Queue Length [ft/ln]	21.42	142.38	72.41	145.01	63.84	52.67	93.50	18.99	210.76	214.45
95th-Percentile Queue Length [veh/ln]	1.54	9.61	5.21	9.75	4.60	3.79	6.73	1.37	13.19	13.38
95th-Percentile Queue Length [ft/ln]	38.56	240.22	130.33	243.76	114.91	94.81	168.29	34.18	329.81	334.53

**Movement, Approach, & Intersection Results**

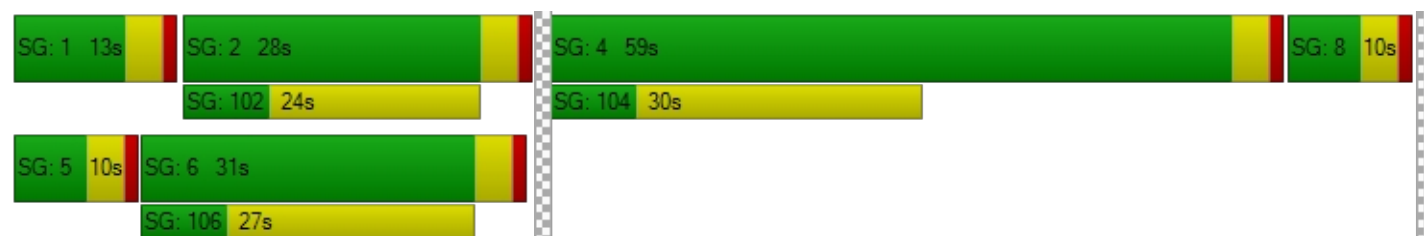
d_M, Delay for Movement [s/veh]	58.36	17.27	0.00	61.13	15.18	13.69	49.91	55.61	46.94	48.85	49.14	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	18.29			19.13			52.66			48.88		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.30											
Intersection LOS	C											
Intersection V/C	0.564											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.918			2.230			2.219		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.181			2.154			1.946			2.560		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.711

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	75	1308	32	266	1141	17	37	113	83	57	135	400
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	1308	32	266	1141	17	37	113	83	57	135	400
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	327	8	67	285	4	9	28	21	14	34	100
Total Analysis Volume [veh/h]	75	1308	32	266	1141	17	37	113	83	57	135	400
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	29	57	0	16	44	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	63	63	12	69	69	23	23	23	23	23	39
g / C, Green / Cycle	0.05	0.57	0.57	0.11	0.62	0.62	0.21	0.21	0.21	0.21	0.21	0.36
(v / s)_i Volume / Saturation Flow Rate	0.04	0.36	0.36	0.08	0.30	0.01	0.02	0.06	0.05	0.03	0.07	0.22
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	100	1081	1024	387	2370	1123	304	402	381	323	402	645
d1, Uniform Delay [s]	51.18	16.06	15.99	47.08	11.12	7.85	34.88	36.32	35.81	35.28	36.78	29.09
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.31
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.77	2.90	3.00	2.19	0.70	0.02	0.18	0.38	0.28	0.26	0.49	2.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.64	0.63	0.69	0.48	0.02	0.12	0.28	0.22	0.18	0.34	0.62
d, Delay for Lane Group [s/veh]	61.95	18.95	18.99	49.26	11.82	7.88	35.06	36.70	36.10	35.54	37.26	31.90
Lane Group LOS	E	B	B	D	B	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.33	12.03	11.31	3.62	7.25	0.16	0.81	2.59	1.87	1.27	3.13	9.10
50th-Percentile Queue Length [ft/ln]	58.31	300.64	282.71	90.41	181.24	3.89	20.37	64.66	46.82	31.74	78.30	227.51
95th-Percentile Queue Length [veh/ln]	4.20	17.71	16.82	6.51	11.67	0.28	1.47	4.66	3.37	2.29	5.64	14.05
95th-Percentile Queue Length [ft/ln]	104.96	442.82	420.58	162.74	291.63	6.99	36.67	116.39	84.27	57.14	140.95	351.19

**Movement, Approach, & Intersection Results**

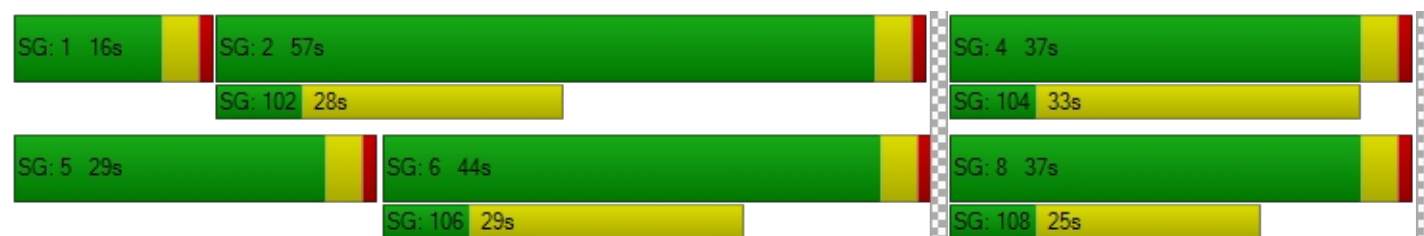
d_M, Delay for Movement [s/veh]	61.95	18.97	18.99	49.26	11.82	7.88	35.06	36.70	36.10	35.54	37.26	31.90
Movement LOS	E	B	B	D	B	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	21.25			18.77			36.23			33.48		
Approach LOS	C			B			D			C		
d_I, Intersection Delay [s/veh]	23.21											
Intersection LOS	C											
Intersection V/C	0.711											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.916			3.097			2.253			2.505		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			727			600			600		
d_b, Bicycle Delay [s]	14.77			22.27			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.727			2.734			1.944			2.536		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	51.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.467

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	236	277	82	63	249	23	106	211	10	120	312	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	236	277	82	63	249	23	106	211	10	120	312	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	69	21	16	62	6	27	53	3	30	78	18
Total Analysis Volume [veh/h]	236	277	82	63	249	23	106	211	10	120	312	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	46	46	0	46	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	42	42	42	42	42	15	15	60	15	15	15
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.13	0.13	0.55	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.13	0.15	0.05	0.04	0.15	0.06	0.11	0.01	0.07	0.11	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	683	683	683	683	683	101	251	986	91	251	238
d1, Uniform Delay [s]	24.36	25.02	22.18	21.94	24.94	43.83	46.53	11.29	43.57	46.26	45.99
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.39	1.79	0.36	0.27	1.74	54.82	7.35	0.02	157.85	5.81	4.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.35	0.41	0.12	0.09	0.40	1.05	0.84	0.01	1.32	0.80	0.76
d, Delay for Lane Group [s/veh]	25.75	26.81	22.54	22.20	26.67	98.64	53.88	11.31	201.43	52.06	50.93
Lane Group LOS	C	C	C	C	C	F	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	4.63	5.60	1.45	1.10	5.48	4.07	6.12	0.11	6.27	5.72	5.08
50th-Percentile Queue Length [ft/ln]	115.67	139.97	36.21	27.49	136.93	101.77	153.01	2.87	156.78	142.91	127.02
95th-Percentile Queue Length [veh/ln]	8.15	9.48	2.61	1.98	9.32	7.33	10.18	0.21	11.29	9.64	8.78
95th-Percentile Queue Length [ft/ln]	203.86	236.99	65.18	49.49	232.88	183.19	254.44	5.17	282.20	240.93	219.43

**Movement, Approach, & Intersection Results**

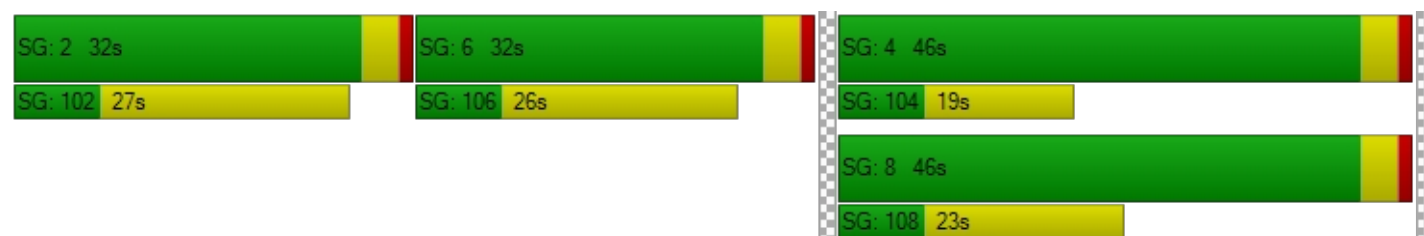
d_M, Delay for Movement [s/veh]	25.75	26.81	22.54	22.20	26.67	26.67	98.64	53.88	11.31	201.43	51.66	50.93
Movement LOS	C	C	C	C	C	C	F	D	B	F	D	D
d_A, Approach Delay [s/veh]	25.80			25.83			67.09			87.36		
Approach LOS	C			C			E			F		
d_I, Intersection Delay [s/veh]	51.05											
Intersection LOS	D											
Intersection V/C	0.467											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.549			2.357			2.485			2.350		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			764			764		
d_b, Bicycle Delay [s]	30.56			30.56			21.02			21.02		
I_b,int, Bicycle LOS Score for Intersection	2.541			2.112			2.099			1.974		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








### Intersection Level Of Service Report

#### Intersection 5: Hornet Way at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.317

#### Intersection Setup

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

#### Volumes

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	177	137	185	372	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	177	137	185	372	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	44	34	46	93	7
Total Analysis Volume [veh/h]	17	177	137	185	372	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	72	0	0	38	38	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	89	89	89	89
g / C, Green / Cycle	0.12	0.12	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.08	0.10	0.20	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	213	213	1392	1537	1537	1456
d1, Uniform Delay [s]	43.10	47.35	2.17	2.22	2.49	2.04
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.13	0.14	0.16	0.37	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.83	0.10	0.12	0.24	0.02
d, Delay for Lane Group [s/veh]	43.26	55.48	2.31	2.38	2.87	2.06
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.42	5.20	0.49	0.67	1.53	0.10
50th-Percentile Queue Length [ft/ln]	10.54	129.96	12.32	16.85	38.17	2.43
95th-Percentile Queue Length [veh/ln]	0.76	8.94	0.89	1.21	2.75	0.18
95th-Percentile Queue Length [ft/ln]	18.98	223.44	22.18	30.34	68.70	4.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	43.26	55.48	2.31	2.38	2.87	2.06
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	54.41		2.35		2.81	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	13.57					
Intersection LOS	B					
Intersection V/C	0.317					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.262	2.233	2.146
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.664	4.794
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 72s

SG: 101 26s

SG: 4 38s


SG: 104 21s

SG: 8 38s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	222	1226	112	130	888	23	42	506	169	180	769	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	222	1226	112	130	888	23	42	506	169	180	769	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	307	28	33	222	6	11	127	42	45	192	46
Total Analysis Volume [veh/h]	222	1226	112	130	888	23	42	506	169	180	769	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	61	51	51	61	51	51	41	31	31	41	33	33
g / C, Green / Cycle	0.55	0.46	0.46	0.55	0.46	0.46	0.38	0.28	0.28	0.38	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.12	0.37	0.36	0.07	0.25	0.25	0.02	0.19	0.17	0.10	0.27	0.25
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	756	874	828	514	872	826	319	541	513	474	570	540
d1, Uniform Delay [s]	12.67	25.28	25.00	11.98	21.40	21.34	21.90	34.75	34.10	23.77	36.77	35.91
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.99	7.33	7.12	0.26	2.38	2.47	0.18	1.42	1.19	0.50	4.91	3.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.29	0.79	0.78	0.25	0.54	0.53	0.13	0.67	0.61	0.38	0.89	0.83
d, Delay for Lane Group [s/veh]	13.66	32.61	32.13	12.23	23.79	23.80	22.09	36.17	35.29	24.27	41.68	39.26
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.95	16.62	15.28	1.55	9.08	8.52	0.71	8.67	7.39	3.30	13.54	11.53
50th-Percentile Queue Length [ft/ln]	73.74	415.59	382.03	38.85	227.00	213.11	17.82	216.79	184.85	82.62	338.49	288.29
95th-Percentile Queue Length [veh/ln]	5.31	23.31	21.69	2.80	14.02	13.31	1.28	13.50	11.85	5.95	19.57	17.10
95th-Percentile Queue Length [ft/ln]	132.73	582.75	542.30	69.93	350.55	332.82	32.07	337.52	296.33	148.71	489.35	427.52

**Movement, Approach, & Intersection Results**

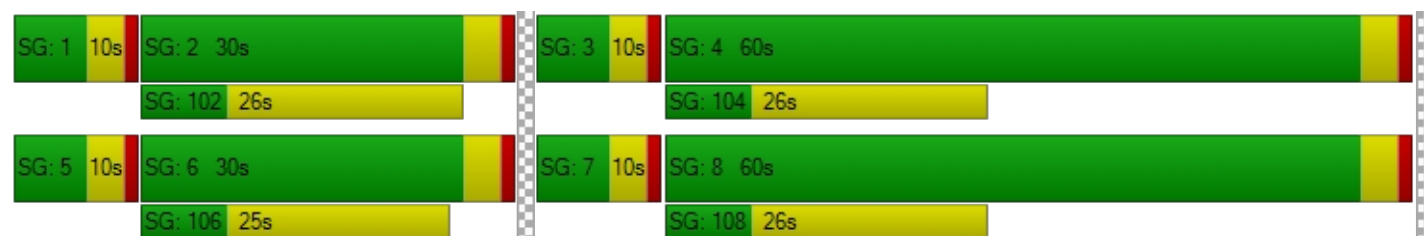
d_M, Delay for Movement [s/veh]	13.66	32.40	32.13	12.23	23.79	23.80	22.09	35.92	35.29	24.27	40.85	39.26
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	29.71			22.35			34.96			37.96		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	30.94											
Intersection LOS	C											
Intersection V/C	0.801											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.932			2.815			2.798			2.765		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.847			2.418			2.151			2.494		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-









**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.765

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	125	1003	99	135	915	143	221	584	147	194	858	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	1003	99	135	915	143	221	584	147	194	858	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	251	25	34	229	36	55	146	37	49	215	46
Total Analysis Volume [veh/h]	125	1003	99	135	915	143	221	584	147	194	858	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	31	0	10	31	0	10	59	0	10	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	63	53	53	63	53	53	39	29	29	39	29	29
g / C, Green / Cycle	0.57	0.48	0.48	0.57	0.48	0.48	0.36	0.27	0.27	0.36	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.29	0.08	0.29	0.28	0.12	0.20	0.19	0.11	0.23	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	721	911	863	702	911	863	357	505	478	403	1009	478
d1, Uniform Delay [s]	10.93	21.40	21.12	11.00	21.07	20.68	25.93	37.33	36.67	25.49	38.35	33.07
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	3.31	3.23	0.13	3.03	2.86	1.75	2.52	2.02	0.89	2.12	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.63	0.61	0.19	0.61	0.58	0.62	0.77	0.72	0.48	0.85	0.38
d, Delay for Lane Group [s/veh]	11.46	24.71	24.35	11.13	24.11	23.54	27.67	39.85	38.69	26.39	40.47	33.58
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.48	11.54	10.48	1.52	10.97	9.74	4.40	9.92	8.54	3.75	11.14	4.08
50th-Percentile Queue Length [ft/ln]	37.01	288.50	262.10	38.00	274.28	243.55	110.04	247.98	213.55	93.74	278.59	101.98
95th-Percentile Queue Length [veh/ln]	2.66	17.11	15.79	2.74	16.40	14.86	7.84	15.08	13.34	6.75	16.62	7.34
95th-Percentile Queue Length [ft/ln]	66.61	427.78	394.85	68.41	410.09	371.53	196.06	377.10	333.39	168.72	415.46	183.57

**Movement, Approach, & Intersection Results**

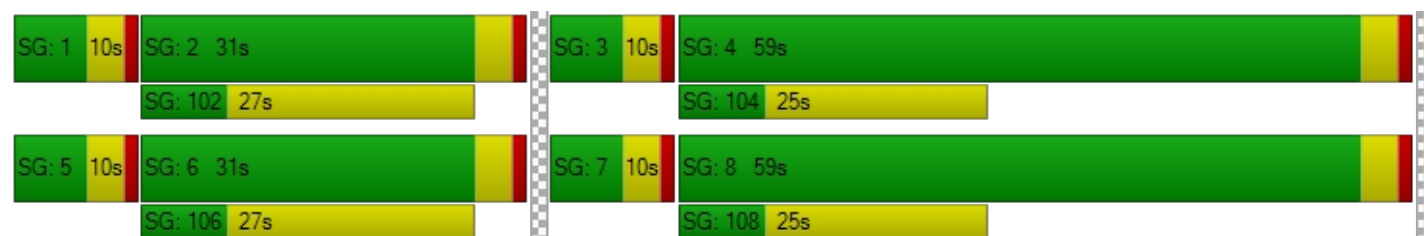
d_M, Delay for Movement [s/veh]	11.46	24.55	24.35	11.13	23.88	23.54	27.67	39.46	38.69	26.39	40.47	33.58
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	23.20			22.40			36.61			37.24		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	29.53											
Intersection LOS	C											
Intersection V/C	0.765											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.872			2.906			2.803			2.892		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1000			1000		
d_b, Bicycle Delay [s]	31.31			31.31			13.75			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.572			2.544			2.345			2.579		
Bicycle LOS	B			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	115	504	87	49	384	88	112	553	131	150	1002	103
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	504	87	49	384	88	112	553	131	150	1002	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	126	22	12	96	22	28	138	33	38	251	26
Total Analysis Volume [veh/h]	115	504	87	49	384	88	112	553	131	150	1002	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	32	0	10	30	0	17	57	0	11	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	48	48	56	47	47	9	35	35	7	33	33
g / C, Green / Cycle	0.51	0.43	0.43	0.51	0.42	0.42	0.08	0.32	0.32	0.06	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.05	0.03	0.13	0.12	0.06	0.19	0.18	0.04	0.26	0.06
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	854	1644	779	854	802	760	141	605	573	212	1142	541
d1, Uniform Delay [s]	13.99	20.43	18.62	13.46	21.15	20.99	49.88	31.63	31.15	50.76	36.58	28.57
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.48	0.29	0.03	1.01	0.98	9.72	0.96	0.86	4.29	2.34	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.31	0.11	0.06	0.31	0.29	0.80	0.60	0.56	0.71	0.88	0.19
d, Delay for Lane Group [s/veh]	14.32	20.92	18.91	13.49	22.16	21.97	59.60	32.59	32.02	55.05	38.91	28.74
Lane Group LOS	B	C	B	B	C	C	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.55	4.30	1.38	0.61	4.44	3.97	3.40	8.22	7.16	2.15	12.96	2.05
50th-Percentile Queue Length [ft/ln]	38.83	107.57	34.55	15.29	111.10	99.23	85.06	205.38	179.09	53.79	324.04	51.18
95th-Percentile Queue Length [veh/ln]	2.80	7.70	2.49	1.10	7.90	7.14	6.12	12.92	11.55	3.87	18.87	3.68
95th-Percentile Queue Length [ft/ln]	69.89	192.61	62.19	27.52	197.53	178.62	153.11	322.90	288.82	96.82	471.65	92.12

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	14.32	20.92	18.91	13.49	22.09	21.97	59.60	32.39	32.02	55.05	38.91	28.74
Movement LOS	B	C	B	B	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	19.60			21.26			36.16			40.01		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	31.70											
Intersection LOS	C											
Intersection V/C	0.576											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.685			2.551			2.772			2.906		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			473			964			855		
d_b, Bicycle Delay [s]	30.56			32.07			14.77			18.04		
I_b,int, Bicycle LOS Score for Intersection	2.142			1.989			2.216			2.595		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	8	18	14	210	12	38	26	630	5	17	1163	314
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	18	14	210	12	38	26	630	5	17	1163	314
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	5	4	53	3	10	7	158	1	4	291	79
Total Analysis Volume [veh/h]	8	18	14	210	12	38	26	630	5	17	1163	314
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	10	18	84	84	84	77	77	90
g / C, Green / Cycle	0.04	0.04	0.04	0.09	0.17	0.76	0.76	0.76	0.70	0.70	0.82
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.06	0.03	0.01	0.17	0.17	0.01	0.31	0.17
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	67	74	70	316	298	1210	1447	1371	1183	2640	1479
d1, Uniform Delay [s]	51.05	51.30	51.22	48.43	39.39	3.17	3.78	3.78	5.18	7.39	2.12
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.77	1.68	1.38	2.39	0.26	0.01	0.36	0.38	0.02	0.54	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.24	0.20	0.66	0.17	0.02	0.23	0.23	0.01	0.44	0.21
d, Delay for Lane Group [s/veh]	51.82	52.98	52.59	50.82	39.65	3.18	4.14	4.16	5.20	7.92	2.19
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.23	0.52	0.40	2.89	1.19	0.12	1.88	1.78	0.12	5.58	1.00
50th-Percentile Queue Length [ft/ln]	5.69	12.90	10.02	72.22	29.63	2.95	46.90	44.49	2.94	139.46	25.02
95th-Percentile Queue Length [veh/ln]	0.41	0.93	0.72	5.20	2.13	0.21	3.38	3.20	0.21	9.45	1.80
95th-Percentile Queue Length [ft/ln]	10.23	23.22	18.03	129.99	53.34	5.32	84.42	80.08	5.29	236.30	45.04

**Movement, Approach, & Intersection Results**

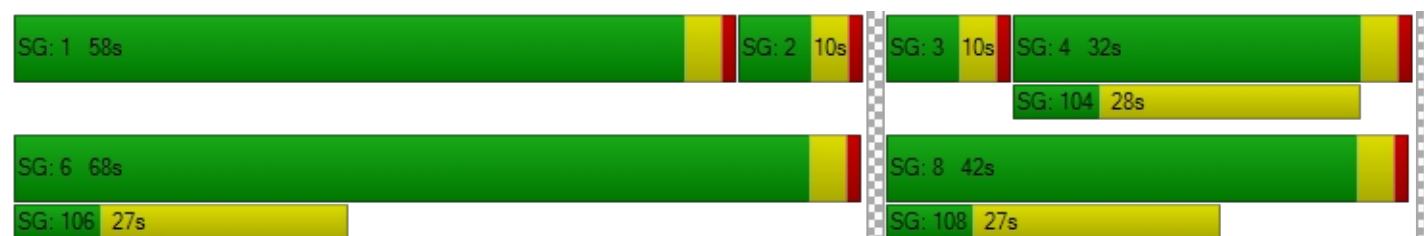
d_M, Delay for Movement [s/veh]	51.82	52.98	52.59	50.82	39.65	39.65	3.18	4.15	4.16	5.20	7.92	2.19
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.61			48.67			4.11			6.69		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	11.19											
Intersection LOS	B											
Intersection V/C	0.426											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.183			2.318			2.685			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			1.989			2.105			2.792		
Bicycle LOS	A			A			B			C		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	22.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	291	184	184	64	116	46	59	707	123	123	1184	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	291	184	184	64	116	46	59	707	123	123	1184	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	46	46	16	29	12	15	177	31	31	296	21
Total Analysis Volume [veh/h]	291	184	184	64	116	46	59	707	123	123	1184	82
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	46	0	19	46	0	10	35	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	26	17	17	26	7	7	76	66	66	76	67	67
g / C, Green / Cycle	0.24	0.16	0.16	0.24	0.07	0.07	0.69	0.60	0.60	0.69	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.16	0.10	0.10	0.04	0.04	0.04	0.03	0.23	0.22	0.07	0.35	0.34
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	456	296	280	369	127	120	939	1135	1075	1104	1149	1089
d1, Uniform Delay [s]	37.96	43.46	43.72	32.99	50.19	50.09	5.55	11.60	11.42	5.77	13.13	13.00
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	2.14	2.61	0.22	5.97	5.60	0.03	0.99	0.96	0.20	2.06	2.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.64	0.62	0.66	0.17	0.67	0.64	0.06	0.39	0.37	0.11	0.57	0.56
d, Delay for Lane Group [s/veh]	39.44	45.60	46.33	33.21	56.16	55.70	5.58	12.59	12.38	5.97	15.19	15.08
Lane Group LOS	D	D	D	C	E	E	A	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.26	4.85	4.90	1.37	2.49	2.25	0.41	5.65	5.01	0.94	9.85	9.09
50th-Percentile Queue Length [ft/ln]	181.50	121.18	122.57	34.36	62.26	56.34	10.32	141.32	125.24	23.52	246.21	227.14
95th-Percentile Queue Length [veh/ln]	11.68	8.46	8.53	2.47	4.48	4.06	0.74	9.55	8.68	1.69	14.99	14.03
95th-Percentile Queue Length [ft/ln]	291.97	211.45	213.35	61.86	112.07	101.41	18.58	238.80	217.01	42.33	374.87	350.73

**Movement, Approach, & Intersection Results**

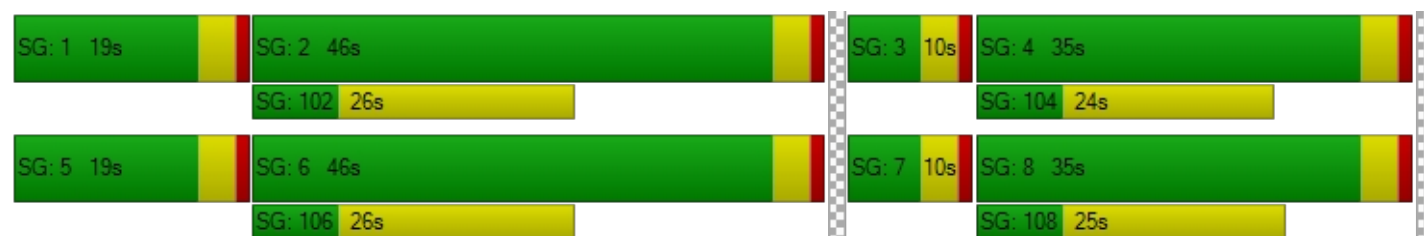
d_M, Delay for Movement [s/veh]	39.44	45.60	46.33	33.21	56.04	55.70	5.58	12.51	12.38	5.97	15.14	15.08
Movement LOS	D	D	D	C	E	E	A	B	B	A	B	B
d_A, Approach Delay [s/veh]	43.08			49.51			12.03			14.33		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	22.19											
Intersection LOS	C											
Intersection V/C	0.644											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.616			2.327			2.814			2.782		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			764			564			564		
d_b, Bicycle Delay [s]	21.02			21.02			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.647			1.746			2.293			2.706		
Bicycle LOS	B			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 11: Acacia Avenue at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.453

#### Intersection Setup

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	90	66	79	34	46	35	30	838	36	74	1249	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	66	79	34	46	35	30	838	36	74	1249	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	17	20	9	12	9	8	210	9	19	312	12
Total Analysis Volume [veh/h]	90	66	79	34	46	35	30	838	36	74	1249	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	16	31	0	10	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	85	85	85	87	87	87
g / C, Green / Cycle	0.07	0.07	0.07	0.07	0.07	0.78	0.78	0.78	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.05	0.02	0.24	0.23	0.04	0.35	0.35
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	77	127	120	96	120	1183	1473	1395	1390	1503	1424
d1, Uniform Delay [s]	50.02	49.61	50.08	48.80	50.14	2.83	3.65	3.63	2.50	3.70	3.68
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	102.72	3.25	5.92	2.23	6.35	0.04	0.54	0.56	0.07	0.96	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.17	0.52	0.66	0.36	0.67	0.03	0.31	0.30	0.05	0.45	0.44
d, Delay for Lane Group [s/veh]	152.74	52.86	56.00	51.04	56.49	2.87	4.19	4.19	2.57	4.66	4.67
Lane Group LOS	F	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.25	1.87	2.32	0.95	2.39	0.13	2.57	2.40	0.30	3.99	3.73
50th-Percentile Queue Length [ft/ln]	106.35	46.72	57.94	23.71	59.70	3.35	64.29	60.00	7.40	99.70	93.33
95th-Percentile Queue Length [veh/ln]	7.66	3.36	4.17	1.71	4.30	0.24	4.63	4.32	0.53	7.18	6.72
95th-Percentile Queue Length [ft/ln]	191.42	84.09	104.30	42.67	107.47	6.02	115.72	108.01	13.31	179.47	168.00

**Movement, Approach, & Intersection Results**

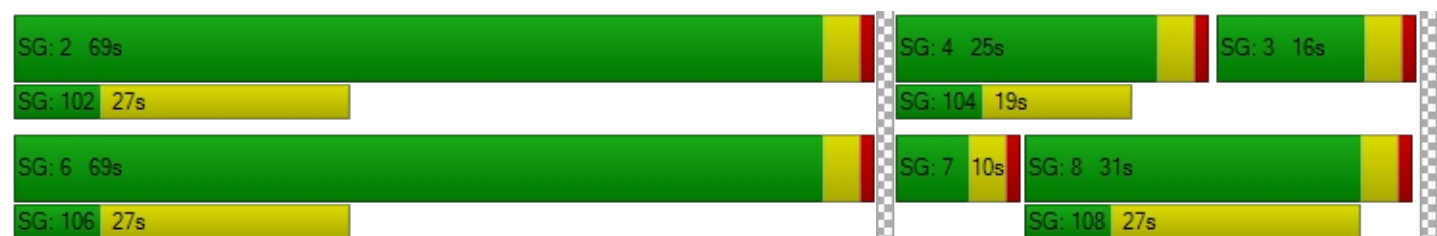
d_M, Delay for Movement [s/veh]	152.74	52.86	56.00	51.04	56.49	56.49	2.87	4.19	4.19	2.57	4.67	4.67
Movement LOS	F	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	92.17			54.88			4.15			4.55		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	14.46											
Intersection LOS	B											
Intersection V/C	0.453											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.312			2.073			2.882			2.811		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			382		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			36.00		
I_b,int, Bicycle LOS Score for Intersection	1.947			1.749			2.305			2.691		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	187	551	102	192	579	371	299	592	97	176	963	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	187	551	102	192	579	371	299	592	97	176	963	159
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	138	26	48	145	93	75	148	24	44	241	40
Total Analysis Volume [veh/h]	187	551	102	192	579	371	299	592	97	176	963	159
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	34	0	20	37	37	15	34	0	22	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	44	44	8	39	54	11	30	30	13	31	31
g / C, Green / Cycle	0.12	0.40	0.40	0.08	0.35	0.49	0.10	0.27	0.27	0.12	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.10	0.15	0.06	0.05	0.15	0.21	0.09	0.16	0.05	0.10	0.25	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	215	1501	711	266	1336	880	354	1017	482	210	1075	509
d1, Uniform Delay [s]	47.71	23.60	21.39	49.79	27.33	18.12	48.68	35.01	31.24	47.68	37.95	31.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.27	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.44	0.69	0.42	3.71	1.03	0.81	5.53	0.53	0.20	8.69	2.93	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.87	0.37	0.14	0.72	0.43	0.42	0.84	0.58	0.20	0.84	0.90	0.31
d, Delay for Lane Group [s/veh]	58.15	24.29	21.81	53.50	28.36	18.93	54.20	35.54	31.44	56.37	40.88	31.43
Lane Group LOS	E	C	C	D	C	B	D	D	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.64	5.17	1.77	2.72	5.97	6.15	4.30	6.91	2.03	5.22	12.71	3.37
50th-Percentile Queue Length [ft/ln]	141.12	129.31	44.27	67.92	149.36	153.87	107.42	172.77	50.65	130.46	317.77	84.20
95th-Percentile Queue Length [veh/ln]	9.54	8.90	3.19	4.89	9.98	10.22	7.70	11.22	3.65	8.96	18.56	6.06
95th-Percentile Queue Length [ft/ln]	238.53	222.56	79.69	122.26	249.57	255.59	192.41	280.55	91.17	224.12	463.95	151.56

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	58.15	24.29	21.81	53.50	28.36	18.93	54.20	35.54	31.44	56.37	40.88	31.43
Movement LOS	E	C	C	D	C	B	D	D	C	E	D	C
d_A, Approach Delay [s/veh]	31.53			29.52			40.78			41.82		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.26											
Intersection LOS	D											
Intersection V/C	0.731											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.737			2.903			2.953			2.817		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			545			673		
d_b, Bicycle Delay [s]	29.09			26.95			29.09			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.253			2.502			2.375			2.630		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-






**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	90	0	184	0	760	345	302	1381	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	90	0	184	0	760	345	302	1381	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	46	0	190	86	76	345	0
Total Analysis Volume [veh/h]	0	0	0	90	0	184	0	760	345	302	1381	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	25	0	0	45	0	40	85	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		13	13	64	64	21	89
g / C, Green / Cycle		0.12	0.12	0.58	0.58	0.19	0.81
(v / s)_i Volume / Saturation Flow Rate		0.05	0.10	0.19	0.20	0.17	0.36
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		220	220	2206	1045	338	3059
d1, Uniform Delay [s]		44.59	47.19	12.00	12.16	43.56	3.28
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.22	8.12	0.41	0.93	8.15	0.48
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.41	0.84	0.33	0.35	0.89	0.45
d, Delay for Lane Group [s/veh]		45.81	55.31	12.41	13.09	51.71	3.77
Lane Group LOS		D	E	B	B	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.34	5.40	4.66	4.87	8.72	3.54
50th-Percentile Queue Length [ft/ln]		58.55	135.05	116.53	121.72	218.02	88.40
95th-Percentile Queue Length [veh/ln]		4.22	9.21	8.20	8.49	13.56	6.36
95th-Percentile Queue Length [ft/ln]		105.39	230.34	205.05	212.19	339.10	159.12

**Movement, Approach, & Intersection Results**

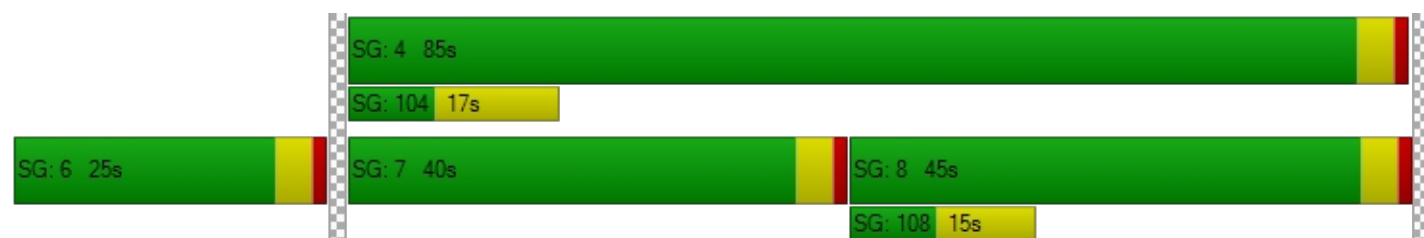
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	45.81	45.81	55.31	0.00	12.43	13.09	51.71	3.77	0.00
Movement LOS				D	D	E		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			52.19			12.64			12.37		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	16.03											
Intersection LOS	B											
Intersection V/C	0.533											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.064	1.858	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	382	745	1473
d_b, Bicycle Delay [s]	55.00	36.00	21.64	3.82
I_b,int, Bicycle LOS Score for Intersection	4.132	2.012	2.167	2.948
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	675	0	468	0	0	0	131	726	0	0	963	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	675	0	468	0	0	0	131	726	0	0	963	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	169	0	117	0	0	0	33	182	0	0	241	45
Total Analysis Volume [veh/h]	675	0	468	0	0	0	131	726	0	0	963	181
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	78	0	0	0	0	0	10	32	0	0	22	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	27	27		10	75	61	61
g / C, Green / Cycle	0.25	0.25	0.25		0.09	0.68	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.21		0.07	0.19	0.30	0.32
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	449	449	449		164	2575	1046	991
d1, Uniform Delay [s]	39.29	39.29	39.29		49.01	7.06	15.89	16.28
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.54	4.54	4.54		8.72	0.27	2.06	2.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.85	0.85		0.80	0.28	0.55	0.58
d, Delay for Lane Group [s/veh]	43.83	43.83	43.83		57.73	7.33	17.95	18.73
Lane Group LOS	D	D	D		E	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.25	10.25	10.25		3.91	3.22	9.47	9.77
50th-Percentile Queue Length [ft/ln]	256.32	256.32	256.32		97.83	80.57	236.84	244.20
95th-Percentile Queue Length [veh/ln]	15.50	15.50	15.50		7.04	5.80	14.52	14.89
95th-Percentile Queue Length [ft/ln]	387.60	387.60	387.60		176.10	145.03	363.04	372.34

**Movement, Approach, & Intersection Results**

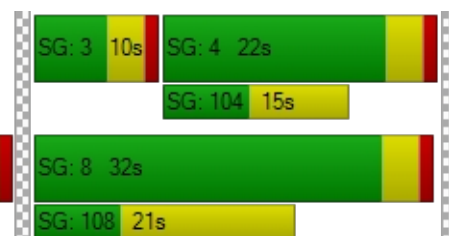
d_M, Delay for Movement [s/veh]	43.83	0.00	43.83	0.00	0.00	0.00	57.73	7.33	0.00	0.00	18.27	18.73
Movement LOS	D		D				E	A			B	B
d_A, Approach Delay [s/veh]	43.83			0.00			15.04			18.34		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	26.71											
Intersection LOS	C											
Intersection V/C	0.676											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.321	1.737	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	509	327
d_b, Bicycle Delay [s]	55.00	55.00	30.56	38.47
I_b,int, Bicycle LOS Score for Intersection	6.018	4.132	2.267	2.503
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.256

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	32	724	17	7	608	23	13	26	26	19	18	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	724	17	7	608	23	13	26	26	19	18	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	181	4	2	152	6	3	7	7	5	5	6
Total Analysis Volume [veh/h]	32	724	17	7	608	23	13	26	26	19	18	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.20	0.00	0.17	0.17	0.04	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1559	1671	1583	1549	1671	1583	125	129
d1, Uniform Delay [s]	0.81	1.00	1.00	0.80	0.96	0.96	51.70	51.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.32	0.33	0.01	0.26	0.27	3.29	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.23	0.23	0.00	0.20	0.19	0.52	0.46
d, Delay for Lane Group [s/veh]	0.84	1.32	1.33	0.81	1.23	1.23	54.99	54.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.04	0.53	0.50	0.01	0.43	0.41	1.88	1.72
50th-Percentile Queue Length [ft/ln]	0.91	13.19	12.56	0.20	10.83	10.27	47.04	42.98
95th-Percentile Queue Length [veh/ln]	0.07	0.95	0.90	0.01	0.78	0.74	3.39	3.09
95th-Percentile Queue Length [ft/ln]	1.63	23.74	22.61	0.35	19.49	18.49	84.68	77.37

**Movement, Approach, & Intersection Results**

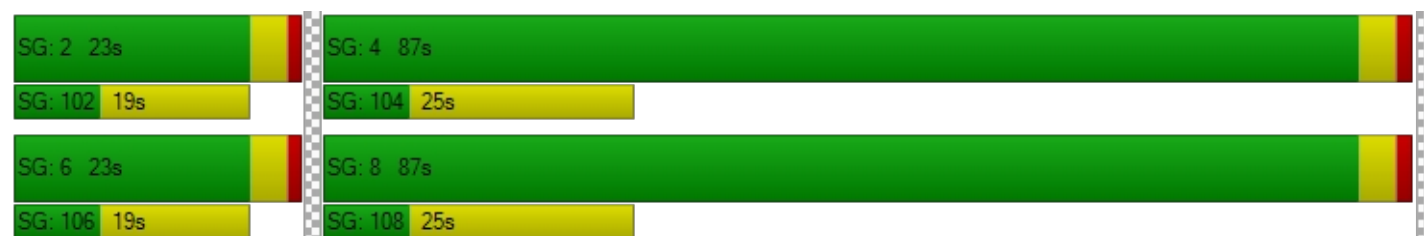
d_M, Delay for Movement [s/veh]	0.84	1.32	1.33	0.81	1.23	1.23	54.99	54.99	54.99	54.14	54.14	54.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.30			1.22			54.99			54.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.61											
Intersection LOS	A											
Intersection V/C	0.256											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.615			2.601			1.837			1.788		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.197			2.086			1.667			1.659		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	132	1024	188	88	985	111	152	442	140	209	540	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	1024	188	88	985	111	152	442	140	209	540	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	256	47	22	246	28	38	111	35	52	135	22
Total Analysis Volume [veh/h]	132	1024	188	88	985	111	152	442	140	209	540	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	39	0	28	57	0	11	33	0	10	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	47	37	37	47	37	37	55	42	42	55	44	44
g / C, Green / Cycle	0.42	0.34	0.34	0.42	0.33	0.33	0.50	0.38	0.38	0.50	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.07	0.27	0.10	0.05	0.30	0.29	0.08	0.12	0.08	0.12	0.14	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	345	1282	607	418	634	601	815	1435	680	849	1514	717
d1, Uniform Delay [s]	19.61	33.09	26.99	19.11	34.97	34.46	14.92	24.12	23.11	15.45	23.21	20.91
k, delay calibration	0.11	0.11	0.11	0.11	0.19	0.17	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.70	1.19	0.29	0.25	8.41	6.38	0.11	0.56	0.69	0.69	0.66	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.80	0.31	0.21	0.90	0.87	0.19	0.31	0.21	0.25	0.36	0.12
d, Delay for Lane Group [s/veh]	20.31	34.27	27.28	19.36	43.38	40.84	15.03	24.68	23.80	16.14	23.87	21.26
Lane Group LOS	C	C	C	B	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.16	12.39	3.70	1.39	15.81	13.98	2.07	4.14	2.57	3.08	5.01	1.47
50th-Percentile Queue Length [ft/ln]	54.01	309.76	92.41	34.72	395.20	349.45	51.78	103.48	64.37	76.93	125.17	36.63
95th-Percentile Queue Length [veh/ln]	3.89	18.16	6.65	2.50	22.33	20.11	3.73	7.45	4.63	5.54	8.68	2.64
95th-Percentile Queue Length [ft/ln]	97.22	454.08	166.33	62.49	558.21	502.73	93.20	186.27	115.86	138.48	216.92	65.93

**Movement, Approach, & Intersection Results**

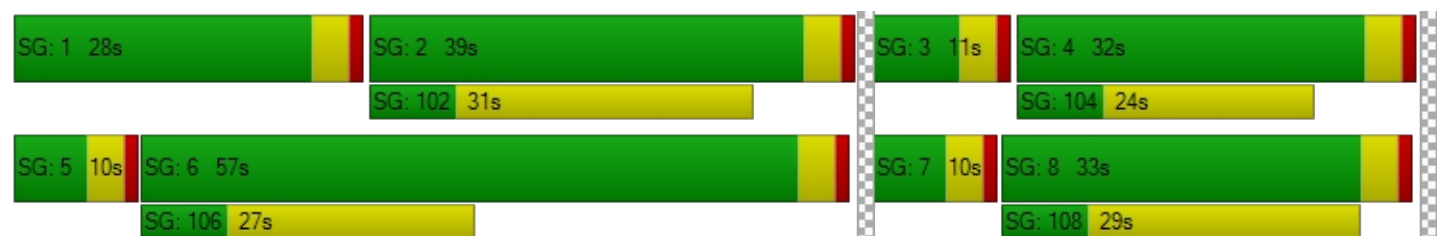
d_M, Delay for Movement [s/veh]	20.31	34.27	27.28	19.36	42.31	40.84	15.03	24.68	23.80	16.14	23.87	21.26
Movement LOS	C	C	C	B	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	31.92			40.47			22.51			21.67		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.62											
Intersection LOS	C											
Intersection V/C	0.632											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.016			2.877			2.775			2.759		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			964			527			509		
d_b, Bicycle Delay [s]	25.57			14.77			29.82			30.56		
I_b,int, Bicycle LOS Score for Intersection	2.668			2.536			2.165			2.248		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.540

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	150	646	237	47	577	71	101	519	111	235	685	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	646	237	47	577	71	101	519	111	235	685	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	162	59	12	144	18	25	130	28	59	171	16
Total Analysis Volume [veh/h]	150	646	237	47	577	71	101	519	111	235	685	65
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	34	0	36	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	23	23	23	8	56	56	10	57	57
g / C, Green / Cycle	0.22	0.22	0.22	0.21	0.21	0.21	0.07	0.50	0.50	0.09	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.08	0.17	0.13	0.03	0.18	0.17	0.06	0.14	0.06	0.07	0.18	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	230	830	393	208	392	371	131	1913	906	315	1980	938
d1, Uniform Delay [s]	36.67	40.50	38.72	35.63	42.22	41.90	50.16	15.72	14.46	48.86	15.41	13.10
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.12	1.61	1.49	0.55	5.80	4.94	9.29	0.35	0.28	3.50	0.48	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.65	0.78	0.60	0.23	0.86	0.83	0.77	0.27	0.12	0.75	0.35	0.07
d, Delay for Lane Group [s/veh]	39.79	42.12	40.20	36.18	48.03	46.84	59.45	16.07	14.74	52.36	15.89	13.25
Lane Group LOS	D	D	D	D	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.64	8.36	5.90	1.06	9.45	8.50	3.06	3.78	1.52	3.29	5.03	0.83
50th-Percentile Queue Length [ft/ln]	90.94	209.09	147.44	26.60	236.20	212.49	76.58	94.46	38.01	82.37	125.78	20.70
95th-Percentile Queue Length [veh/ln]	6.55	13.11	9.88	1.92	14.49	13.28	5.51	6.80	2.74	5.93	8.71	1.49
95th-Percentile Queue Length [ft/ln]	163.69	327.67	247.01	47.88	362.23	332.03	137.85	170.04	68.42	148.26	217.74	37.26

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	39.79	42.12	40.20	36.18	47.54	46.84	59.45	16.07	14.74	52.36	15.89	13.25
Movement LOS	D	D	D	D	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	41.34			46.70			21.86			24.42		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.45											
Intersection LOS	C											
Intersection V/C	0.540											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.780			2.603			2.821			2.862		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			1018			473			473		
d_b, Bicycle Delay [s]	29.09			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.412			2.133			2.163			2.372		
Bicycle LOS	B			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	66	1379	48	42	1234	42	47	73	74	78	129	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	1379	48	42	1234	42	47	73	74	78	129	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	345	12	11	309	11	12	18	19	20	32	7
Total Analysis Volume [veh/h]	66	1379	48	42	1234	42	47	73	74	78	129	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	62	0	0	62	0	0	48	0	0	48	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.39	0.38	0.02	0.35	0.34	0.11	0.04	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1272	1521	1441	1235	1521	1441	268	74	228
d1, Uniform Delay [s]	2.27	3.56	3.54	2.23	3.34	3.32	46.96	43.71	45.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	1.10	1.15	0.05	0.90	0.93	3.67	62.05	3.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.48	0.48	0.03	0.43	0.43	0.72	1.05	0.68
d, Delay for Lane Group [s/veh]	2.34	4.66	4.69	2.29	4.24	4.25	50.63	105.76	49.41
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.25	4.32	4.06	0.16	3.61	3.39	5.44	3.12	4.26
50th-Percentile Queue Length [ft/ln]	6.18	107.95	101.40	3.89	90.32	84.68	136.10	78.12	106.45
95th-Percentile Queue Length [veh/ln]	0.44	7.73	7.30	0.28	6.50	6.10	9.27	5.62	7.64
95th-Percentile Queue Length [ft/ln]	11.12	193.15	182.53	7.00	162.57	152.43	231.77	140.62	191.05

**Movement, Approach, & Intersection Results**

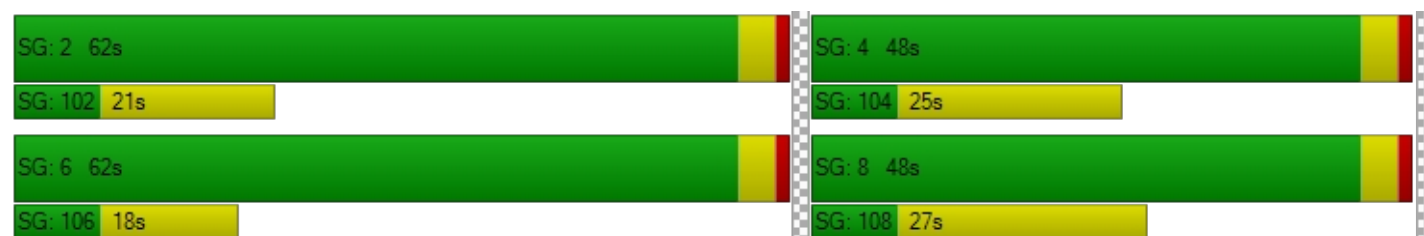
d_M, Delay for Movement [s/veh]	2.34	4.68	4.69	2.29	4.25	4.25	50.63	50.63	50.63	105.76	49.41	49.41
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.57			4.18			50.63			68.27		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.76											
Intersection LOS	B											
Intersection V/C	0.534											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.982			2.916			2.028			2.138		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1055			1055			800			800		
d_b, Bicycle Delay [s]	12.29			12.29			19.80			19.80		
I_b,int, Bicycle LOS Score for Intersection	2.791			2.647			1.880			1.944		
Bicycle LOS	C			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	123	903	77	59	804	75	81	44	142	100	43	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	903	77	59	804	75	81	44	142	100	43	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	226	19	15	201	19	20	11	36	25	11	19
Total Analysis Volume [veh/h]	123	903	77	59	804	75	81	44	142	100	43	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	47	0	0	47	0	0	63	0	0	63	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	83	83	83	83	83	83	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.07	0.27	0.26	0.03	0.24	0.23	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1246	1444	1368	1225	1444	1368	343	349
d1, Uniform Delay [s]	3.39	4.32	4.27	3.27	4.16	4.12	44.67	43.26
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.68	0.69	0.07	0.58	0.58	3.81	1.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.35	0.34	0.05	0.32	0.31	0.78	0.62
d, Delay for Lane Group [s/veh]	3.55	5.00	4.96	3.34	4.74	4.71	48.48	45.08
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.64	3.38	3.09	0.30	2.92	2.67	7.42	5.73
50th-Percentile Queue Length [ft/ln]	16.07	84.45	77.33	7.42	73.03	66.70	185.51	143.26
95th-Percentile Queue Length [veh/ln]	1.16	6.08	5.57	0.53	5.26	4.80	11.89	9.66
95th-Percentile Queue Length [ft/ln]	28.92	152.02	139.20	13.36	131.45	120.06	297.19	241.41

**Movement, Approach, & Intersection Results**

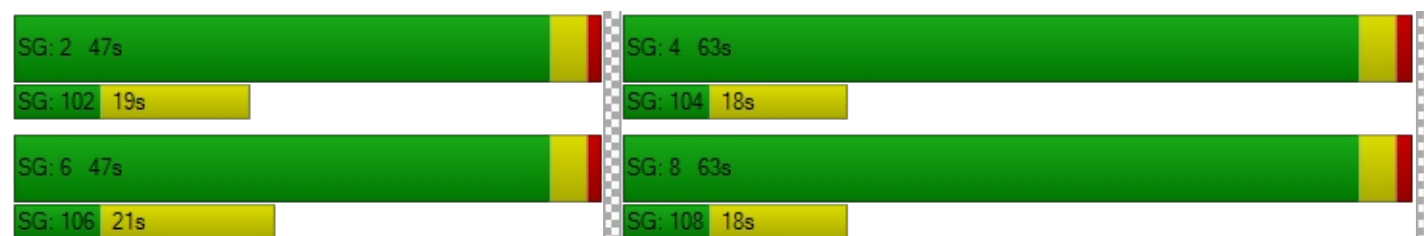
d_M, Delay for Movement [s/veh]	3.55	4.98	4.96	3.34	4.73	4.71	48.48	48.48	48.48	45.08	45.08	45.08
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	4.82			4.64			48.48			45.08		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.83											
Intersection LOS	B											
Intersection V/C	0.450											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.871			2.814			2.147			2.002		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	782			782			1073			1073		
d_b, Bicycle Delay [s]	20.40			20.40			11.82			11.82		
I_b,int, Bicycle LOS Score for Intersection	2.470			2.333			2.000			1.918		
Bicycle LOS	B			B			B			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	262	1299	289	203	1101	214	260	766	218	228	943	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	262	1299	289	203	1101	214	260	766	218	228	943	241
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	66	325	72	51	275	54	65	192	55	57	236	60
Total Analysis Volume [veh/h]	262	1299	289	203	1101	214	260	766	218	228	943	241
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	11	40	0	20	39	0	18	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	38	38	7	36	36	16	35	35	14	33	33
g / C, Green / Cycle	0.08	0.35	0.35	0.06	0.33	0.33	0.15	0.32	0.32	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.16	0.06	0.29	0.13	0.14	0.13	0.12	0.13	0.17	0.13
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	286	1312	621	223	1243	589	264	1807	571	232	1704	538
d1, Uniform Delay [s]	50.12	35.83	28.09	51.19	34.84	28.59	46.79	29.64	29.19	47.82	32.40	31.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.27	9.51	0.54	13.42	2.05	0.43	22.13	0.73	1.94	24.02	1.30	2.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.91	0.99	0.47	0.91	0.87	0.39	0.98	0.42	0.38	0.98	0.55	0.45
d, Delay for Lane Group [s/veh]	61.39	45.34	28.64	64.61	36.89	29.02	68.92	30.37	31.13	71.84	33.70	33.90
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.01	18.63	5.99	3.19	13.74	4.77	8.68	5.42	4.76	7.75	7.18	5.56
50th-Percentile Queue Length [ft/ln]	100.31	465.69	149.69	79.68	343.61	119.31	216.90	135.57	119.11	193.69	179.57	138.91
95th-Percentile Queue Length [veh/ln]	7.22	25.71	10.00	5.74	19.82	8.36	13.51	9.24	8.34	12.31	11.58	9.42
95th-Percentile Queue Length [ft/ln]	180.56	642.64	250.02	143.43	495.61	208.88	337.66	231.05	208.60	307.81	289.46	235.55

**Movement, Approach, & Intersection Results**

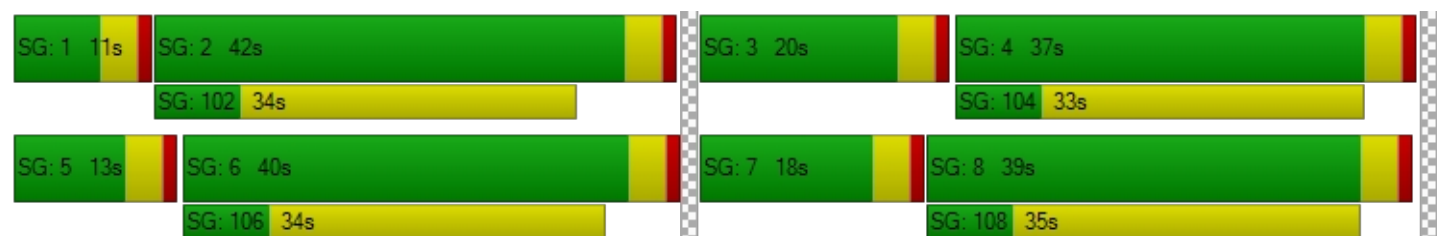
d_M, Delay for Movement [s/veh]	61.39	45.34	28.64	64.61	36.77	29.02	68.92	30.37	31.13	71.84	33.70	33.90
Movement LOS	E	D	C	E	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	45.00			39.40			38.56			39.89		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	41.06											
Intersection LOS	D											
Intersection V/C	0.831											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.149			3.066			3.060			3.060		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			655			636			600		
d_b, Bicycle Delay [s]	23.56			24.89			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.086			2.395			2.244			2.336		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	39.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.838

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	288	938	135	199	844	169	208	762	186	220	854	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	288	938	135	199	844	169	208	762	186	220	854	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	235	34	50	211	42	52	191	47	55	214	37
Total Analysis Volume [veh/h]	288	938	135	199	844	169	208	762	186	220	854	146
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	42	0	20	52	0	14	37	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	46	32	32	46	36	36	10	43	43	9	42	42
g / C, Green / Cycle	0.42	0.29	0.29	0.42	0.32	0.32	0.09	0.39	0.39	0.08	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.16	0.25	0.08	0.11	0.22	0.09	0.12	0.20	0.10	0.06	0.28	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	498	1089	516	425	1233	584	165	1486	704	293	728	690
d1, Uniform Delay [s]	22.33	37.19	30.29	21.09	32.29	27.72	50.01	25.54	22.77	49.31	28.95	28.43
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.06	2.14	0.27	0.80	0.68	0.27	128.52	1.27	0.92	3.85	6.13	5.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.58	0.86	0.26	0.47	0.68	0.29	1.26	0.51	0.26	0.75	0.72	0.69
d, Delay for Lane Group [s/veh]	23.40	39.34	30.55	21.90	32.97	27.99	178.53	26.81	23.69	53.16	35.08	33.95
Lane Group LOS	C	D	C	C	C	C	F	C	C	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.28	12.11	2.80	3.45	9.75	3.36	10.40	7.75	3.44	3.11	12.84	11.32
50th-Percentile Queue Length [ft/ln]	132.04	302.75	70.02	86.14	243.87	83.94	259.94	193.76	85.97	77.67	320.89	283.05
95th-Percentile Queue Length [veh/ln]	9.05	17.82	5.04	6.20	14.88	6.04	16.99	12.32	6.19	5.59	18.71	16.84
95th-Percentile Queue Length [ft/ln]	226.27	445.43	126.03	155.05	371.92	151.09	424.69	307.90	154.74	139.80	467.78	421.00

**Movement, Approach, & Intersection Results**

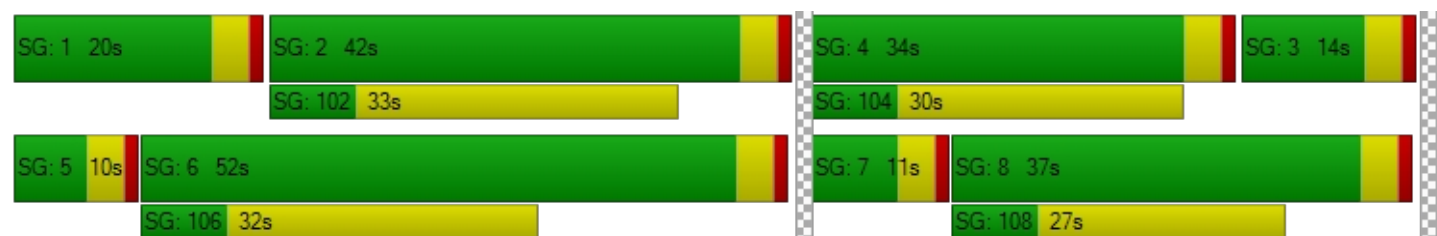
d_M, Delay for Movement [s/veh]	23.40	39.34	30.55	21.90	32.97	27.99	178.53	26.81	23.69	53.16	34.65	33.95
Movement LOS	C	D	C	C	C	C	F	C	C	D	C	C
d_A, Approach Delay [s/veh]	35.09			30.46			53.61			37.90		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	38.97											
Intersection LOS	D											
Intersection V/C	0.838											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.887			2.869			3.038			3.012		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			873			600			545		
d_b, Bicycle Delay [s]	23.56			17.47			26.95			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.682			2.560			2.195			2.566		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	145	1788	0	0	1507	610	0	0	0	230	322	318
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	145	1788	0	0	1507	610	0	0	0	230	322	318
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	447	0	0	377	153	0	0	0	58	81	80
Total Analysis Volume [veh/h]	145	1788	0	0	1507	610	0	0	0	230	322	318
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	71	61	61		21	21	21
g / C, Green / Cycle	0.06	0.71	0.61	0.61		0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.31	0.37	0.39		0.13	0.08	0.18
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	211	4039	2311	1095		380	803	380
d1, Uniform Delay [s]	46.06	6.19	12.21	12.62		35.65	33.98	37.77
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	3.93	0.35	1.21	2.93		1.55	0.32	4.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.44	0.61	0.64		0.60	0.40	0.84
d, Delay for Lane Group [s/veh]	49.99	6.54	13.42	15.55		37.20	34.30	42.65
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.87	4.66	9.35	10.16		5.18	3.38	7.86
50th-Percentile Queue Length [ft/ln]	46.80	116.40	233.85	253.98		129.50	84.56	196.58
95th-Percentile Queue Length [veh/ln]	3.37	8.19	14.37	15.39		8.91	6.09	12.46
95th-Percentile Queue Length [ft/ln]	84.24	204.87	359.24	384.66		222.81	152.21	311.55

**Movement, Approach, & Intersection Results**

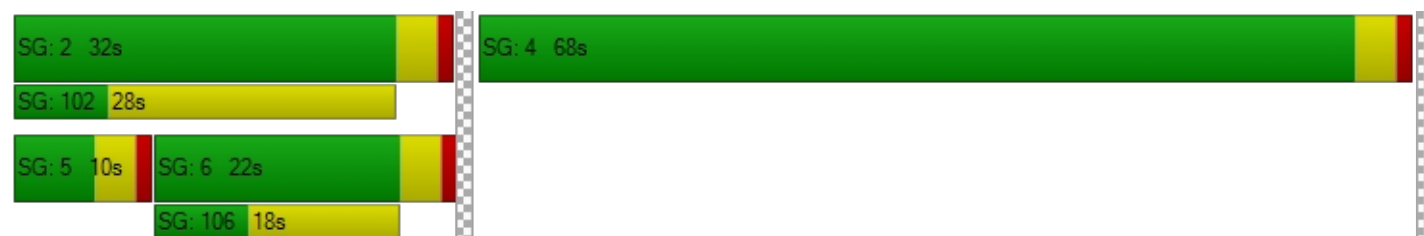
d_M, Delay for Movement [s/veh]	49.99	6.54	0.00	0.00	13.55	15.55	0.00	0.00	0.00	37.20	34.30	42.65
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.80			14.13			0.00			38.12		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	16.67											
Intersection LOS	B											
Intersection V/C	0.693											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.245			2.348		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.623			2.724			4.132			2.277		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







**Intersection Level Of Service Report**  
**Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	24.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.775

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	74	977	0	0	1052	274	0	0	0	159	490	712
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	977	0	0	1052	274	0	0	0	159	490	712
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	244	0	0	263	69	0	0	0	40	123	178
Total Analysis Volume [veh/h]	74	977	0	0	1052	274	0	0	0	159	490	712
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	49	39	39		43	43	43
g / C, Green / Cycle	0.05	0.49	0.39	0.39		0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.23	0.25		0.18	0.17	0.40
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	97	2775	1494	708		780	823	780
d1, Uniform Delay [s]	46.70	15.89	23.99	24.40		19.65	19.34	26.59
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.19
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.85	0.35	1.73	4.13		0.36	0.30	7.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.35	0.59	0.62		0.42	0.39	0.91
d, Delay for Lane Group [s/veh]	58.55	16.24	25.72	28.53		20.01	19.64	34.42
Lane Group LOS	E	B	C	C		C	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.12	4.56	8.40	8.99		5.23	5.04	16.85
50th-Percentile Queue Length [ft/ln]	53.12	113.97	209.98	224.74		130.82	126.06	421.19
95th-Percentile Queue Length [veh/ln]	3.82	8.06	13.15	13.91		8.98	8.72	23.58
95th-Percentile Queue Length [ft/ln]	95.62	201.51	328.80	347.67		224.61	218.12	589.48

**Movement, Approach, & Intersection Results**

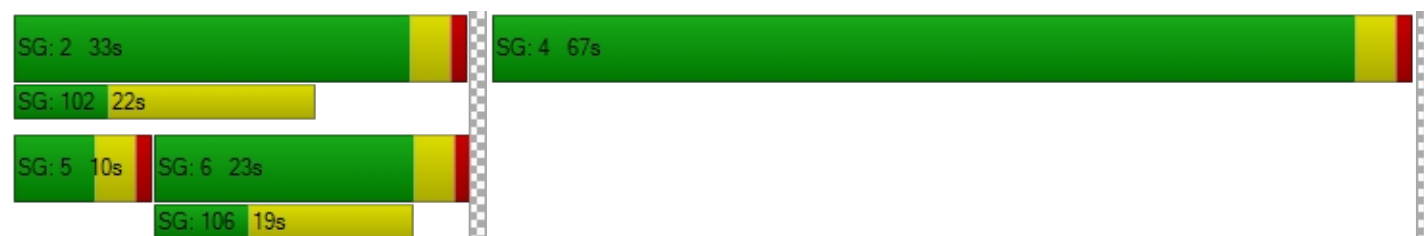
d_M, Delay for Movement [s/veh]	58.55	16.24	0.00	0.00	26.17	28.53	0.00	0.00	0.00	20.01	19.77	34.42
Movement LOS	E	B			C	C				C	B	C
d_A, Approach Delay [s/veh]	19.22			26.65			0.00			27.46		
Approach LOS	B			C			A			C		
d_I, Intersection Delay [s/veh]	24.86											
Intersection LOS	C											
Intersection V/C	0.775											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.128			2.387		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	2.138			2.289			4.132			2.682		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1042	229	335	1235	0	766	216	183	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1042	229	335	1235	0	766	216	183	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	261	57	84	309	0	192	54	46	0	0	0
Total Analysis Volume [veh/h]	0	1042	229	335	1235	0	766	216	183	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	16	45	0	0	55	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	50	50	11	66	26	26	26	
g / C, Green / Cycle	0.50	0.50	0.11	0.66	0.26	0.26	0.26	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.13	0.10	0.22	0.22	0.11	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2867	905	402	3750	918	498	472	
d1, Uniform Delay [s]	15.11	14.15	43.32	7.47	34.85	30.71	30.30	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.36	0.67	4.56	0.24	2.08	0.60	0.52	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.36	0.25	0.83	0.33	0.83	0.43	0.39	
d, Delay for Lane Group [s/veh]	15.47	14.82	47.89	7.71	36.93	31.31	30.82	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.73	3.03	4.28	3.56	8.90	4.37	3.66	
50th-Percentile Queue Length [ft/ln]	118.37	75.83	106.90	89.03	222.52	109.37	91.40	
95th-Percentile Queue Length [veh/ln]	8.30	5.46	7.67	6.41	13.79	7.80	6.58	
95th-Percentile Queue Length [ft/ln]	207.58	136.49	191.69	160.25	344.84	195.12	164.52	

**Movement, Approach, & Intersection Results**

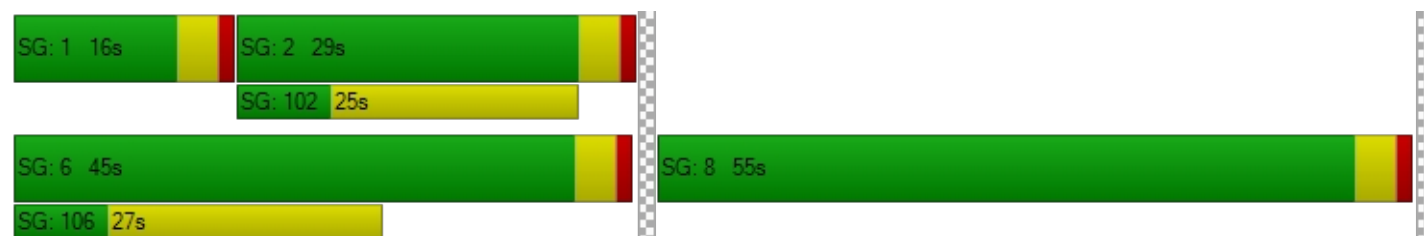
d_M, Delay for Movement [s/veh]	0.00	15.47	14.82	47.89	7.71	0.00	36.93	31.31	30.82	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	15.36			16.28			34.93			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	21.41											
Intersection LOS	C											
Intersection V/C	0.565											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.420			2.100		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			820			1020			0		
d_b, Bicycle Delay [s]	28.13			17.41			12.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.259			2.423			3.482			4.132		
Bicycle LOS	B			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





### Intersection Level Of Service Report

#### Intersection 25: Lemon Street at SR-91 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

#### Intersection Setup

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	803	221	462	720	0	209	545	49	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	803	221	462	720	0	209	545	49	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	201	55	116	180	0	52	136	12	0	0	0
Total Analysis Volume [veh/h]	0	803	221	462	720	0	209	545	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	26	49	0	0	51	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	16	68	24	24	24	
g / C, Green / Cycle	0.48	0.48	0.16	0.68	0.24	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.19	0.13	0.19	0.21	0.20	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1828	866	550	2576	436	460	436	
d1, Uniform Delay [s]	16.42	16.62	40.94	6.40	36.41	35.78	29.53	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.59	1.35	3.56	0.27	5.53	3.56	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.37	0.39	0.84	0.28	0.87	0.81	0.11	
d, Delay for Lane Group [s/veh]	17.01	17.97	44.49	6.67	41.93	39.34	29.65	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	4.95	5.18	5.74	2.79	9.41	8.93	0.93	
50th-Percentile Queue Length [ft/ln]	123.65	129.51	143.42	69.71	235.28	223.18	23.23	
95th-Percentile Queue Length [veh/ln]	8.59	8.91	9.66	5.02	14.44	13.83	1.67	
95th-Percentile Queue Length [ft/ln]	214.83	222.82	241.62	125.48	361.06	345.68	41.81	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	17.15	17.97	44.49	6.67	0.00	41.93	40.15	29.65	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	17.33			21.45			39.97			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	24.99											
Intersection LOS	C											
Intersection V/C	0.605											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.206			2.318		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			900			940			0		
d_b, Bicycle Delay [s]	32.81			15.13			14.05			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.123			2.535			2.222			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	18	315	15	8	526
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	18	315	15	8	526
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	79	4	2	132
Total Analysis Volume [veh/h]	0	18	315	15	8	526
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	0.00	10.09	0.00	0.00	7.95	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.08	0.00	0.00	0.02	0.00
95th-Percentile Queue Length [ft/ln]	0.00	1.91	0.00	0.00	0.49	0.00
d_A, Approach Delay [s/veh]	10.09		0.00		0.12	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.28					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.316

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	623	46	89	453	0	92	37	113	40	0	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	623	46	89	453	0	92	37	113	40	0	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	156	12	22	113	0	23	9	28	10	0	5
Total Analysis Volume [veh/h]	0	623	46	89	453	0	92	37	113	40	0	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	37	0	10	47	0	0	63	0	63	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	91	91	11	11	11	11
g / C, Green / Cycle	0.74	0.74	0.82	0.82	0.10	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.18	0.19	0.05	0.12	0.05	0.08	0.02	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1396	1323	1455	3127	223	221	78	188
d1, Uniform Delay [s]	4.70	4.75	1.81	1.96	46.49	48.12	45.11	44.58
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.41	0.46	0.02	0.10	1.22	3.66	5.06	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.24	0.25	0.06	0.14	0.41	0.68	0.51	0.10
d, Delay for Lane Group [s/veh]	5.10	5.21	1.83	2.06	47.71	51.78	50.17	44.81
Lane Group LOS	A	A	A	A	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.27	2.31	0.24	0.69	2.45	4.23	1.11	0.48
50th-Percentile Queue Length [ft/ln]	56.75	57.67	6.08	17.28	61.23	105.76	27.79	12.06
95th-Percentile Queue Length [veh/ln]	4.09	4.15	0.44	1.24	4.41	7.60	2.00	0.87
95th-Percentile Queue Length [ft/ln]	102.14	103.81	10.95	31.10	110.22	190.08	50.02	21.70

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	5.15	5.21	1.83	2.06	0.00	47.71	51.78	51.78	50.17	0.00	44.81
Movement LOS		A	A	A	A		D	D	D	D		D
d_A, Approach Delay [s/veh]	5.16			2.02			50.23			48.44		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.93											
Intersection LOS	B											
Intersection V/C	0.316											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.689			1.842			2.120		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			782			1073			0		
d_b, Bicycle Delay [s]	26.95			20.40			11.82			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.112			2.007			1.959			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	10	392	237	0	4	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	392	237	0	4	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	98	59	0	1	3
Total Analysis Volume [veh/h]	10	392	237	0	4	13
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.73	0.00	0.00	0.00	11.25	9.60
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	0.57	0.00	0.00	0.00	1.77	1.77
d_A, Approach Delay [s/veh]	0.19		0.00		9.99	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	32	431	242	0	5	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	431	242	0	5	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	108	61	0	1	5
Total Analysis Volume [veh/h]	32	431	242	0	5	19
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	11.90	9.69
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft/ln]	1.86	0.00	0.00	0.00	2.57	2.57
d_A, Approach Delay [s/veh]	0.54		0.00		10.15	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.68					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	12.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	381	18	30	237	25	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	381	18	30	237	25	68
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	5	8	59	6	17
Total Analysis Volume [veh/h]	381	18	30	237	25	68
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.04	0.10
d_M, Delay for Movement [s/veh]	0.00	0.00	8.19	0.00	12.24	11.44
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.08	0.00	0.51	0.51
95th-Percentile Queue Length [ft/ln]	0.00	0.00	1.99	0.00	12.81	12.81
d_A, Approach Delay [s/veh]	0.00		0.92		11.66	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.75					
Intersection LOS	B					



**Intersection Level Of Service Report**  
**Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	119	625	41	0	433	8	0	0	81	0	0	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	625	41	0	433	8	0	0	81	0	0	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	156	10	0	108	2	0	0	20	0	0	5
Total Analysis Volume [veh/h]	119	625	41	0	433	8	0	0	81	0	0	21
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	8.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.12	0.00	0.00	10.61
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.10
95th-Percentile Queue Length [ft/ln]	8.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.62	0.00	0.00	2.45
d_A, Approach Delay [s/veh]	1.31			0.00			10.12			10.61		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	1.56											
Intersection LOS	B											

*APPENDIX O-II*

**YEAR 2020 CUMULATIVE  
FRIDAY DEPARTURE PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	32.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.331

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	89	542	70	116	356	120	125	266	33	54	486	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	542	70	116	356	120	125	266	33	54	486	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	136	18	29	89	30	31	67	8	14	122	30
Total Analysis Volume [veh/h]	89	542	70	116	356	120	125	266	33	54	486	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	42	0	10	38	0	16	42	0	16	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	66	66	6	66	66	9	9	9	13	13	13
g / C, Green / Cycle	0.05	0.60	0.60	0.05	0.60	0.60	0.08	0.08	0.08	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.03	0.10	0.04	0.03	0.08	0.09	0.07	0.05	0.06	0.02	0.09	0.07
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	184	3416	1079	191	2285	1082	151	304	144	423	668	211
d1, Uniform Delay [s]	50.74	9.78	9.21	50.93	9.57	9.59	49.71	49.21	49.42	43.24	46.95	46.01
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.95	0.10	0.12	3.08	0.13	0.28	10.97	2.36	6.10	0.13	1.53	2.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.16	0.06	0.61	0.14	0.14	0.83	0.65	0.70	0.13	0.73	0.57
d, Delay for Lane Group [s/veh]	52.69	9.88	9.32	54.01	9.70	9.87	60.68	51.56	55.52	43.38	48.48	48.41
Lane Group LOS	D	A	A	D	A	A	E	D	E	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.24	1.90	0.72	1.64	1.67	1.66	3.83	2.74	2.95	0.67	4.37	3.24
50th-Percentile Queue Length [ft/ln]	31.06	47.48	17.90	41.12	41.77	41.48	95.83	68.46	73.75	16.63	109.23	81.09
95th-Percentile Queue Length [veh/ln]	2.24	3.42	1.29	2.96	3.01	2.99	6.90	4.93	5.31	1.20	7.80	5.84
95th-Percentile Queue Length [ft/ln]	55.91	85.47	32.22	74.01	75.18	74.66	172.49	123.23	132.76	29.94	194.93	145.97

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	52.69	9.88	9.32	54.01	9.72	9.87	60.68	52.58	55.52	43.38	48.48	48.41
Movement LOS	D	A	A	D	A	A	E	D	E	D	D	D
d_A, Approach Delay [s/veh]	15.26			18.43			55.20			48.05		
Approach LOS	B			B			E			D		
d_I, Intersection Delay [s/veh]	32.28											
Intersection LOS	C											
Intersection V/C	0.331											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.983			2.903			2.759			2.979		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			618			691			691		
d_b, Bicycle Delay [s]	23.56			26.25			23.56			23.56		
I_b,int, Bicycle LOS Score for Intersection	1.945			1.885			1.793			1.923		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	22.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.278

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	17	505	270	36	500	7	20	31	13	340	36	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	505	270	36	500	7	20	31	13	340	36	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	126	68	9	125	2	5	8	3	85	9	0
Total Analysis Volume [veh/h]	17	505	270	36	500	7	20	31	13	340	36	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	30	0	11	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	71	4	72	72	5	5	5	14	14
g / C, Green / Cycle	0.02	0.64	0.04	0.66	0.66	0.05	0.05	0.05	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.01	0.09	0.02	0.11	0.06	0.01	0.02	0.01	0.10	0.10
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	42	3652	67	2489	1179	86	91	86	232	232
d1, Uniform Delay [s]	53.03	7.80	52.05	7.34	6.94	50.48	50.75	50.28	46.62	46.67
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.27	0.08	6.44	0.14	0.14	1.37	2.21	0.80	6.52	6.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.14	0.53	0.16	0.09	0.23	0.34	0.15	0.81	0.81
d, Delay for Lane Group [s/veh]	59.30	7.88	58.49	7.48	7.09	51.84	52.95	51.09	53.14	53.45
Lane Group LOS	E	A	E	A	A	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.54	1.52	1.10	1.79	0.86	0.56	0.88	0.36	5.38	5.45
50th-Percentile Queue Length [ft/ln]	13.40	37.91	27.40	44.64	21.45	14.08	22.06	9.07	134.56	136.19
95th-Percentile Queue Length [veh/ln]	0.96	2.73	1.97	3.21	1.54	1.01	1.59	0.65	9.19	9.28
95th-Percentile Queue Length [ft/ln]	24.12	68.24	49.32	80.36	38.60	25.35	39.71	16.33	229.68	231.89

**Movement, Approach, & Intersection Results**

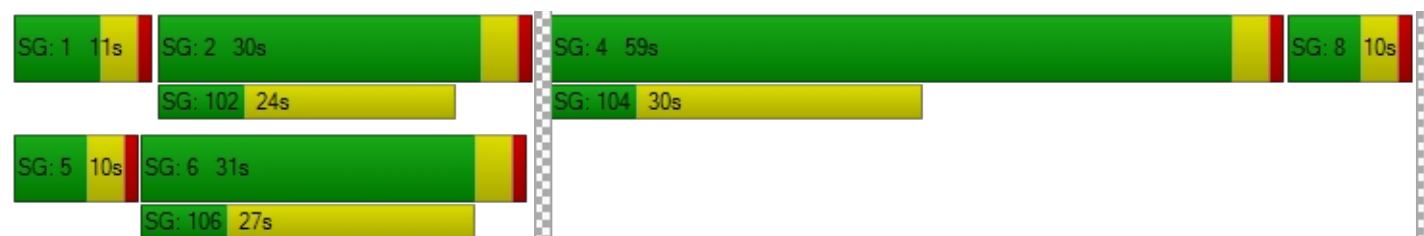
d_M, Delay for Movement [s/veh]	59.30	7.88	0.00	58.49	7.41	7.09	51.84	52.95	51.09	53.28	53.45	0.00
Movement LOS	E	A		E	A	A	D	D	D	D	D	
d_A, Approach Delay [s/veh]	9.55			10.79			52.23			53.30		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	22.74											
Intersection LOS	C											
Intersection V/C	0.278											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.752			2.171			2.094		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			491			109			1000		
d_b, Bicycle Delay [s]	32.07			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	1.847			1.858			1.665			2.180		
Bicycle LOS	A			A			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.376

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	33	697	37	108	584	5	17	41	26	82	68	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	697	37	108	584	5	17	41	26	82	68	201
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	174	9	27	146	1	4	10	7	21	17	50
Total Analysis Volume [veh/h]	33	697	37	108	584	5	17	41	26	82	68	201
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	11	59	0	14	62	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	82	82	6	83	83	11	11	11	11	11	20
g / C, Green / Cycle	0.03	0.74	0.74	0.05	0.76	0.76	0.10	0.10	0.10	0.10	0.10	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.20	0.03	0.15	0.00	0.01	0.02	0.01	0.05	0.04	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	63	1407	1333	185	2881	1365	153	186	176	178	186	336
d1, Uniform Delay [s]	52.18	4.63	4.61	50.92	3.80	3.22	45.19	45.75	45.42	46.90	46.43	40.93
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.66	0.47	0.49	2.92	0.16	0.00	0.32	0.59	0.38	1.87	1.20	1.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.53	0.27	0.27	0.58	0.20	0.00	0.11	0.22	0.15	0.46	0.37	0.60
d, Delay for Lane Group [s/veh]	58.85	5.11	5.10	53.84	3.96	3.23	45.51	46.34	45.80	48.77	47.63	42.63
Lane Group LOS	E	A	A	D	A	A	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	1.01	2.57	2.39	1.53	1.61	0.02	0.44	1.07	0.67	2.21	1.80	5.13
50th-Percentile Queue Length [ft/ln]	25.27	64.30	59.83	38.18	40.20	0.61	10.94	26.64	16.76	55.36	45.11	128.33
95th-Percentile Queue Length [veh/ln]	1.82	4.63	4.31	2.75	2.89	0.04	0.79	1.92	1.21	3.99	3.25	8.85
95th-Percentile Queue Length [ft/ln]	45.48	115.73	107.69	68.72	72.36	1.09	19.69	47.96	30.17	99.65	81.20	221.23

**Movement, Approach, & Intersection Results**

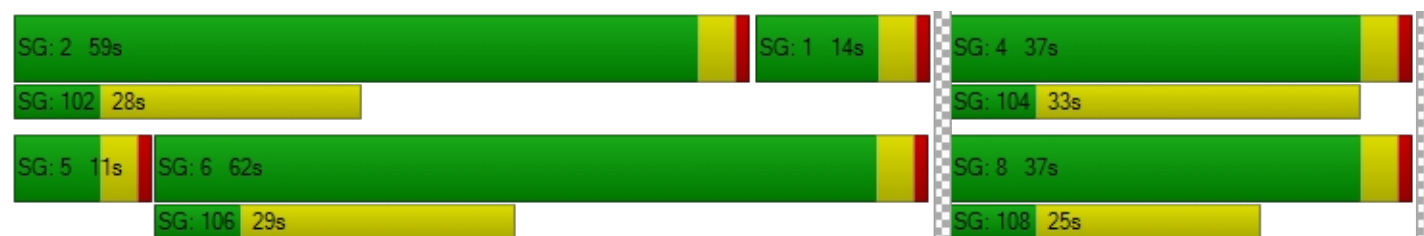
d_M, Delay for Movement [s/veh]	58.85	5.11	5.10	53.84	3.96	3.23	45.51	46.34	45.80	48.77	47.63	42.63
Movement LOS	E	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	7.42			11.68			46.01			45.03		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.64											
Intersection LOS	B											
Intersection V/C	0.376											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.711			2.852			2.187			2.414		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1000			1055			600			600		
d_b, Bicycle Delay [s]	13.75			12.29			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.192			2.135			1.698			2.139		
Bicycle LOS	B			B			A			B		

**Sequence**



Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.326

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	203	206	146	18	142	37	11	142	126	80	132	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	203	206	146	18	142	37	11	142	126	80	132	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	52	37	5	36	9	3	36	32	20	33	13
Total Analysis Volume [veh/h]	203	206	146	18	142	37	11	142	126	80	132	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	37	0	0	33	0	0	40	40	0	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	44	44	44	44	44	11	11	58	11	11	11
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.40	0.10	0.10	0.53	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.11	0.12	0.08	0.01	0.10	0.01	0.07	0.07	0.04	0.05	0.05
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	714	714	714	714	714	137	186	955	95	186	176
d1, Uniform Delay [s]	22.51	22.65	21.78	20.22	22.23	44.97	48.31	13.00	46.78	47.08	46.96
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.98	1.04	0.65	0.07	0.84	0.25	6.34	0.29	17.68	2.21	2.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.29	0.20	0.03	0.25	0.08	0.76	0.13	0.84	0.52	0.49
d, Delay for Lane Group [s/veh]	23.49	23.69	22.43	20.28	23.07	45.22	54.64	13.29	64.45	49.29	49.08
Lane Group LOS	C	C	C	C	C	D	D	B	E	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	3.68	3.89	2.60	0.30	3.26	0.28	4.12	1.63	2.53	2.61	2.36
50th-Percentile Queue Length [ft/ln]	92.08	97.17	64.92	7.39	81.38	7.06	102.90	40.70	63.31	65.34	58.92
95th-Percentile Queue Length [veh/ln]	6.63	7.00	4.67	0.53	5.86	0.51	7.41	2.93	4.56	4.70	4.24
95th-Percentile Queue Length [ft/ln]	165.75	174.90	116.86	13.29	146.48	12.72	185.22	73.26	113.95	117.61	106.06

**Movement, Approach, & Intersection Results**

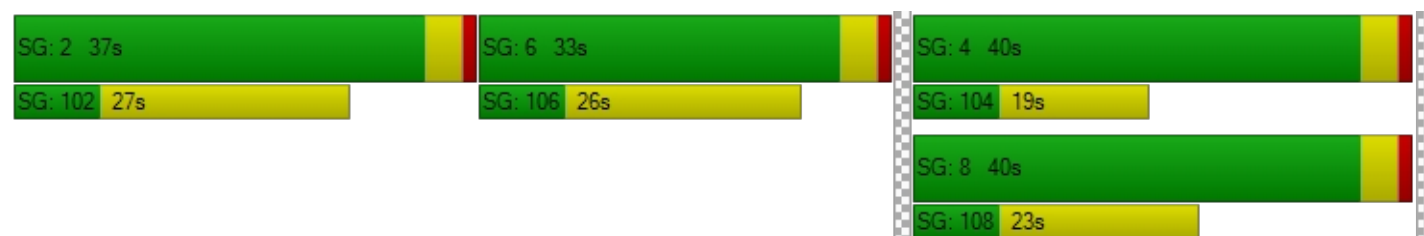
d_M, Delay for Movement [s/veh]	23.49	23.69	22.43	20.28	23.07	23.07	45.22	54.64	13.29	64.45	49.23	49.08
Movement LOS	C	C	C	C	C	C	D	D	B	E	D	D
d_A, Approach Delay [s/veh]	23.29			22.81			35.60			53.83		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.08											
Intersection LOS	C											
Intersection V/C	0.326											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.475			2.117			2.436			2.279		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			527			655			655		
d_b, Bicycle Delay [s]	26.95			29.82			24.89			24.89		
I_b,int, Bicycle LOS Score for Intersection	2.475			1.885			2.020			1.777		
Bicycle LOS	B			A			B			A		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.160

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	91	10	170	185	149	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	10	170	185	149	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	43	46	37	7
Total Analysis Volume [veh/h]	91	10	170	185	149	26
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	95	95	95	95
g / C, Green / Cycle	0.07	0.07	0.86	0.86	0.86	0.86
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	0.09	0.10	0.08	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	120	120	1543	1635	1635	1549
d1, Uniform Delay [s]	50.37	48.09	1.18	1.19	1.16	1.09
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.24	0.29	0.14	0.14	0.11	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.08	0.11	0.11	0.09	0.02
d, Delay for Lane Group [s/veh]	59.61	48.38	1.33	1.33	1.27	1.11
Lane Group LOS	E	D	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.76	0.27	0.32	0.35	0.27	0.04
50th-Percentile Queue Length [ft/ln]	69.09	6.68	8.01	8.65	6.82	1.12
95th-Percentile Queue Length [veh/ln]	4.97	0.48	0.58	0.62	0.49	0.08
95th-Percentile Queue Length [ft/ln]	124.36	12.03	14.42	15.57	12.27	2.02

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.61	48.38	1.33	1.33	1.27	1.11
Movement LOS	E	D	A	A	A	A
d_A, Approach Delay [s/veh]	58.50		1.33		1.25	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	10.46					
Intersection LOS	B					
Intersection V/C	0.160					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.288	2.117	2.096
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.718	4.421
Bicycle LOS	D	E	E

**Sequence**


Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.381

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	79	545	95	42	471	16	18	237	98	98	359	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	545	95	42	471	16	18	237	98	98	359	63
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	136	24	11	118	4	5	59	25	25	90	16
Total Analysis Volume [veh/h]	79	545	95	42	471	16	18	237	98	98	359	63
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	30	0	10	29	0	10	30	0	40	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	78	70	70	78	69	69	24	13	13	24	17	17
g / C, Green / Cycle	0.71	0.64	0.64	0.71	0.63	0.63	0.22	0.12	0.12	0.22	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.04	0.18	0.17	0.02	0.13	0.13	0.01	0.09	0.09	0.05	0.12	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1261	1206	1142	1220	1186	1124	290	223	211	328	296	280
d1, Uniform Delay [s]	4.80	8.94	8.84	4.70	8.95	8.94	34.17	47.31	47.02	35.78	44.42	44.18
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.58	0.57	0.01	0.41	0.42	0.09	6.37	5.21	0.51	3.78	3.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.06	0.28	0.27	0.03	0.21	0.21	0.06	0.80	0.75	0.30	0.75	0.72
d, Delay for Lane Group [s/veh]	4.90	9.51	9.41	4.71	9.36	9.36	34.26	53.68	52.23	36.28	48.20	47.61
Lane Group LOS	A	A	A	A	A	A	C	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.52	3.57	3.19	0.26	2.61	2.46	0.39	5.11	4.47	2.23	6.05	5.45
50th-Percentile Queue Length [ft/ln]	13.07	89.29	79.81	6.47	65.37	61.43	9.77	127.73	111.82	55.82	151.27	136.26
95th-Percentile Queue Length [veh/ln]	0.94	6.43	5.75	0.47	4.71	4.42	0.70	8.82	7.94	4.02	10.08	9.28
95th-Percentile Queue Length [ft/ln]	23.53	160.73	143.67	11.64	117.66	110.57	17.58	220.40	198.53	100.47	252.12	231.97

**Movement, Approach, & Intersection Results**

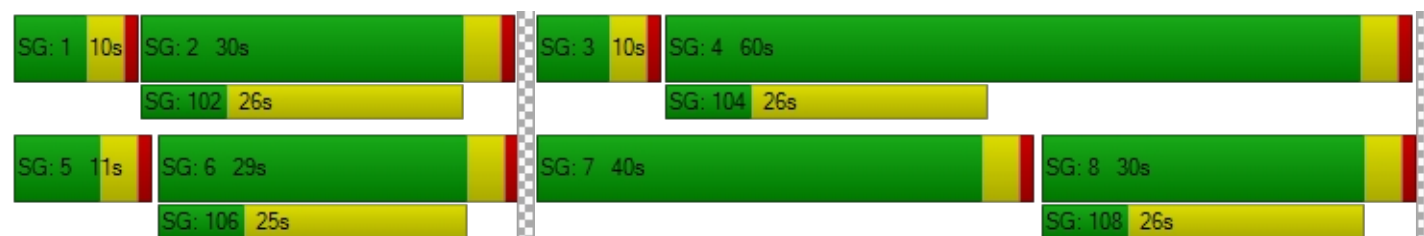
d_M, Delay for Movement [s/veh]	4.90	9.48	9.41	4.71	9.36	9.36	34.26	53.32	52.23	36.28	47.97	47.61
Movement LOS	A	A	A	A	A	A	C	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.96			8.99			52.04			45.73		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	25.15											
Intersection LOS	C											
Intersection V/C	0.381											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.599			2.539			2.539			2.523		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			455			473			1018		
d_b, Bicycle Delay [s]	32.07			32.84			32.07			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.153			1.996			1.851			1.989		
Bicycle LOS	B			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	25.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	92	557	106	98	578	103	110	310	71	135	392	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	557	106	98	578	103	110	310	71	135	392	92
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	139	27	25	145	26	28	78	18	34	98	23
Total Analysis Volume [veh/h]	92	557	106	98	578	103	110	310	71	135	392	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	46	0	10	46	0	11	29	0	25	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	75	65	65	75	65	65	27	14	14	27	16	16
g / C, Green / Cycle	0.68	0.59	0.59	0.68	0.59	0.59	0.25	0.13	0.13	0.25	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.05	0.18	0.17	0.05	0.19	0.18	0.06	0.11	0.10	0.08	0.10	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	1136	1122	1063	1141	1123	1064	372	250	237	364	560	265
d1, Uniform Delay [s]	5.96	11.32	11.19	5.99	11.36	11.22	33.16	46.43	46.16	33.66	44.63	42.18
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	0.72	0.71	0.03	0.75	0.73	0.44	5.96	5.06	0.63	1.61	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.31	0.29	0.09	0.32	0.30	0.30	0.80	0.76	0.37	0.70	0.35
d, Delay for Lane Group [s/veh]	6.10	12.05	11.89	6.02	12.11	11.96	33.60	52.39	51.22	34.29	46.24	42.96
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.71	4.34	3.86	0.73	4.48	3.98	2.40	5.72	5.08	3.00	5.19	2.31
50th-Percentile Queue Length [ft/ln]	17.83	108.58	96.40	18.14	111.90	99.60	60.07	143.01	127.06	75.01	129.81	57.64
95th-Percentile Queue Length [veh/ln]	1.28	7.76	6.94	1.31	7.95	7.17	4.32	9.64	8.78	5.40	8.93	4.15
95th-Percentile Queue Length [ft/ln]	32.10	194.02	173.52	32.65	198.64	179.28	108.12	241.08	219.49	135.01	223.24	103.75

**Movement, Approach, & Intersection Results**

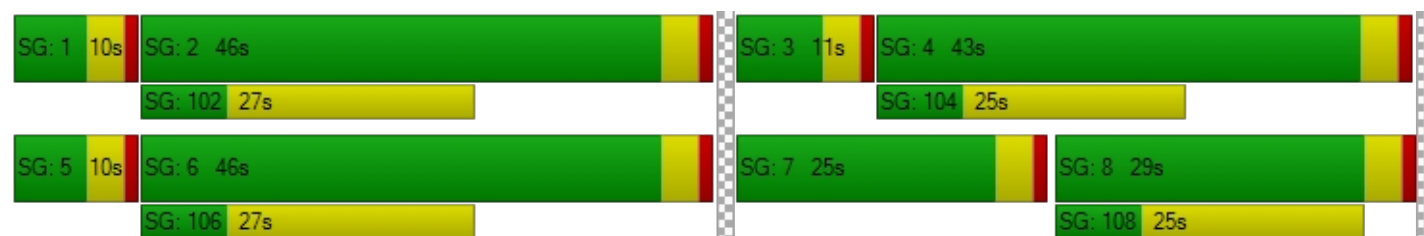
d_M, Delay for Movement [s/veh]	6.10	11.99	11.89	6.02	12.05	11.96	33.60	51.98	51.22	34.29	46.24	42.96
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	11.26			11.28			47.75			43.14		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	25.51											
Intersection LOS	C											
Intersection V/C	0.442											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.638			2.635			2.599			2.731		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	764			764			455			709		
d_b, Bicycle Delay [s]	21.02			21.02			32.84			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.182			2.202			1.965			2.070		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 8: Lemon Street at Chapman Avenue

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.357

#### Intersection Setup

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	93	239	54	137	284	182	84	394	64	67	401	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	239	54	137	284	182	84	394	64	67	401	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	60	14	34	71	46	21	99	16	17	100	9
Total Analysis Volume [veh/h]	93	239	54	137	284	182	84	394	64	67	401	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	20	58	0	10	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	66	66	76	66	66	7	17	17	5	15	15
g / C, Green / Cycle	0.69	0.60	0.60	0.69	0.60	0.60	0.06	0.15	0.15	0.05	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.05	0.06	0.03	0.08	0.13	0.12	0.05	0.13	0.12	0.02	0.11	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	1219	2282	1081	1283	1146	1085	109	287	272	170	527	250
d1, Uniform Delay [s]	5.52	9.37	9.05	5.67	10.01	9.84	50.93	45.41	45.15	50.82	45.66	41.68
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.09	0.09	0.04	0.45	0.40	10.63	6.35	5.47	1.49	2.30	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.10	0.05	0.11	0.22	0.20	0.77	0.84	0.80	0.40	0.76	0.14
d, Delay for Lane Group [s/veh]	5.65	9.46	9.14	5.71	10.46	10.24	61.56	51.75	50.61	52.31	47.96	41.94
Lane Group LOS	A	A	A	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.68	1.21	0.54	0.98	2.84	2.34	2.60	6.84	6.14	0.93	5.43	0.88
50th-Percentile Queue Length [ft/ln]	17.03	30.35	13.59	24.51	70.94	58.61	65.00	171.01	153.53	23.26	135.65	22.00
95th-Percentile Queue Length [veh/ln]	1.23	2.19	0.98	1.76	5.11	4.22	4.68	11.13	10.21	1.68	9.25	1.58
95th-Percentile Queue Length [ft/ln]	30.65	54.63	24.46	44.12	127.70	105.49	117.00	278.24	255.14	41.88	231.16	39.59

**Movement, Approach, & Intersection Results**

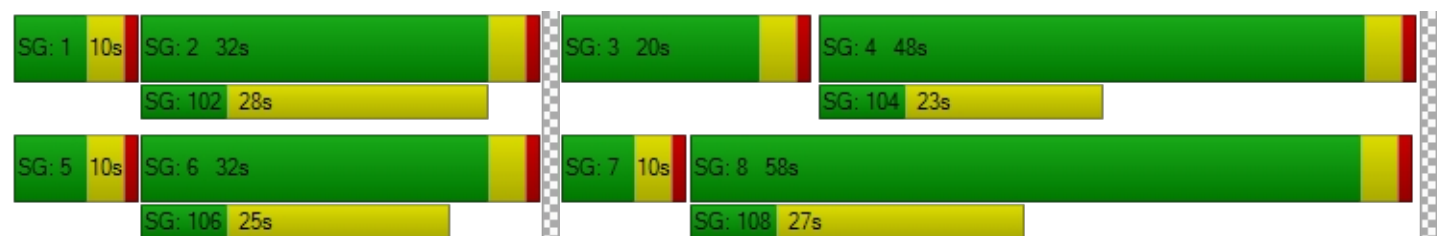
d_M, Delay for Movement [s/veh]	5.65	9.46	9.14	5.71	10.44	10.24	61.56	51.31	50.61	52.31	47.96	41.94
Movement LOS	A	A	A	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.50			9.30			52.82			48.11		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	30.35											
Intersection LOS	C											
Intersection V/C	0.357											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.593			2.497			2.629			2.876		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			800		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			19.80		
I_b,int, Bicycle LOS Score for Intersection	1.878			2.057			2.007			1.975		
Bicycle LOS	A			B			B			A		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.242

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	9	13	18	154	15	34	16	569	10	24	605	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	13	18	154	15	34	16	569	10	24	605	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	5	39	4	9	4	142	3	6	151	37
Total Analysis Volume [veh/h]	9	13	18	154	15	34	16	569	10	24	605	146
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	8	16	86	86	86	80	80	91
g / C, Green / Cycle	0.04	0.04	0.04	0.07	0.14	0.78	0.78	0.78	0.73	0.73	0.83
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.04	0.03	0.01	0.16	0.16	0.01	0.16	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	67	74	70	239	259	1404	1489	1410	1256	2757	1495
d1, Uniform Delay [s]	51.07	51.17	51.33	49.95	41.47	2.60	3.06	3.05	4.20	4.93	1.72
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.89	1.11	1.90	2.88	0.35	0.00	0.30	0.32	0.03	0.18	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.18	0.26	0.64	0.19	0.01	0.20	0.20	0.02	0.22	0.10
d, Delay for Lane Group [s/veh]	51.96	52.28	53.23	52.83	41.82	2.60	3.36	3.37	4.23	5.11	1.75
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.26	0.37	0.52	2.16	1.20	0.06	1.44	1.36	0.14	2.04	0.37
50th-Percentile Queue Length [ft/ln]	6.41	9.24	12.97	53.93	29.97	1.53	35.99	34.04	3.58	51.06	9.37
95th-Percentile Queue Length [veh/ln]	0.46	0.67	0.93	3.88	2.16	0.11	2.59	2.45	0.26	3.68	0.67
95th-Percentile Queue Length [ft/ln]	11.53	16.64	23.34	97.07	53.95	2.76	64.78	61.28	6.44	91.92	16.87

**Movement, Approach, & Intersection Results**

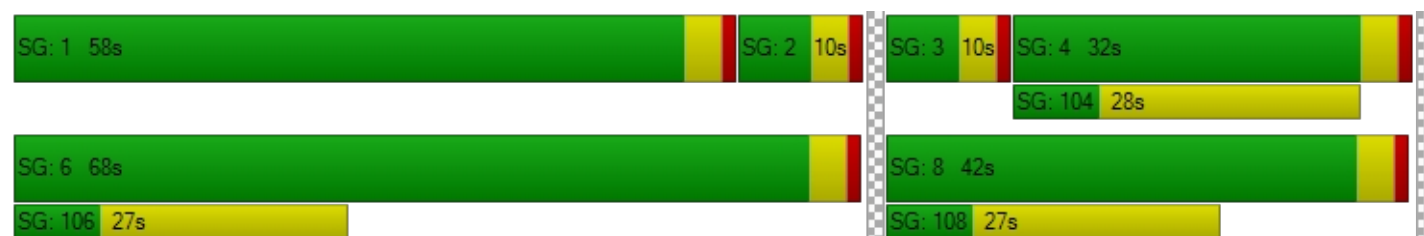
d_M, Delay for Movement [s/veh]	51.96	52.28	53.23	52.83	41.82	41.82	2.60	3.37	3.37	4.23	5.11	1.75
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.64			50.17			3.34			4.45		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.99											
Intersection LOS	B											
Intersection V/C	0.242											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.196			2.250			2.565			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			1.895			2.050			2.199		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	14.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.327

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	82	59	77	41	54	35	45	636	83	92	638	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	82	59	77	41	54	35	45	636	83	92	638	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	15	19	10	14	9	11	159	21	23	160	9
Total Analysis Volume [veh/h]	82	59	77	41	54	35	45	636	83	92	638	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	31	0	15	30	0	11	53	0	11	53	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	16	7	7	16	6	6	86	77	77	86	78	78
g / C, Green / Cycle	0.14	0.07	0.07	0.14	0.05	0.05	0.78	0.70	0.70	0.78	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.02	0.02	0.03	0.20	0.19	0.05	0.18	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	319	128	121	307	98	93	1373	1321	1252	1357	1341	1271
d1, Uniform Delay [s]	42.31	49.43	50.03	41.32	50.73	50.69	2.64	6.36	6.30	2.71	5.83	5.81
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.42	2.58	5.43	0.19	3.48	3.44	0.01	0.54	0.54	0.10	0.47	0.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.26	0.46	0.64	0.13	0.47	0.46	0.03	0.28	0.27	0.07	0.26	0.26
d, Delay for Lane Group [s/veh]	42.73	52.01	55.46	41.52	54.21	54.13	2.65	6.91	6.84	2.81	6.30	6.29
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.04	1.65	2.24	1.00	1.34	1.23	0.17	3.20	2.89	0.40	2.77	2.57
50th-Percentile Queue Length [ft/ln]	51.02	41.32	56.12	24.88	33.49	30.65	4.37	79.98	72.33	9.89	69.21	64.36
95th-Percentile Queue Length [veh/ln]	3.67	2.97	4.04	1.79	2.41	2.21	0.31	5.76	5.21	0.71	4.98	4.63
95th-Percentile Queue Length [ft/ln]	91.84	74.37	101.02	44.78	60.29	55.17	7.86	143.97	130.19	17.80	124.59	115.85

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	42.73	52.01	55.46	41.52	54.20	54.13	2.65	6.88	6.84	2.81	6.30	6.29
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	49.74			50.18			6.63			5.88		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	14.35											
Intersection LOS	B											
Intersection V/C	0.327											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.490			2.253			2.614			2.611		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			891			891		
d_b, Bicycle Delay [s]	31.31			32.07			16.91			16.91		
I_b,int, Bicycle LOS Score for Intersection	1.919			1.667			2.190			2.191		
Bicycle LOS	A			A			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.240

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	25	24	31	31	19	19	24	610	24	45	677	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	24	31	31	19	19	24	610	24	45	677	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	6	8	8	5	5	6	153	6	11	169	7
Total Analysis Volume [veh/h]	25	24	31	31	19	19	24	610	24	45	677	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	66	0	13	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	88	88	88	89	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.80	0.80	0.80	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.02	0.02	0.02	0.01	0.17	0.17	0.03	0.19	0.19
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	90	95	90	105	90	1346	1519	1439	1471	1543	1461
d1, Uniform Delay [s]	50.30	50.24	50.47	50.47	50.68	2.24	2.67	2.67	2.00	2.41	2.40
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.23	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.67	1.36	2.23	1.56	3.08	0.02	0.33	0.34	0.04	0.17	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.25	0.34	0.30	0.42	0.02	0.22	0.21	0.03	0.24	0.23
d, Delay for Lane Group [s/veh]	51.97	51.60	52.70	52.04	53.76	2.27	3.00	3.00	2.04	2.57	2.77
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.70	0.67	0.88	0.87	1.09	0.09	1.42	1.33	0.15	1.35	1.35
50th-Percentile Queue Length [ft/ln]	17.61	16.79	22.01	21.75	27.30	2.19	35.38	33.20	3.68	33.78	33.63
95th-Percentile Queue Length [veh/ln]	1.27	1.21	1.58	1.57	1.97	0.16	2.55	2.39	0.27	2.43	2.42
95th-Percentile Queue Length [ft/ln]	31.69	30.22	39.62	39.15	49.15	3.94	63.69	59.76	6.63	60.81	60.54

**Movement, Approach, & Intersection Results**

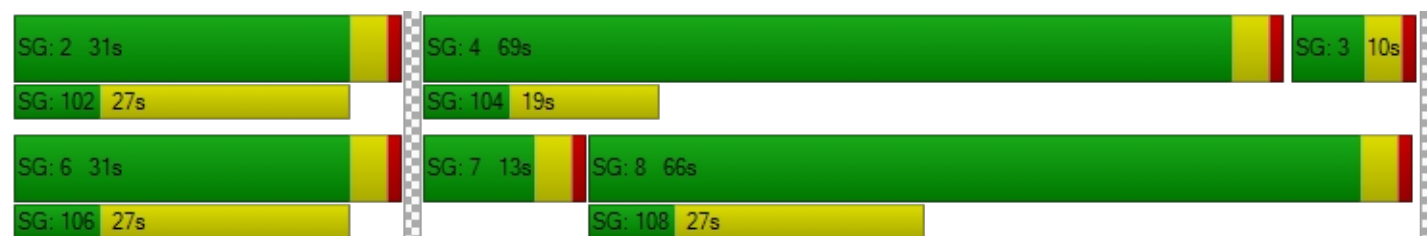
d_M, Delay for Movement [s/veh]	51.97	51.60	52.70	52.04	53.76	53.76	2.27	3.00	3.00	2.04	2.67	2.77
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.14			52.98			2.97			2.63		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.56											
Intersection LOS	A											
Intersection V/C	0.240											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.230			2.028			2.614			2.630		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1127			1182		
d_b, Bicycle Delay [s]	31.31			31.31			10.47			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.692			1.673			2.102			2.177		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.390

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	95	277	93	111	314	195	159	410	66	114	513	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	277	93	111	314	195	159	410	66	114	513	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	69	23	28	79	49	40	103	17	29	128	35
Total Analysis Volume [veh/h]	95	277	93	111	314	195	159	410	66	114	513	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	14	37	37	10	48	0	14	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	64	64	6	63	73	6	15	15	9	18	18
g / C, Green / Cycle	0.06	0.58	0.58	0.05	0.57	0.66	0.05	0.14	0.14	0.08	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.05	0.03	0.08	0.11	0.05	0.11	0.04	0.06	0.14	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	116	2213	1048	187	2171	1194	194	531	252	142	621	294
d1, Uniform Delay [s]	50.87	10.36	10.13	50.93	11.02	7.01	51.46	45.66	42.28	49.85	44.53	41.72
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.12	0.12	0.17	2.96	0.14	0.06	8.33	2.41	0.55	9.93	2.86	1.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.13	0.09	0.59	0.14	0.16	0.82	0.77	0.26	0.80	0.83	0.47
d, Delay for Lane Group [s/veh]	64.00	10.48	10.30	53.89	11.16	7.07	59.80	48.07	42.83	59.79	47.39	42.88
Lane Group LOS	E	B	B	D	B	A	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.00	1.51	1.02	1.57	1.79	1.64	2.39	5.56	1.64	3.47	6.98	3.49
50th-Percentile Queue Length [ft/ln]	75.07	37.70	25.38	39.27	44.64	40.97	59.75	138.99	41.07	86.74	174.41	87.17
95th-Percentile Queue Length [veh/ln]	5.41	2.71	1.83	2.83	3.21	2.95	4.30	9.43	2.96	6.25	11.31	6.28
95th-Percentile Queue Length [ft/ln]	135.13	67.86	45.68	70.69	80.36	73.74	107.55	235.67	73.93	156.13	282.71	156.91

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	64.00	10.48	10.30	53.89	11.16	7.07	59.80	48.07	42.83	59.79	47.39	42.88
Movement LOS	E	B	B	D	B	A	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	21.38			17.53			50.46			48.42		
Approach LOS	C			B			D			D		
d_I, Intersection Delay [s/veh]	36.17											
Intersection LOS	D											
Intersection V/C	0.390											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.618			2.770			2.804			2.687		
Crosswalk LOS	B			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			800			873		
d_b, Bicycle Delay [s]	29.09			26.95			19.80			17.47		
I_b,int, Bicycle LOS Score for Intersection	1.943			2.071			2.083			2.191		
Bicycle LOS	A			B			B			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.458

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	78	0	139	0	630	365	230	718	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	78	0	139	0	630	365	230	718	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	0	35	0	158	91	58	180	0
Total Analysis Volume [veh/h]	0	0	0	78	0	139	0	630	365	230	718	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	55	0	0	19	0	36	55	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		11	11	71	71	16	91
g / C, Green / Cycle		0.10	0.10	0.64	0.64	0.15	0.83
(v / s)_i Volume / Saturation Flow Rate		0.04	0.08	0.17	0.20	0.13	0.19
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		178	178	2448	1160	266	3148
d1, Uniform Delay [s]		46.69	48.40	8.34	8.72	45.78	1.99
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.70	7.32	0.25	0.71	8.21	0.17
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.44	0.78	0.26	0.31	0.86	0.23
d, Delay for Lane Group [s/veh]		48.39	55.72	8.59	9.44	53.99	2.16
Lane Group LOS		D	E	A	A	D	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.09	4.07	3.10	3.88	6.71	1.11
50th-Percentile Queue Length [ft/ln]		52.35	101.87	77.47	97.03	167.80	27.85
95th-Percentile Queue Length [veh/ln]		3.77	7.33	5.58	6.99	10.96	2.01
95th-Percentile Queue Length [ft/ln]		94.24	183.37	139.44	174.66	274.02	50.14

**Movement, Approach, & Intersection Results**

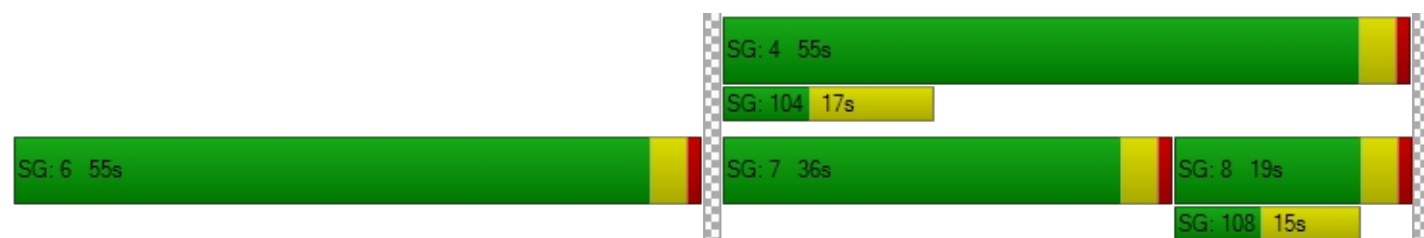
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	48.39	48.39	55.72	0.00	8.59	9.44	53.99	2.16	0.00
Movement LOS				D	D	E		A	A	D	A	
d_A, Approach Delay [s/veh]	0.00			53.08			8.90			14.74		
Approach LOS	A			D			A			B		
d_I, Intersection Delay [s/veh]	15.90											
Intersection LOS	B											
Intersection V/C	0.458											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.013	1.830	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	927	273	927
d_b, Bicycle Delay [s]	55.00	15.82	41.02	15.82
I_b,int, Bicycle LOS Score for Intersection	4.132	1.918	2.107	2.342
Bicycle LOS	D	A	B	B

**Sequence**

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	391	0	322	0	0	0	162	550	0	0	547	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	391	0	322	0	0	0	162	550	0	0	547	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	98	0	81	0	0	0	41	138	0	0	137	29
Total Analysis Volume [veh/h]	391	0	322	0	0	0	162	550	0	0	547	115
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	21	0	0	0	0	0	70	89	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17		12	85	69	69
g / C, Green / Cycle	0.15	0.15	0.15		0.11	0.77	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.13		0.09	0.14	0.17	0.18
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	277	277	277		196	2939	1193	1131
d1, Uniform Delay [s]	45.66	45.40	45.04		47.97	3.30	9.21	9.32
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.94	7.83	5.88		8.46	0.14	0.58	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.86	0.82		0.83	0.19	0.28	0.29
d, Delay for Lane Group [s/veh]	55.61	53.23	50.91		56.43	3.44	9.79	9.98
Lane Group LOS	E	D	D		E	A	A	A
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.37	6.93	6.40		4.79	1.35	3.59	3.64
50th-Percentile Queue Length [ft/ln]	184.21	173.15	159.96		119.85	33.87	89.71	91.09
95th-Percentile Queue Length [veh/ln]	11.82	11.24	10.55		8.38	2.44	6.46	6.56
95th-Percentile Queue Length [ft/ln]	295.51	281.05	263.67		209.62	60.96	161.48	163.97

**Movement, Approach, & Intersection Results**

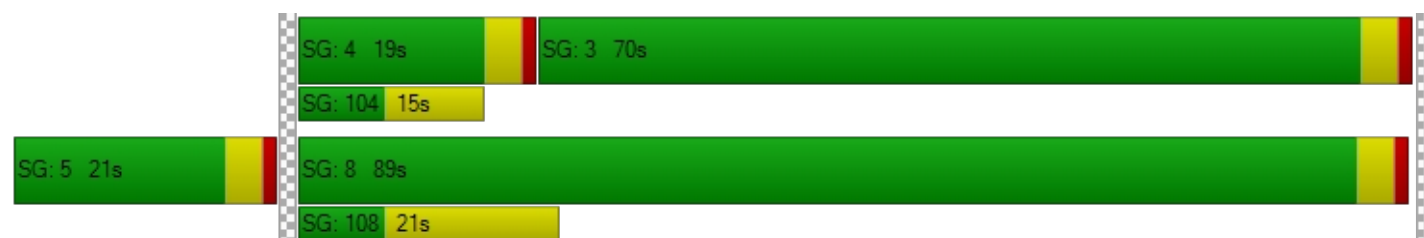
d_M, Delay for Movement [s/veh]	54.69	0.00	51.54	0.00	0.00	0.00	56.43	3.44	0.00	0.00	9.86	9.98
Movement LOS	D		D				E	A			A	A
d_A, Approach Delay [s/veh]	53.32			0.00			15.50			9.88		
Approach LOS	D			A			B			A		
d_I, Intersection Delay [s/veh]	26.64											
Intersection LOS	C											
Intersection V/C	0.462											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.181	1.703	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	1545	273
d_b, Bicycle Delay [s]	55.00	55.00	2.84	41.02
I_b,int, Bicycle LOS Score for Intersection	5.309	4.132	2.147	2.106
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	3.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.141

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	19	368	12	10	419	6	7	5	16	3	9	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	368	12	10	419	6	7	5	16	3	9	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	92	3	3	105	2	2	1	4	1	2	2
Total Analysis Volume [veh/h]	19	368	12	10	419	6	7	5	16	3	9	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	98	98	98	98	98	98	3	3
g / C, Green / Cycle	0.90	0.90	0.90	0.90	0.90	0.90	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.10	0.01	0.12	0.11	0.02	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1611	1701	1612	1614	1701	1612	98	95
d1, Uniform Delay [s]	0.61	0.67	0.67	0.60	0.68	0.68	52.34	52.10
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.14	0.14	0.01	0.16	0.16	1.58	1.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.01	0.12	0.11	0.01	0.13	0.13	0.29	0.21
d, Delay for Lane Group [s/veh]	0.62	0.81	0.81	0.61	0.83	0.84	53.92	53.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.01	0.13	0.13	0.01	0.15	0.14	0.80	0.57
50th-Percentile Queue Length [ft/ln]	0.29	3.27	3.16	0.15	3.70	3.59	20.06	14.22
95th-Percentile Queue Length [veh/ln]	0.02	0.24	0.23	0.01	0.27	0.26	1.44	1.02
95th-Percentile Queue Length [ft/ln]	0.53	5.89	5.68	0.28	6.67	6.46	36.10	25.59

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.62	0.81	0.81	0.61	0.84	0.84	53.92	53.92	53.92	53.20	53.20	53.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	0.80			0.83			53.92			53.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	3.69											
Intersection LOS	A											
Intersection V/C	0.141											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.477			2.479			1.782			1.762		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.889			1.918			1.606			1.593		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	105	638	128	67	734	99	92	286	123	183	294	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	638	128	67	734	99	92	286	123	183	294	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	160	32	17	184	25	23	72	31	46	74	15
Total Analysis Volume [veh/h]	105	638	128	67	734	99	92	286	123	183	294	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	13	33	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	29	29	64	52	52	64	54	54
g / C, Green / Cycle	0.26	0.26	0.26	0.26	0.26	0.26	0.58	0.47	0.47	0.58	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.06	0.17	0.07	0.04	0.23	0.22	0.05	0.08	0.07	0.10	0.08	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	226	1005	476	297	493	467	1057	1794	850	1056	1864	883
d1, Uniform Delay [s]	31.61	35.77	32.04	31.32	39.15	38.67	10.30	16.58	16.45	10.88	15.49	14.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.48	0.67	0.30	0.38	5.48	4.36	0.04	0.19	0.36	0.36	0.18	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.46	0.63	0.27	0.23	0.88	0.85	0.09	0.16	0.14	0.17	0.16	0.07
d, Delay for Lane Group [s/veh]	33.09	36.44	32.34	31.70	44.63	43.02	10.34	16.77	16.81	11.24	15.67	14.92
Lane Group LOS	C	D	C	C	D	D	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.28	7.61	2.74	1.41	11.95	10.60	0.98	2.09	1.83	2.14	2.07	0.81
50th-Percentile Queue Length [ft/ln]	56.96	190.17	68.51	35.14	298.66	265.01	24.47	52.31	45.77	53.49	51.65	20.22
95th-Percentile Queue Length [veh/ln]	4.10	12.13	4.93	2.53	17.61	15.94	1.76	3.77	3.30	3.85	3.72	1.46
95th-Percentile Queue Length [ft/ln]	102.53	303.24	123.31	63.25	440.37	398.50	44.04	94.17	82.38	96.28	92.97	36.40

**Movement, Approach, & Intersection Results**

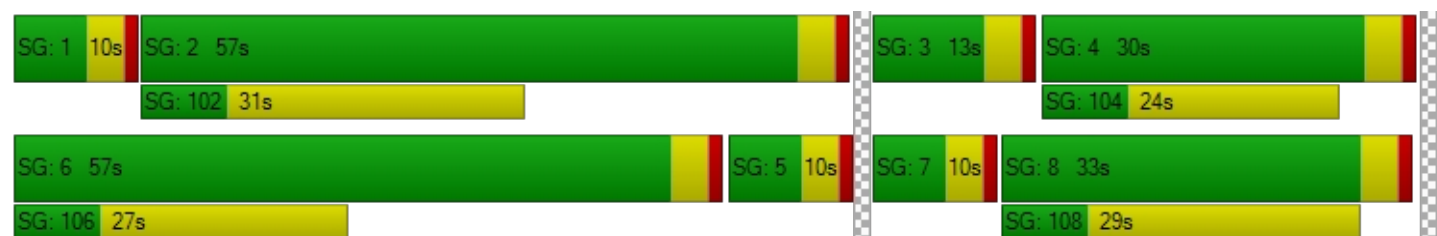
d_M, Delay for Movement [s/veh]	33.09	36.44	32.34	31.70	43.98	43.02	10.34	16.77	16.81	11.24	15.67	14.92
Movement LOS	C	D	C	C	D	D	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	35.43			42.96			15.60			14.07		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	30.23											
Intersection LOS	C											
Intersection V/C	0.443											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.901			2.705			2.718			2.646		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			473		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.278			2.302			1.973			2.002		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.293

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	88	283	129	30	398	52	55	350	88	78	266	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	283	129	30	398	52	55	350	88	78	266	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	71	32	8	100	13	14	88	22	20	67	9
Total Analysis Volume [veh/h]	88	283	129	30	398	52	55	350	88	78	266	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	54	0	16	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	16	16	16	5	67	67	5	67	67
g / C, Green / Cycle	0.17	0.17	0.17	0.15	0.15	0.15	0.04	0.60	0.60	0.05	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.07	0.02	0.12	0.12	0.03	0.09	0.05	0.02	0.07	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	224	633	300	243	283	268	82	2295	1087	176	2314	1096
d1, Uniform Delay [s]	40.20	41.31	41.18	40.57	45.52	45.32	51.75	9.52	9.08	50.77	9.05	8.58
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.12	0.50	0.97	0.23	6.23	5.63	9.26	0.14	0.15	1.73	0.10	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.39	0.45	0.43	0.12	0.83	0.80	0.67	0.15	0.08	0.44	0.11	0.03
d, Delay for Lane Group [s/veh]	41.31	41.80	42.16	40.80	51.74	50.95	61.01	9.66	9.23	52.51	9.15	8.63
Lane Group LOS	D	D	D	D	D	D	E	A	A	D	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.16	3.50	3.22	0.72	6.68	6.08	1.70	1.82	0.89	1.09	1.32	0.33
50th-Percentile Queue Length [ft/ln]	54.01	87.46	80.53	18.04	167.09	152.07	42.57	45.43	22.37	27.15	33.12	8.23
95th-Percentile Queue Length [veh/ln]	3.89	6.30	5.80	1.30	10.92	10.13	3.07	3.27	1.61	1.95	2.38	0.59
95th-Percentile Queue Length [ft/ln]	97.21	157.42	144.96	32.46	273.09	253.19	76.63	81.77	40.26	48.87	59.62	14.81

**Movement, Approach, & Intersection Results**

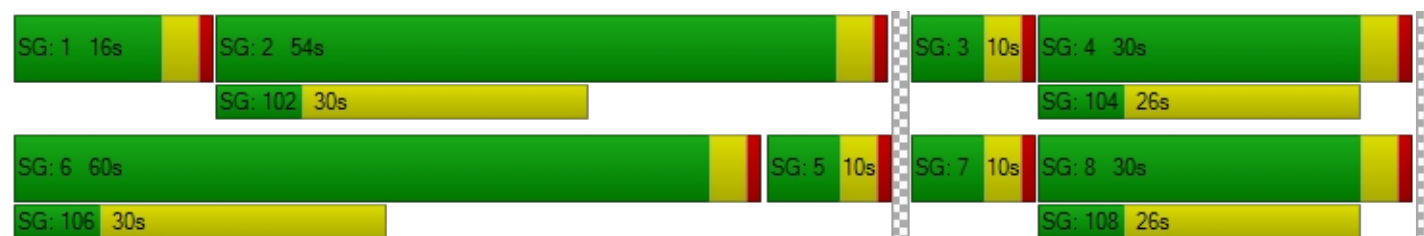
d_M, Delay for Movement [s/veh]	41.31	41.80	42.16	40.80	51.42	50.95	61.01	9.66	9.23	52.51	9.15	8.63
Movement LOS	D	D	D	D	D	D	E	A	A	D	A	A
d_A, Approach Delay [s/veh]	41.81			50.70			15.31			18.05		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	32.21											
Intersection LOS	C											
Intersection V/C	0.293											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.635			2.476			2.702			2.731		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			1018			473			473		
d_b, Bicycle Delay [s]	16.36			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	1.972			1.956			1.966			1.871		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	6.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.335

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	31	891	25	24	924	31	22	44	26	52	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	891	25	24	924	31	22	44	26	52	39	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	223	6	6	231	8	6	11	7	13	10	4
Total Analysis Volume [veh/h]	31	891	25	24	924	31	22	44	26	52	39	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	77	0	0	77	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.25	0.01	0.26	0.26	0.05	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1481	1637	1551	1486	1637	1551	159	70	118
d1, Uniform Delay [s]	1.07	1.40	1.40	1.07	1.42	1.42	50.52	49.36	49.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.45	0.46	0.02	0.47	0.49	3.30	14.54	2.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.29	0.29	0.02	0.30	0.30	0.58	0.75	0.45
d, Delay for Lane Group [s/veh]	1.10	1.85	1.86	1.09	1.90	1.91	53.82	63.90	52.03
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.05	1.05	0.99	0.04	1.11	1.05	2.63	1.65	1.49
50th-Percentile Queue Length [ft/ln]	1.33	26.19	24.74	1.02	27.74	26.14	65.81	41.37	37.18
95th-Percentile Queue Length [veh/ln]	0.10	1.89	1.78	0.07	2.00	1.88	4.74	2.98	2.68
95th-Percentile Queue Length [ft/ln]	2.39	47.13	44.54	1.84	49.94	47.06	118.45	74.46	66.92

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.10	1.86	1.86	1.09	1.90	1.91	53.82	53.82	53.82	63.90	52.03	52.03
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	1.83			1.88			53.82			57.91		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	6.88											
Intersection LOS	A											
Intersection V/C	0.335											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.763			2.712			1.863			2.048		
Crosswalk LOS	C			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1327			1327			527			527		
d_b, Bicycle Delay [s]	6.22			6.22			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.341			2.367			1.711			1.733		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 19: Lemon Street at Valencia Drive

Control Type:	Signalized	Delay (sec / veh):	8.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.225

#### Intersection Setup

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	63	523	39	35	471	39	28	27	45	49	20	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	523	39	35	471	39	28	27	45	49	20	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	131	10	9	118	10	7	7	11	12	5	7
Total Analysis Volume [veh/h]	63	523	39	35	471	39	28	27	45	49	20	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	85	0	0	85	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	94	94	94	94	94	94	8	8
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.04	0.15	0.15	0.02	0.14	0.14	0.06	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1514	1626	1541	1509	1626	1541	170	178
d1, Uniform Delay [s]	1.18	1.35	1.34	1.16	1.32	1.32	50.16	50.04
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.24	0.25	0.03	0.22	0.22	3.20	2.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.18	0.18	0.02	0.16	0.16	0.59	0.54
d, Delay for Lane Group [s/veh]	1.23	1.59	1.59	1.19	1.54	1.54	53.36	52.58
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.63	0.59	0.07	0.56	0.52	2.85	2.71
50th-Percentile Queue Length [ft/ln]	3.01	15.75	14.68	1.65	14.05	13.10	71.22	67.72
95th-Percentile Queue Length [veh/ln]	0.22	1.13	1.06	0.12	1.01	0.94	5.13	4.88
95th-Percentile Queue Length [ft/ln]	5.42	28.35	26.42	2.96	25.30	23.57	128.19	121.89

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.23	1.59	1.59	1.19	1.54	1.54	53.36	53.36	53.36	52.58	52.58	52.58
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.55			1.52			53.36			52.58		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	8.92											
Intersection LOS	A											
Intersection V/C	0.225											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.611			2.568			1.922			1.870		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	382			382			1473			1473		
d_b, Bicycle Delay [s]	36.00			36.00			3.82			3.82		
I_b,int, Bicycle LOS Score for Intersection	2.075			2.009			1.725			1.718		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 20: Harbor Boulevard at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.537

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	134	784	127	131	926	132	153	313	138	210	500	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	134	784	127	131	926	132	153	313	138	210	500	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	196	32	33	232	33	38	78	35	53	125	41
Total Analysis Volume [veh/h]	134	784	127	131	926	132	153	313	138	210	500	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	51	0	10	51	0	12	39	0	10	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	29	29	6	29	29	11	44	44	15	48	48
g / C, Green / Cycle	0.05	0.26	0.26	0.05	0.26	0.26	0.10	0.40	0.40	0.14	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.07	0.04	0.23	0.11	0.09	0.05	0.08	0.12	0.09	0.09
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	194	1001	474	192	999	473	186	2286	722	244	2468	779
d1, Uniform Delay [s]	51.08	37.63	32.13	51.09	38.73	33.50	48.36	20.90	21.39	46.59	19.40	19.48
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.37	1.38	0.30	4.24	2.42	0.56	8.70	0.12	0.59	8.72	0.19	0.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.78	0.27	0.68	0.87	0.41	0.82	0.14	0.19	0.86	0.20	0.21
d, Delay for Lane Group [s/veh]	55.45	39.01	32.43	55.34	41.15	34.06	57.06	21.02	21.98	55.31	19.58	20.10
Lane Group LOS	E	D	C	E	D	C	E	C	C	E	B	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.93	9.89	2.72	1.88	11.35	4.32	4.55	1.73	2.42	6.19	2.68	2.75
50th-Percentile Queue Length [ft/ln]	48.23	247.29	68.07	47.09	283.65	107.93	113.79	43.18	60.51	154.72	66.94	68.86
95th-Percentile Queue Length [veh/ln]	3.47	15.05	4.90	3.39	16.87	7.72	8.05	3.11	4.36	10.27	4.82	4.96
95th-Percentile Queue Length [ft/ln]	86.82	376.24	122.53	84.77	421.75	193.12	201.26	77.72	108.92	256.72	120.49	123.95

**Movement, Approach, & Intersection Results**

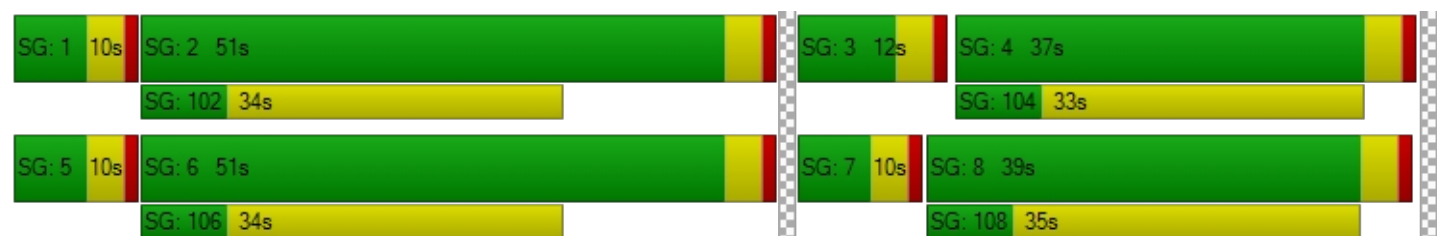
d_M, Delay for Movement [s/veh]	55.45	39.01	32.43	55.34	40.68	34.06	57.06	21.02	21.98	55.31	19.58	20.10
Movement LOS	E	D	C	E	D	C	E	C	C	E	B	C
d_A, Approach Delay [s/veh]	40.32			41.56			30.37			28.26		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	36.26											
Intersection LOS	D											
Intersection V/C	0.537											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.018			2.923			2.902			2.911		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			855			636			600		
d_b, Bicycle Delay [s]	18.04			18.04			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.422			2.214			1.892			2.041		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.437

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	195	472	52	90	525	80	94	468	203	79	341	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	195	472	52	90	525	80	94	468	203	79	341	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	118	13	23	131	20	24	117	51	20	85	15
Total Analysis Volume [veh/h]	195	472	52	90	525	80	94	468	203	79	341	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	56	0	10	37	0	10	34	0	10	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	18	18	18	7	64	64	5	62	62
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.17	0.17	0.07	0.58	0.58	0.05	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.11	0.12	0.03	0.05	0.14	0.04	0.05	0.12	0.11	0.02	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	230	631	299	230	631	299	122	2217	1050	175	1075	1019
d1, Uniform Delay [s]	42.01	43.68	39.40	40.27	44.39	40.04	50.47	10.89	10.76	50.80	11.66	11.61
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.45	1.79	0.27	1.08	2.93	0.47	9.86	0.22	0.41	1.81	0.41	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.85	0.75	0.17	0.39	0.83	0.27	0.77	0.21	0.19	0.45	0.20	0.19
d, Delay for Lane Group [s/veh]	50.46	45.48	39.67	41.36	47.32	40.51	60.33	11.11	11.17	52.60	12.07	12.01
Lane Group LOS	D	D	D	D	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.48	6.25	1.23	2.21	7.14	1.93	2.87	2.69	2.37	1.10	2.58	2.34
50th-Percentile Queue Length [ft/ln]	137.07	156.23	30.83	55.27	178.54	48.30	71.86	67.25	59.22	27.52	64.41	58.42
95th-Percentile Queue Length [veh/ln]	9.32	10.35	2.22	3.98	11.52	3.48	5.17	4.84	4.26	1.98	4.64	4.21
95th-Percentile Queue Length [ft/ln]	233.08	258.73	55.50	99.48	288.11	86.93	129.34	121.05	106.59	49.54	115.94	105.15

**Movement, Approach, & Intersection Results**

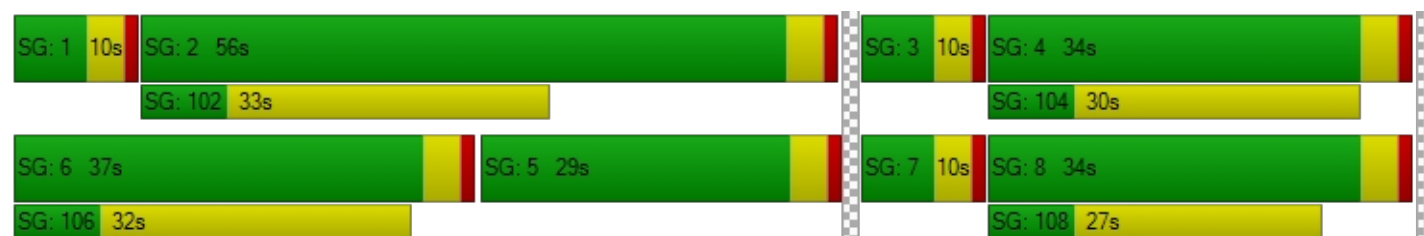
d_M, Delay for Movement [s/veh]	50.46	45.48	39.67	41.36	47.32	40.51	60.33	11.11	11.17	52.60	12.05	12.01
Movement LOS	D	D	D	D	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	46.41			45.76			17.17			18.71		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	32.82											
Intersection LOS	C											
Intersection V/C	0.437											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.710			2.677			2.780			2.767		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	945			600			545			545		
d_b, Bicycle Delay [s]	15.29			26.95			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.153			2.133			1.980			1.956		
Bicycle LOS	B			B			A			A		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	15.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.492

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	115	896	0	0	958	477	0	0	0	148	234	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	896	0	0	958	477	0	0	0	148	234	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	224	0	0	240	119	0	0	0	37	59	61
Total Analysis Volume [veh/h]	115	896	0	0	958	477	0	0	0	148	234	242
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	37	0	0	27	0	0	0	0	0	63	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	76	66	66		16	16	16
g / C, Green / Cycle	0.06	0.76	0.66	0.66		0.16	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.25	0.27		0.08	0.06	0.13
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	205	4303	2495	1182		297	627	297
d1, Uniform Delay [s]	45.83	3.56	7.88	8.04		37.99	37.15	40.28
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.41	0.11	0.45	1.03		1.29	0.37	5.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.21	0.38	0.40		0.50	0.37	0.81
d, Delay for Lane Group [s/veh]	48.24	3.67	8.33	9.07		39.28	37.52	45.69
Lane Group LOS	D	A	A	A		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.45	1.43	4.40	4.67		3.38	2.56	6.13
50th-Percentile Queue Length [ft/ln]	36.32	35.82	110.04	116.65		84.56	64.12	153.13
95th-Percentile Queue Length [veh/ln]	2.61	2.58	7.84	8.21		6.09	4.62	10.18
95th-Percentile Queue Length [ft/ln]	65.37	64.48	196.06	205.22		152.20	115.41	254.61

**Movement, Approach, & Intersection Results**

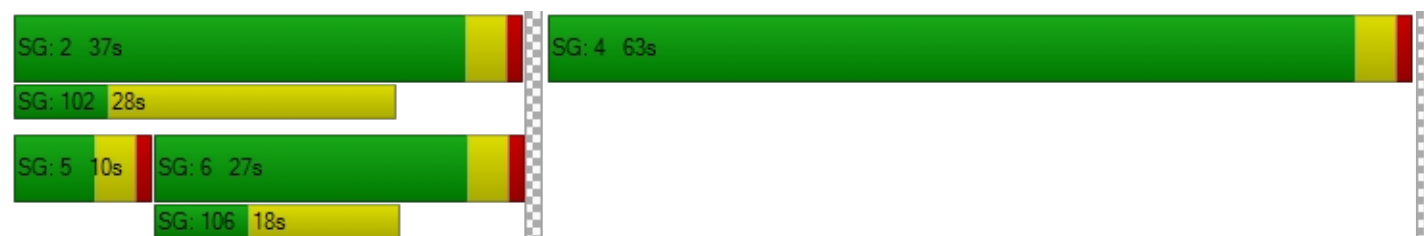
d_M, Delay for Movement [s/veh]	48.24	3.67	0.00	0.00	8.33	9.07	0.00	0.00	0.00	39.28	37.52	45.69
Movement LOS	D	A			A	A				D	D	D
d_A, Approach Delay [s/veh]	8.74			8.58			0.00			41.10		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	15.24											
Intersection LOS	B											
Intersection V/C	0.492											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.122			2.288		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	660			460			0			1180		
d_b, Bicycle Delay [s]	22.45			29.65			50.00			8.41		
I_b,int, Bicycle LOS Score for Intersection	2.116			2.349			4.132			2.074		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.519

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	48	361	0	0	729	194	0	0	0	110	375	467
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	361	0	0	729	194	0	0	0	110	375	467
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	90	0	0	182	49	0	0	0	28	94	117
Total Analysis Volume [veh/h]	48	361	0	0	729	194	0	0	0	110	375	467
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	4	63	54	54		29	29	29
g / C, Green / Cycle	0.04	0.63	0.54	0.54		0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.16	0.17		0.14	0.13	0.26
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	81	3570	2056	974		529	558	529
d1, Uniform Delay [s]	46.84	7.46	12.57	12.70		28.86	28.55	33.68
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	6.64	0.06	0.37	0.85		0.63	0.53	5.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.10	0.30	0.32		0.46	0.43	0.88
d, Delay for Lane Group [s/veh]	53.48	7.51	12.94	13.56		29.49	29.08	38.75
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.32	0.98	3.72	3.89		4.83	4.69	11.30
50th-Percentile Queue Length [ft/ln]	32.91	24.55	93.08	97.15		120.79	117.13	282.43
95th-Percentile Queue Length [veh/ln]	2.37	1.77	6.70	6.99		8.44	8.24	16.81
95th-Percentile Queue Length [ft/ln]	59.25	44.20	167.54	174.87		210.91	205.88	420.23

**Movement, Approach, & Intersection Results**

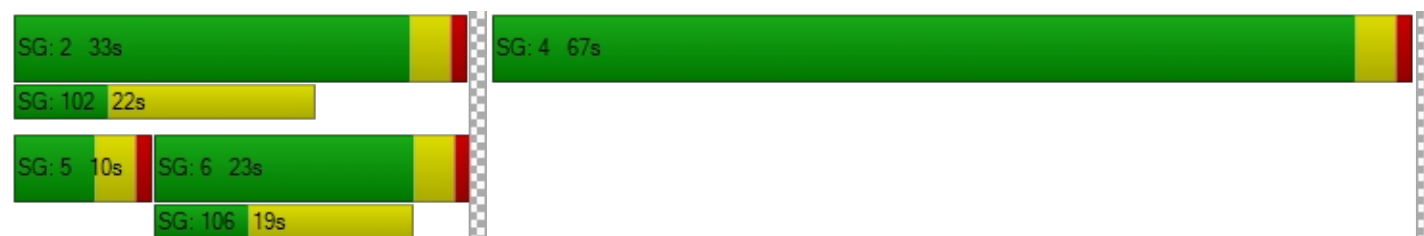
d_M, Delay for Movement [s/veh]	53.48	7.51	0.00	0.00	13.04	13.56	0.00	0.00	0.00	29.49	29.23	38.75
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	12.91			13.15			0.00			33.93		
Approach LOS	B			B			A			C		
d_I, Intersection Delay [s/veh]	21.77											
Intersection LOS	C											
Intersection V/C	0.519											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	2.020	2.254
Crosswalk LOS	F	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	380	0	1260
d_b, Bicycle Delay [s]	25.21	32.81	50.00	6.85
I_b,int, Bicycle LOS Score for Intersection	1.785	2.067	4.132	2.345
Bicycle LOS	A	B	D	B

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	574	174	321	744	0	469	137	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	574	174	321	744	0	469	137	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	144	44	80	186	0	117	34	37	0	0	0
Total Analysis Volume [veh/h]	0	574	174	321	744	0	469	137	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	25	54	0	0	46	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	59	59	12	75	17	17	17	
g / C, Green / Cycle	0.59	0.59	0.12	0.75	0.17	0.17	0.17	
(v / s)_i Volume / Saturation Flow Rate	0.10	0.10	0.09	0.13	0.13	0.07	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3387	1070	407	4277	594	322	305	
d1, Uniform Delay [s]	9.16	9.12	43.00	3.58	39.81	37.16	37.54	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.11	0.33	3.46	0.09	2.40	0.89	1.18	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.17	0.16	0.79	0.17	0.79	0.43	0.48	
d, Delay for Lane Group [s/veh]	9.27	9.44	46.46	3.67	42.22	38.05	38.72	
Lane Group LOS	A	A	D	A	D	D	D	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.82	1.71	4.02	1.19	5.66	3.06	3.33	
50th-Percentile Queue Length [ft/ln]	45.43	42.79	100.62	29.74	141.60	76.50	83.27	
95th-Percentile Queue Length [veh/ln]	3.27	3.08	7.24	2.14	9.57	5.51	6.00	
95th-Percentile Queue Length [ft/ln]	81.77	77.02	181.12	53.54	239.17	137.69	149.89	

**Movement, Approach, & Intersection Results**

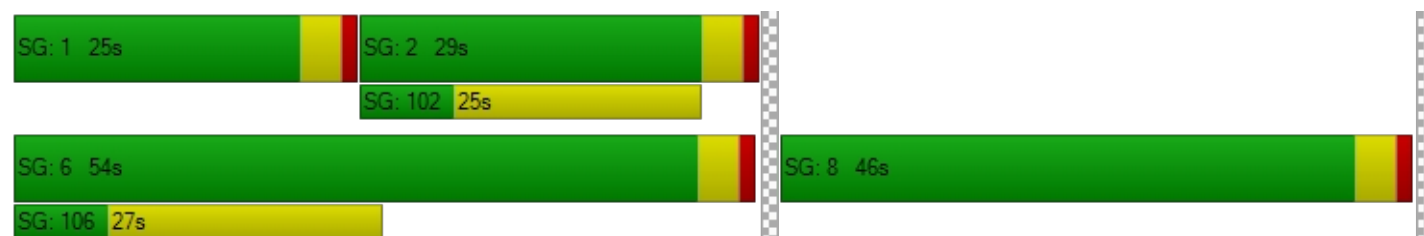
d_M, Delay for Movement [s/veh]	0.00	9.27	9.44	46.46	3.67	0.00	42.22	38.05	38.72	0.00	0.00	0.00
Movement LOS		A	A	D	A		D	D	D			
d_A, Approach Delay [s/veh]	9.31			16.57			40.77			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	21.56											
Intersection LOS	C											
Intersection V/C	0.371											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.319			2.028		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1000			840			0		
d_b, Bicycle Delay [s]	28.13			12.50			16.82			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.971			2.145			2.802			4.132		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.440

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	296	187	385	462	0	121	497	38	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	296	187	385	462	0	121	497	38	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	74	47	96	116	0	30	124	10	0	0	0
Total Analysis Volume [veh/h]	0	296	187	385	462	0	121	497	38	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	18	41	0	0	59	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	55	55	13	72	20	20	20	
g / C, Green / Cycle	0.55	0.55	0.13	0.72	0.20	0.20	0.20	
(v / s)_i Volume / Saturation Flow Rate	0.08	0.10	0.11	0.12	0.17	0.16	0.02	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	2080	985	454	2725	365	386	365	
d1, Uniform Delay [s]	11.11	11.43	42.56	4.56	38.44	37.85	32.45	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.14	0.43	4.51	0.13	5.79	3.69	0.12	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.14	0.19	0.85	0.17	0.86	0.79	0.10	
d, Delay for Lane Group [s/veh]	11.25	11.86	47.07	4.69	44.22	41.54	32.57	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.60	2.14	4.89	1.36	7.87	7.40	0.76	
50th-Percentile Queue Length [ft/ln]	39.89	53.44	122.27	33.99	196.78	185.10	19.00	
95th-Percentile Queue Length [veh/ln]	2.87	3.85	8.52	2.45	12.47	11.87	1.37	
95th-Percentile Queue Length [ft/ln]	71.80	96.19	212.94	61.18	311.80	296.66	34.20	

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	11.25	11.86	47.07	4.69	0.00	44.22	42.57	32.57	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	11.49			23.95			42.30			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	26.98											
Intersection LOS	C											
Intersection V/C	0.440											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.158			2.241		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			740			1100			0		
d_b, Bicycle Delay [s]	32.81			19.85			10.13			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.825			2.258			2.101			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	21	337	6	2	214
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	21	337	6	2	214
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	5	84	2	1	54
Total Analysis Volume [veh/h]	0	21	337	6	2	214
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0





**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	10.26	0.00	0.00	7.97	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.09	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.30	0.00	0.00	0.12	0.00
d_A, Approach Delay [s/veh]	10.26		0.00		0.07	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.40					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.240

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	354	12	26	368	0	124	2	193	103	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	354	12	26	368	0	124	2	193	103	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	89	3	7	92	0	31	1	48	26	0	8
Total Analysis Volume [veh/h]	0	354	12	26	368	0	124	2	193	103	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	53	0	10	63	0	0	47	0	47	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	80	80	88	88	14	14	14	14
g / C, Green / Cycle	0.73	0.73	0.80	0.80	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.10	0.10	0.01	0.10	0.07	0.11	0.06	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1387	1314	1466	3029	269	267	81	234
d1, Uniform Delay [s]	4.44	4.47	2.30	2.51	44.68	46.65	43.56	42.38
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.22	0.00	0.08	1.23	3.82	141.11	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.13	0.14	0.02	0.12	0.46	0.73	1.27	0.14
d, Delay for Lane Group [s/veh]	4.64	4.69	2.30	2.59	45.91	50.47	184.67	42.65
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.16	1.17	0.09	0.71	3.25	5.46	5.19	0.81
50th-Percentile Queue Length [ft/ln]	29.00	29.28	2.23	17.75	81.17	136.61	129.73	20.35
95th-Percentile Queue Length [veh/ln]	2.09	2.11	0.16	1.28	5.84	9.30	9.34	1.47
95th-Percentile Queue Length [ft/ln]	52.20	52.71	4.02	31.94	146.11	232.45	233.52	36.63

**Movement, Approach, & Intersection Results**

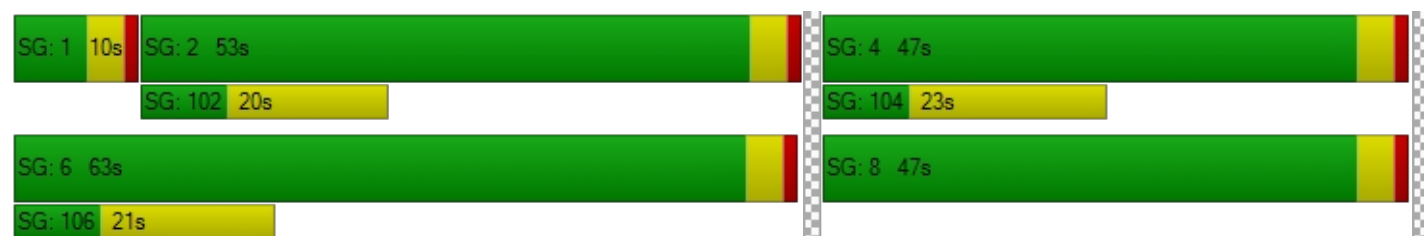
d_M, Delay for Movement [s/veh]	0.00	4.66	4.69	2.30	2.59	0.00	45.91	50.47	50.47	184.67	0.00	42.65
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	4.66			2.57			48.70			150.21		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	31.84											
Intersection LOS	C											
Intersection V/C	0.240											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.662			1.880			2.035		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			782			0		
d_b, Bicycle Delay [s]	16.91			11.82			20.40			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.862			1.885			2.086			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	5	179	217	0	9	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	179	217	0	9	1
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	45	54	0	2	0
Total Analysis Volume [veh/h]	5	179	217	0	9	1
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.67	0.00	0.00	0.00	10.11	9.44
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft/ln]	0.28	0.00	0.00	0.00	1.05	1.05
d_A, Approach Delay [s/veh]	0.21		0.00		10.05	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.34					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.034

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	10	179	222	0	0	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	179	222	0	0	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	45	56	0	0	7
Total Analysis Volume [veh/h]	10	179	222	0	0	28
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.03
d_M, Delay for Movement [s/veh]	7.69	0.00	0.00	0.00	10.26	9.56
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.11	0.11
95th-Percentile Queue Length [ft/ln]	0.56	0.00	0.00	0.00	2.66	2.66
d_A, Approach Delay [s/veh]	0.41		0.00		9.56	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.78					
Intersection LOS	A					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	158	11	40	211	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	158	11	40	211	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	3	10	53	4	7
Total Analysis Volume [veh/h]	158	11	40	211	17	27
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.63	0.00	10.67	9.36
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.09	0.00	0.18	0.18
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.19	0.00	4.45	4.45
d_A, Approach Delay [s/veh]	0.00		1.22		9.87	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.59					
Intersection LOS	B					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.220

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	76	372	19	0	264	21	0	0	126	0	0	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	372	19	0	264	21	0	0	126	0	0	179
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	93	5	0	66	5	0	0	32	0	0	45
Total Analysis Volume [veh/h]	76	372	19	0	264	21	0	0	126	0	0	179
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.22
d_M, Delay for Movement [s/veh]	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.78	0.00	0.00	10.67
Movement LOS	A	A	A		A	A			A			B
95th-Percentile Queue Length [veh/ln]	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.84
95th-Percentile Queue Length [ft/ln]	4.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.48	0.00	0.00	20.96
d_A, Approach Delay [s/veh]	1.30			0.00			9.78			10.67		
Approach LOS	A			A			A			B		
d_I, Intersection Delay [s/veh]	3.55											
Intersection LOS	B											





*APPENDIX O-III*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
FRIDAY ARRIVAL PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	167	993	132	306	881	292	158	977	159	131	1023	318
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	167	993	132	306	881	292	158	977	159	131	1023	318
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	248	33	77	220	73	40	244	40	33	256	80
Total Analysis Volume [veh/h]	167	993	132	306	881	292	158	977	159	131	1023	318
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	42	0	13	43	0	13	45	0	10	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	51	51	9	53	53	9	27	27	7	25	25
g / C, Green / Cycle	0.07	0.46	0.46	0.08	0.48	0.48	0.08	0.24	0.24	0.07	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.17	0.07	0.09	0.21	0.21	0.09	0.20	0.21	0.04	0.18	0.18
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	230	2636	832	289	1821	863	148	924	438	233	1295	409
d1, Uniform Delay [s]	50.46	19.26	17.16	50.51	18.93	18.79	50.51	39.45	39.77	49.84	40.07	39.93
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.13	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.32	0.41	0.41	42.18	0.78	1.56	52.67	1.94	5.75	2.13	1.12	3.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.73	0.38	0.16	1.06	0.44	0.43	1.06	0.83	0.85	0.56	0.79	0.78
d, Delay for Lane Group [s/veh]	54.78	19.67	17.57	92.69	19.71	20.35	103.18	41.39	45.52	51.97	41.18	43.15
Lane Group LOS	D	B	B	F	B	C	F	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.39	5.52	2.02	5.65	6.82	6.44	6.25	9.92	10.23	1.81	8.75	8.38
50th-Percentile Queue Length [ft/ln]	59.76	138.04	50.52	141.30	170.47	160.91	156.16	247.98	255.80	45.37	218.87	209.45
95th-Percentile Queue Length [veh/ln]	4.30	9.38	3.64	9.74	11.10	10.60	10.57	15.08	15.48	3.27	13.61	13.12
95th-Percentile Queue Length [ft/ln]	107.57	234.38	90.93	243.50	277.53	264.92	264.19	377.11	386.95	81.67	340.18	328.12

**Movement, Approach, & Intersection Results**

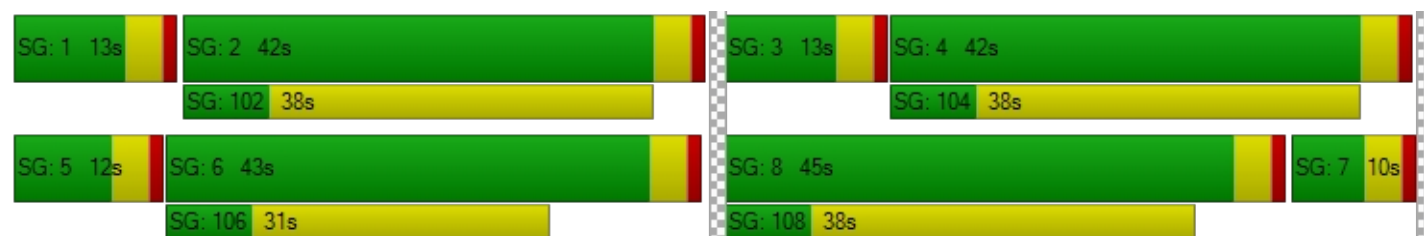
d_M, Delay for Movement [s/veh]	54.78	19.67	17.57	92.69	19.76	20.35	103.18	42.30	45.52	51.97	41.18	43.15
Movement LOS	D	B	B	F	B	C	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	23.99			34.97			50.13			42.57		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.97											
Intersection LOS	D											
Intersection V/C	0.619											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.126			3.094			2.990			3.172		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			709			745			691		
d_b, Bicycle Delay [s]	23.56			22.91			21.64			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.270			2.373			2.271			2.369		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**





Control Type:  
Analysis Method:  
Analysis Period:

Signalized  
HCM 6th Edition  
15 minutes

Delay (sec / veh):  
Level Of Service:  
Volume to Capacity (v/c):

27.8  
C  
0.579

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	28	1118	649	94	1020	28	77	128	29	567	76	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1118	649	94	1020	28	77	128	29	567	76	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	280	162	24	255	7	19	32	7	142	19	0
Total Analysis Volume [veh/h]	28	1118	649	94	1020	28	77	128	29	567	76	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	10	28	0	13	31	0	0	10	0	0	59	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	54	7	58	58	10	10	10	23	23
g / C, Green / Cycle	0.03	0.49	0.07	0.53	0.53	0.09	0.09	0.09	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.05	0.22	0.11	0.04	0.07	0.02	0.18	0.18
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	58	2804	120	2000	947	161	170	161	372	372
d1, Uniform Delay [s]	52.36	17.68	50.59	15.88	13.94	47.70	48.96	46.41	42.12	42.22
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.00	0.43	10.54	0.65	0.52	2.21	6.66	0.53	5.85	6.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.48	0.40	0.78	0.42	0.22	0.48	0.75	0.18	0.86	0.87
d, Delay for Lane Group [s/veh]	58.36	18.10	61.13	16.53	14.47	49.91	55.62	46.94	47.97	48.44
Lane Group LOS	E	B	E	B	B	D	E	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.86	5.96	2.90	6.45	2.81	2.11	3.74	0.76	8.92	9.06
50th-Percentile Queue Length [ft/ln]	21.42	149.00	72.41	161.17	70.35	52.67	93.51	18.99	222.96	226.52
95th-Percentile Queue Length [veh/ln]	1.54	9.96	5.21	10.61	5.07	3.79	6.73	1.37	13.82	14.00
95th-Percentile Queue Length [ft/ln]	38.56	249.10	130.33	265.27	126.63	94.81	168.31	34.18	345.40	349.94

**Movement, Approach, & Intersection Results**

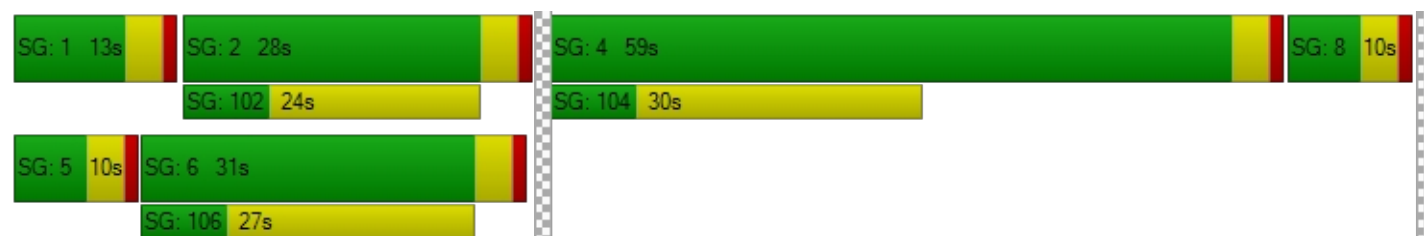
d_M, Delay for Movement [s/veh]	58.36	18.10	0.00	61.13	16.17	14.47	49.91	55.62	46.94	48.18	48.44	0.00
Movement LOS	E	B		E	B	B	D	E	D	D	D	
d_A, Approach Delay [s/veh]	19.09			19.83			52.66			48.21		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	27.75											
Intersection LOS	C											
Intersection V/C	0.579											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.929			2.230			2.231		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	436			491			109			1000		
d_b, Bicycle Delay [s]	33.62			31.31			49.16			13.75		
I_b,int, Bicycle LOS Score for Intersection	2.190			2.188			1.946			2.621		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.747

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	75	1308	32	364	1141	17	37	113	83	57	135	426
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	1308	32	364	1141	17	37	113	83	57	135	426
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	327	8	91	285	4	9	28	21	14	34	107
Total Analysis Volume [veh/h]	75	1308	32	364	1141	17	37	113	83	57	135	426
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	40	53	0	20	33	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	6	58	58	16	68	68	24	24	24	24	24	44
g / C, Green / Cycle	0.05	0.53	0.53	0.15	0.62	0.62	0.22	0.22	0.22	0.22	0.22	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.36	0.36	0.10	0.30	0.01	0.02	0.06	0.05	0.03	0.07	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	100	1005	952	513	2355	1115	312	410	388	330	410	717
d1, Uniform Delay [s]	51.15	19.17	19.10	44.69	11.36	8.03	34.53	35.96	35.46	34.93	36.41	26.06
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.35
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.60	3.83	3.96	1.83	0.72	0.02	0.17	0.36	0.27	0.25	0.47	2.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.75	0.69	0.68	0.71	0.48	0.02	0.12	0.28	0.21	0.17	0.33	0.59
d, Delay for Lane Group [s/veh]	61.75	23.01	23.06	46.52	12.08	8.05	34.70	36.33	35.73	35.18	36.88	28.62
Lane Group LOS	E	C	C	D	B	A	C	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.33	13.55	12.75	4.84	7.35	0.16	0.81	2.57	1.86	1.26	3.11	9.15
50th-Percentile Queue Length [ft/ln]	58.20	338.82	318.64	121.08	183.83	3.94	20.25	64.29	46.55	31.56	77.84	228.86
95th-Percentile Queue Length [veh/ln]	4.19	19.59	18.60	8.45	11.80	0.28	1.46	4.63	3.35	2.27	5.60	14.12
95th-Percentile Queue Length [ft/ln]	104.77	489.76	465.01	211.32	295.01	7.09	36.46	115.71	83.79	56.80	140.11	352.91

**Movement, Approach, & Intersection Results**

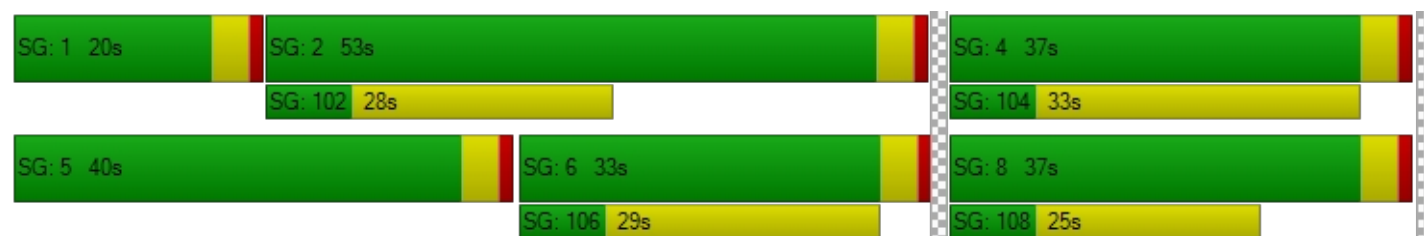
d_M, Delay for Movement [s/veh]	61.75	23.03	23.06	46.52	12.08	8.05	34.70	36.33	35.73	35.18	36.88	28.62
Movement LOS	E	C	C	D	B	A	C	D	D	D	D	C
d_A, Approach Delay [s/veh]	25.08			20.27			35.86			31.03		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	24.78											
Intersection LOS	C											
Intersection V/C	0.747											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.916			3.115			2.253			2.529		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			527			600			600		
d_b, Bicycle Delay [s]	16.91			29.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.727			2.815			1.944			2.579		
Bicycle LOS	B			C			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 4: Lemon Street at Berkeley Avenue

Control Type:	Signalized	Delay (sec / veh):	51.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.525

#### Intersection Setup

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	253	277	168	63	249	23	106	309	10	143	322	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	277	168	63	249	23	106	309	10	143	322	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	69	42	16	62	6	27	77	3	36	81	18
Total Analysis Volume [veh/h]	253	277	168	63	249	23	106	309	10	143	322	70
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	31	0	0	30	0	0	49	49	0	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	39	39	39	39	39	20	20	63	20	20	20
g / C, Green / Cycle	0.35	0.35	0.35	0.35	0.35	0.18	0.18	0.57	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.09	0.04	0.15	0.06	0.16	0.01	0.08	0.11	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	637	637	637	637	637	202	348	1032	100	348	329
d1, Uniform Delay [s]	26.66	27.08	25.27	23.74	26.99	38.93	43.75	10.05	38.78	41.10	40.85
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.15	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.85	2.16	1.01	0.31	2.09	2.10	10.52	0.02	207.89	1.62	1.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.40	0.43	0.26	0.10	0.43	0.52	0.89	0.01	1.44	0.59	0.56
d, Delay for Lane Group [s/veh]	28.51	29.23	26.28	24.05	29.08	41.03	54.27	10.07	246.67	42.72	42.36
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	5.28	5.89	3.30	1.15	5.76	2.60	9.15	0.11	8.08	5.26	4.70
50th-Percentile Queue Length [ft/ln]	132.07	147.32	82.44	28.85	144.09	65.05	228.84	2.67	202.02	131.55	117.59
95th-Percentile Queue Length [veh/ln]	9.05	9.87	5.94	2.08	9.70	4.68	14.12	0.19	14.55	9.02	8.26
95th-Percentile Queue Length [ft/ln]	226.30	246.84	148.40	51.92	242.52	117.10	352.89	4.81	363.64	225.60	206.51

**Movement, Approach, & Intersection Results**

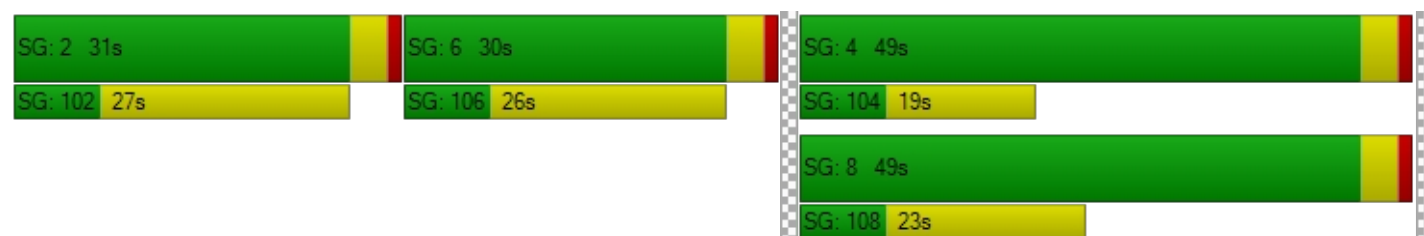
d_M, Delay for Movement [s/veh]	28.51	29.23	26.28	24.05	29.08	29.08	41.03	54.27	10.07	246.67	42.59	42.36
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	28.26			28.13			49.93			97.11		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	51.34											
Intersection LOS	D											
Intersection V/C	0.525											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.612			2.357			2.509			2.403		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			818			818		
d_b, Bicycle Delay [s]	31.31			32.07			19.20			19.20		
I_b,int, Bicycle LOS Score for Intersection	2.711			2.112			2.261			2.001		
Bicycle LOS	B			B			B			B		

**Sequence**




Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.336

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	17	177	137	235	405	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	177	137	235	405	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	44	34	59	101	7
Total Analysis Volume [veh/h]	17	177	137	235	405	29
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	72	0	0	38	38	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	89	89	89	89
g / C, Green / Cycle	0.12	0.12	0.81	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.08	0.12	0.21	0.02
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	213	213	1382	1537	1537	1456
d1, Uniform Delay [s]	43.10	47.35	2.17	2.29	2.55	2.04
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	8.13	0.14	0.21	0.42	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.83	0.10	0.15	0.26	0.02
d, Delay for Lane Group [s/veh]	43.26	55.48	2.31	2.50	2.97	2.06
Lane Group LOS	D	E	A	A	A	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.42	5.20	0.49	0.88	1.70	0.10
50th-Percentile Queue Length [ft/ln]	10.54	129.96	12.33	22.07	42.50	2.43
95th-Percentile Queue Length [veh/ln]	0.76	8.94	0.89	1.59	3.06	0.18
95th-Percentile Queue Length [ft/ln]	18.98	223.44	22.20	39.73	76.50	4.38

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	43.26	55.48	2.31	2.50	2.97	2.06
Movement LOS	D	E	A	A	A	A
d_A, Approach Delay [s/veh]	54.41		2.43		2.91	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	12.72					
Intersection LOS	B					
Intersection V/C	0.336					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.262	2.260	2.173
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.746	4.849
Bicycle LOS	D	E	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 72s

SG: 101 26s

SG: 4 38s



SG: 104 21s

SG: 8 38s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.857

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	222	1226	173	191	888	23	42	592	169	197	792	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	222	1226	173	191	888	23	42	592	169	197	792	201
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	307	43	48	222	6	11	148	42	49	198	50
Total Analysis Volume [veh/h]	222	1226	173	191	888	23	42	592	169	197	792	201
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	34	0	10	33	0	10	55	0	11	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	59	49	49	59	48	48	43	32	32	43	34	34
g / C, Green / Cycle	0.54	0.45	0.45	0.54	0.44	0.44	0.39	0.29	0.29	0.39	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.12	0.38	0.37	0.11	0.25	0.25	0.02	0.21	0.20	0.11	0.28	0.26
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	724	850	805	436	833	789	321	547	518	449	592	561
d1, Uniform Delay [s]	13.35	27.25	26.84	13.09	23.08	23.01	21.08	35.52	34.80	23.12	36.10	35.19
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.15	0.12
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	10.77	9.95	0.69	2.76	2.85	0.18	2.01	1.62	0.68	6.47	3.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.31	0.86	0.83	0.44	0.56	0.56	0.13	0.74	0.69	0.44	0.89	0.83
d, Delay for Lane Group [s/veh]	14.44	38.02	36.78	13.78	25.84	25.87	21.27	37.53	36.43	23.80	42.57	38.76
Lane Group LOS	B	D	D	B	C	C	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.05	19.01	17.21	2.48	9.54	8.96	0.70	10.05	8.60	3.59	14.32	11.97
50th-Percentile Queue Length [ft/ln]	76.35	475.27	430.32	61.88	238.48	223.94	17.43	251.34	215.07	89.67	357.97	299.26
95th-Percentile Queue Length [veh/ln]	5.50	26.16	24.02	4.46	14.60	13.87	1.25	15.25	13.41	6.46	20.52	17.64
95th-Percentile Queue Length [ft/ln]	137.44	654.04	600.42	111.38	365.11	346.64	31.37	381.34	335.33	161.40	513.12	441.11

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	14.44	37.51	36.78	13.78	25.86	25.87	21.27	37.18	36.43	23.80	41.30	38.76
Movement LOS	B	D	D	B	C	C	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	34.28			23.76			36.19			37.97		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.08											
Intersection LOS	C											
Intersection V/C	0.857											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.956			2.830			2.813			2.855		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			527			927			945		
d_b, Bicycle Delay [s]	29.09			29.82			15.82			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.897			2.469			2.222			2.541		
Bicycle LOS	C			B			B			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	32.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	125	1003	222	135	915	143	221	793	147	227	914	184
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	1003	222	135	915	143	221	793	147	227	914	184
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	251	56	34	229	36	55	198	37	57	229	46
Total Analysis Volume [veh/h]	125	1003	222	135	915	143	221	793	147	227	914	184
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	32	0	10	32	0	13	58	0	10	55	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	58	48	48	58	48	48	44	34	34	44	31	31
g / C, Green / Cycle	0.53	0.44	0.44	0.53	0.44	0.44	0.40	0.31	0.31	0.40	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.32	0.08	0.29	0.28	0.12	0.26	0.25	0.13	0.24	0.10
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	612	827	783	507	829	785	411	587	556	380	1071	507
d1, Uniform Delay [s]	13.25	26.63	25.90	13.33	24.74	24.28	22.54	35.56	34.91	22.63	37.38	31.62
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.12	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.75	7.26	6.19	0.28	4.30	3.98	1.10	3.76	2.70	1.50	2.05	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.20	0.78	0.74	0.27	0.67	0.64	0.54	0.84	0.80	0.60	0.85	0.36
d, Delay for Lane Group [s/veh]	14.01	33.89	32.09	13.61	29.03	28.26	23.64	39.32	37.61	24.13	39.43	32.06
Lane Group LOS	B	C	C	B	C	C	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.68	15.73	13.60	1.73	12.24	10.85	4.02	12.84	11.19	4.17	11.78	3.97
50th-Percentile Queue Length [ft/ln]	42.05	393.21	339.98	43.19	305.93	271.28	100.46	321.10	279.64	104.32	294.59	99.28
95th-Percentile Queue Length [veh/ln]	3.03	22.23	19.65	3.11	17.97	16.25	7.23	18.72	16.67	7.51	17.41	7.15
95th-Percentile Queue Length [ft/ln]	75.70	555.82	491.18	77.75	449.35	406.34	180.83	468.04	416.77	187.78	435.33	178.70

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	14.01	33.25	32.09	13.61	28.73	28.26	23.64	38.68	37.61	24.13	39.43	32.06
Movement LOS	B	C	C	B	C	C	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	31.28			26.96			35.68			35.79		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.46											
Intersection LOS	C											
Intersection V/C	0.850											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.930			2.911			2.847			2.952		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			509			982			927		
d_b, Bicycle Delay [s]	30.56			30.56			14.25			15.82		
I_b,int, Bicycle LOS Score for Intersection	2.673			2.544			2.517			2.653		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	35.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	115	615	210	69	414	144	321	676	131	183	1035	177
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	615	210	69	414	144	321	676	131	183	1035	177
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	154	53	17	104	36	80	169	33	46	259	44
Total Analysis Volume [veh/h]	115	615	210	69	414	144	321	676	131	183	1035	177
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	32	0	10	31	0	37	53	0	15	31	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	34	34	43	32	32	22	47	47	8	33	33
g / C, Green / Cycle	0.39	0.31	0.31	0.39	0.29	0.29	0.20	0.43	0.43	0.07	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.12	0.04	0.16	0.14	0.18	0.22	0.21	0.05	0.27	0.10
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	558	1157	548	552	559	529	357	817	774	249	1151	545
d1, Uniform Delay [s]	21.91	31.77	30.15	21.33	32.53	32.06	43.04	23.05	22.68	50.10	36.77	29.67
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.16	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.84	1.75	2.03	0.10	3.62	3.24	11.17	0.52	0.49	4.15	2.84	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.21	0.53	0.38	0.13	0.53	0.49	0.90	0.52	0.49	0.73	0.90	0.32
d, Delay for Lane Group [s/veh]	22.75	33.53	32.18	21.43	36.15	35.30	54.21	23.56	23.17	54.26	39.60	30.01
Lane Group LOS	C	C	C	C	D	D	D	C	C	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.07	7.02	4.67	1.15	7.16	6.15	9.56	8.10	7.13	2.61	13.56	3.67
50th-Percentile Queue Length [ft/ln]	51.66	175.40	116.81	28.67	178.97	153.79	238.94	202.46	178.25	65.19	338.97	91.73
95th-Percentile Queue Length [veh/ln]	3.72	11.36	8.22	2.06	11.55	10.22	14.63	12.77	11.51	4.69	19.60	6.60
95th-Percentile Queue Length [ft/ln]	92.99	284.00	205.43	51.60	288.67	255.48	365.69	319.13	287.72	117.34	489.95	165.11

**Movement, Approach, & Intersection Results**

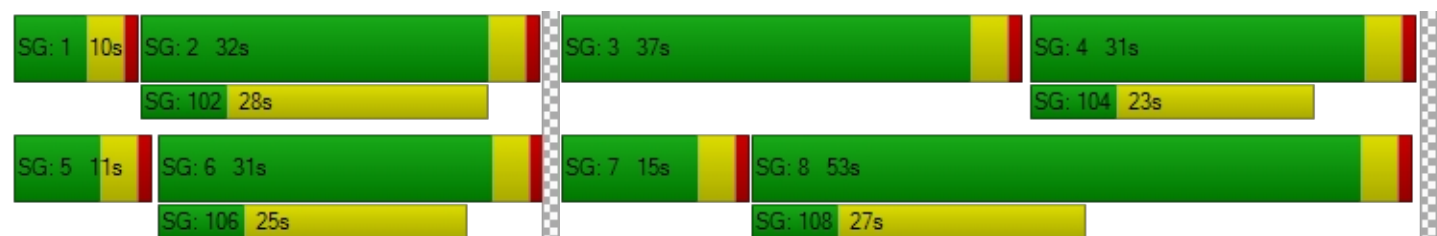
d_M, Delay for Movement [s/veh]	22.75	33.53	32.18	21.43	35.91	35.30	54.21	23.42	23.17	54.26	39.60	30.01
Movement LOS	C	C	C	C	D	D	D	C	C	D	D	C
d_A, Approach Delay [s/veh]	31.90			34.18			32.15			40.31		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	35.19											
Intersection LOS	D											
Intersection V/C	0.762											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.733			2.649			2.833			2.963		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			891			491		
d_b, Bicycle Delay [s]	30.56			31.31			16.91			31.31		
I_b,int, Bicycle LOS Score for Intersection	2.335			2.077			2.490			2.710		
Bicycle LOS	B			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	8	18	14	342	12	104	272	650	5	17	1237	805
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	18	14	342	12	104	272	650	5	17	1237	805
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	5	4	86	3	26	68	163	1	4	309	201
Total Analysis Volume [veh/h]	8	18	14	342	12	104	272	650	5	17	1237	805
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	23	33	0	10	77	0	0	67	67
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	19	27	75	75	75	63	63	86
g / C, Green / Cycle	0.04	0.04	0.04	0.17	0.25	0.68	0.68	0.68	0.57	0.57	0.78
(v / s)_i Volume / Saturation Flow Rate	0.00	0.01	0.01	0.10	0.06	0.15	0.18	0.18	0.01	0.33	0.45
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	73	69	605	446	957	1291	1223	945	2182	1410
d1, Uniform Delay [s]	51.08	51.34	51.25	41.72	33.28	6.65	6.87	6.86	10.07	14.78	4.67
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.12	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	1.72	1.41	0.83	0.31	0.18	0.49	0.52	0.03	1.07	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.12	0.25	0.20	0.57	0.26	0.28	0.26	0.26	0.02	0.57	0.57
d, Delay for Lane Group [s/veh]	51.90	53.05	52.66	42.55	33.58	6.84	7.36	7.38	10.10	15.86	6.35
Lane Group LOS	D	D	D	D	C	A	A	A	B	B	A
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.23	0.52	0.40	4.31	2.53	2.26	3.00	2.84	0.18	9.63	6.13
50th-Percentile Queue Length [ft/ln]	5.70	12.91	10.03	107.86	63.28	56.54	75.08	71.12	4.58	240.74	153.23
95th-Percentile Queue Length [veh/ln]	0.41	0.93	0.72	7.72	4.56	4.07	5.41	5.12	0.33	14.72	10.19
95th-Percentile Queue Length [ft/ln]	10.26	23.24	18.05	193.02	113.90	101.78	135.15	128.02	8.25	367.97	254.74

**Movement, Approach, & Intersection Results**

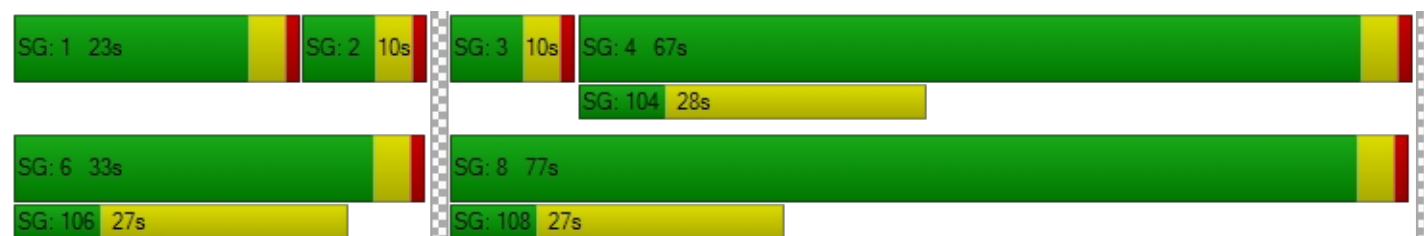
d_M, Delay for Movement [s/veh]	51.90	53.05	52.66	42.55	33.58	33.58	6.84	7.37	7.38	10.10	15.86	6.35
Movement LOS	D	D	D	D	C	C	A	A	A	B	B	A
d_A, Approach Delay [s/veh]	52.68			40.28			7.21			12.09		
Approach LOS	D			D			A			B		
d_I, Intersection Delay [s/veh]	14.97											
Intersection LOS	B											
Intersection V/C	0.596											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.183			2.748			2.765			0.000		
Crosswalk LOS	B			B			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			527			1327			1145		
d_b, Bicycle Delay [s]	49.16			29.82			6.22			10.04		
I_b,int, Bicycle LOS Score for Intersection	1.626			2.315			2.324			3.258		
Bicycle LOS	A			B			B			C		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	414	184	184	64	116	46	59	826	156	123	1626	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	414	184	184	64	116	46	59	826	156	123	1626	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	46	46	16	29	12	15	207	39	31	407	21
Total Analysis Volume [veh/h]	414	184	184	64	116	46	59	826	156	123	1626	82
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	43	0	10	30	0	10	45	0	12	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	30	21	21	30	7	7	72	62	62	72	63	63
g / C, Green / Cycle	0.28	0.19	0.19	0.28	0.07	0.07	0.65	0.56	0.56	0.65	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.23	0.10	0.10	0.04	0.04	0.04	0.03	0.27	0.26	0.07	0.46	0.46
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	521	364	345	440	126	119	581	1067	1011	961	1081	1024
d1, Uniform Delay [s]	37.52	39.84	40.08	29.95	50.24	50.14	6.90	14.56	14.26	7.17	19.02	18.96
k, delay calibration	0.19	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.90	1.09	1.28	0.15	6.12	5.74	0.08	1.58	1.50	0.28	6.69	6.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.79	0.51	0.53	0.15	0.67	0.65	0.10	0.49	0.46	0.13	0.81	0.81
d, Delay for Lane Group [s/veh]	42.41	40.93	41.36	30.10	56.36	55.87	6.98	16.14	15.76	7.44	25.71	25.87
Lane Group LOS	D	D	D	C	E	E	A	B	B	A	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	11.07	4.56	4.60	1.30	2.50	2.26	0.48	7.95	6.98	1.10	18.79	17.75
50th-Percentile Queue Length [ft/ln]	276.80	113.94	114.93	32.44	62.39	56.45	12.12	198.81	174.44	27.41	469.76	443.76
95th-Percentile Queue Length [veh/ln]	16.53	8.06	8.11	2.34	4.49	4.06	0.87	12.58	11.31	1.97	25.90	24.66
95th-Percentile Queue Length [ft/ln]	413.22	201.47	202.84	58.38	112.30	101.60	21.82	314.43	282.75	49.34	647.49	616.50

**Movement, Approach, & Intersection Results**

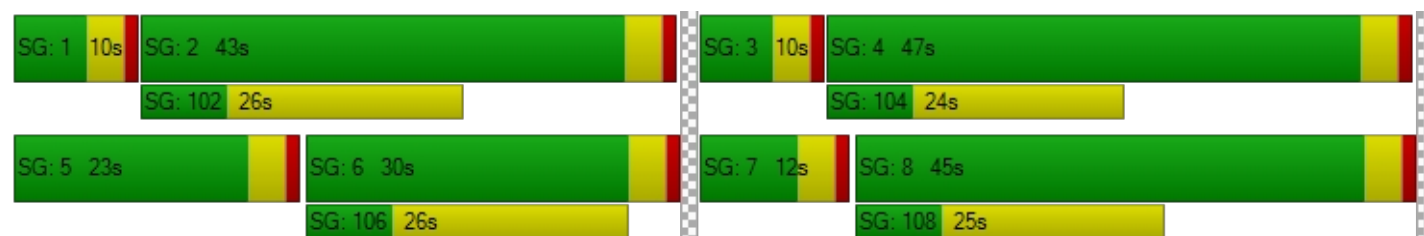
d_M, Delay for Movement [s/veh]	42.41	40.93	41.36	30.10	56.23	55.87	6.98	16.00	15.76	7.44	25.78	25.87
Movement LOS	D	D	D	C	E	E	A	B	B	A	C	C
d_A, Approach Delay [s/veh]	41.82			48.76			15.45			24.55		
Approach LOS	D			D			B			C		
d_I, Intersection Delay [s/veh]	27.00											
Intersection LOS	C											
Intersection V/C	0.854											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.640			2.324			2.972			2.895		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			473			745			782		
d_b, Bicycle Delay [s]	22.91			32.07			21.64			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.850			1.746			2.418			3.070		
Bicycle LOS	C			A			B			C		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	13.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	90	66	79	34	46	35	30	957	36	74	1691	48
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	66	79	34	46	35	30	957	36	74	1691	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	17	20	9	12	9	8	239	9	19	423	12
Total Analysis Volume [veh/h]	90	66	79	34	46	35	30	957	36	74	1691	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	69	0	0	69	0	16	31	0	10	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	7	7	7	85	85	85	87	87	87
g / C, Green / Cycle	0.07	0.07	0.07	0.07	0.07	0.78	0.78	0.78	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.05	0.02	0.27	0.27	0.04	0.47	0.47
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	77	127	120	96	120	1052	1473	1395	1366	1503	1424
d1, Uniform Delay [s]	50.02	49.61	50.08	48.80	50.14	2.83	3.81	3.79	2.50	4.53	4.52
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	102.72	3.25	5.92	2.23	6.35	0.05	0.65	0.67	0.08	1.74	1.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.17	0.52	0.66	0.36	0.67	0.03	0.35	0.34	0.05	0.59	0.59
d, Delay for Lane Group [s/veh]	152.74	52.86	56.00	51.04	56.49	2.88	4.46	4.47	2.58	6.27	6.35
Lane Group LOS	F	D	E	D	E	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.25	1.87	2.32	0.95	2.39	0.14	3.05	2.85	0.30	6.59	6.25
50th-Percentile Queue Length [ft/ln]	106.35	46.72	57.94	23.71	59.70	3.39	76.31	71.34	7.41	164.67	156.17
95th-Percentile Queue Length [veh/ln]	7.66	3.36	4.17	1.71	4.30	0.24	5.49	5.14	0.53	10.80	10.35
95th-Percentile Queue Length [ft/ln]	191.42	84.09	104.30	42.67	107.47	6.10	137.37	128.42	13.34	269.89	258.64

**Movement, Approach, & Intersection Results**

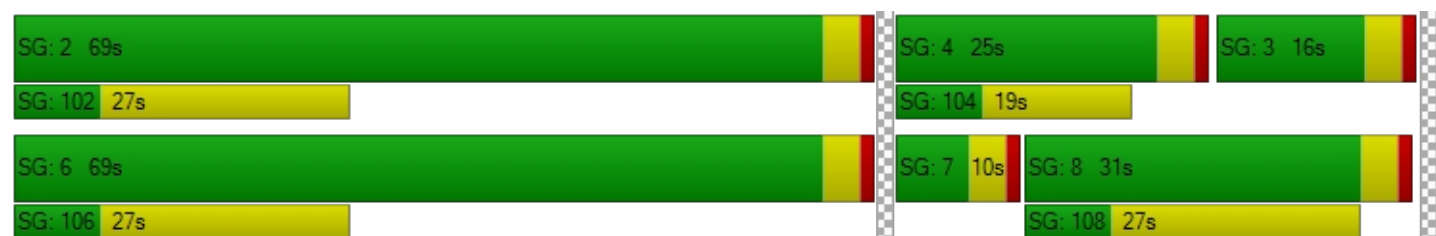
d_M, Delay for Movement [s/veh]	152.74	52.86	56.00	51.04	56.49	56.49	2.88	4.47	4.47	2.58	6.31	6.35
Movement LOS	F	D	E	D	E	E	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	92.17			54.88			4.42			6.15		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	13.70											
Intersection LOS	B											
Intersection V/C	0.586											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.312			2.073			2.991			2.920		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1182			1182			491			382		
d_b, Bicycle Delay [s]	9.20			9.20			31.31			36.00		
I_b,int, Bicycle LOS Score for Intersection	1.947			1.749			2.404			3.055		
Bicycle LOS	A			A			B			C		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	45.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.887

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	212	551	102	192	579	396	306	698	104	176	1356	159
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	212	551	102	192	579	396	306	698	104	176	1356	159
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	138	26	48	145	99	77	175	26	44	339	40
Total Analysis Volume [veh/h]	212	551	102	192	579	396	306	698	104	176	1356	159
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	34	0	20	37	37	14	41	0	15	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	38	38	8	33	47	10	23	23	25	38	38
g / C, Green / Cycle	0.12	0.34	0.34	0.07	0.30	0.43	0.09	0.21	0.21	0.22	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.12	0.15	0.06	0.05	0.15	0.22	0.09	0.18	0.06	0.10	0.36	0.09
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	213	1311	621	261	1144	771	318	809	383	400	1308	620
d1, Uniform Delay [s]	48.48	27.61	25.02	49.85	31.69	23.03	49.81	41.76	36.18	36.87	36.07	25.95
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.31	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	27.75	0.99	0.57	4.03	1.60	1.51	15.81	2.90	0.38	0.76	22.67	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.00	0.42	0.16	0.74	0.51	0.51	0.96	0.86	0.27	0.44	1.04	0.26
d, Delay for Lane Group [s/veh]	76.22	28.60	25.59	53.88	33.29	24.55	65.61	44.66	36.56	37.63	58.74	26.17
Lane Group LOS	E	C	C	D	C	C	E	D	D	D	F	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.42	5.71	1.95	2.73	6.57	7.73	4.87	9.38	2.38	4.15	21.21	3.03
50th-Percentile Queue Length [ft/ln]	185.56	142.67	48.81	68.14	164.21	193.36	121.82	234.44	59.43	103.84	530.17	75.65
95th-Percentile Queue Length [veh/ln]	11.89	9.62	3.51	4.91	10.77	12.30	8.49	14.40	4.28	7.48	29.47	5.45
95th-Percentile Queue Length [ft/ln]	297.26	240.61	87.86	122.66	269.28	307.39	212.33	359.99	106.97	186.91	736.85	136.18

**Movement, Approach, & Intersection Results**

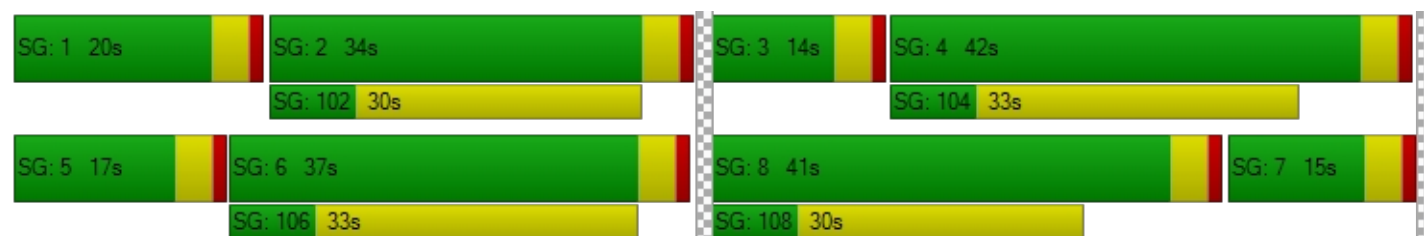
d_M, Delay for Movement [s/veh]	76.22	28.60	25.59	53.88	33.29	24.55	65.61	44.66	36.56	37.63	58.74	26.17
Movement LOS	E	C	C	D	C	C	E	D	D	D	F	C
d_A, Approach Delay [s/veh]	39.92			33.71			49.69			53.48		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	45.41											
Intersection LOS	D											
Intersection V/C	0.887											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.743			2.908			3.031			2.898		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			673			691		
d_b, Bicycle Delay [s]	29.09			26.95			24.22			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.273			2.522			2.474			2.955		
Bicycle LOS	B			B			B			C		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	90	0	307	0	816	395	302	1651	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	90	0	307	0	816	395	302	1651	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	23	0	77	0	204	99	76	413	0
Total Analysis Volume [veh/h]	0	0	0	90	0	307	0	816	395	302	1651	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	40	0	0	19	0	51	70	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		21	21	56	56	21	81
g / C, Green / Cycle		0.19	0.19	0.51	0.51	0.19	0.73
(v / s)_i Volume / Saturation Flow Rate		0.05	0.17	0.21	0.22	0.17	0.43
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		347	347	1937	918	339	2791
d1, Uniform Delay [s]		37.71	43.19	16.78	17.03	43.53	6.86
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.39	7.50	0.66	1.53	8.07	0.93
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.26	0.88	0.42	0.44	0.89	0.59
d, Delay for Lane Group [s/veh]		38.10	50.69	17.44	18.56	51.60	7.79
Lane Group LOS		D	D	B	B	D	A
Critical Lane Group		No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		2.10	8.78	6.38	6.68	8.71	8.00
50th-Percentile Queue Length [ft/ln]		52.52	219.56	159.45	167.11	217.78	199.89
95th-Percentile Queue Length [veh/ln]		3.78	13.64	10.52	10.92	13.55	12.63
95th-Percentile Queue Length [ft/ln]		94.53	341.06	262.99	273.11	338.80	315.82

**Movement, Approach, & Intersection Results**

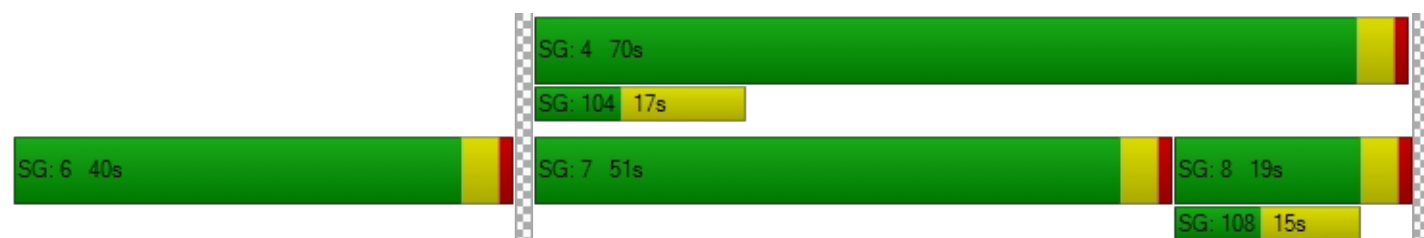
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	38.10	38.10	50.69	0.00	17.45	18.56	51.60	7.79	0.00
Movement LOS				D	D	D		B	B	D	A	
d_A, Approach Delay [s/veh]	0.00			47.84			17.82			14.56		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	19.38											
Intersection LOS	B											
Intersection V/C	0.679											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.113	1.918	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	655	273	1200
d_b, Bicycle Delay [s]	55.00	24.89	41.02	8.80
I_b,int, Bicycle LOS Score for Intersection	4.132	2.215	2.226	3.171
Bicycle LOS	D	B	B	C

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	29.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	859	0	468	0	0	0	164	749	0	0	1049	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	859	0	468	0	0	0	164	749	0	0	1049	181
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	215	0	117	0	0	0	41	187	0	0	262	45
Total Analysis Volume [veh/h]	859	0	468	0	0	0	164	749	0	0	1049	181
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	80	0	0	0	0	0	10	30	0	0	20	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	32	32	32		12	70	54	54
g / C, Green / Cycle	0.29	0.29	0.29		0.11	0.64	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.25	0.25	0.25		0.09	0.20	0.32	0.34
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	516	516	516		198	2434	939	889
d1, Uniform Delay [s]	37.10	37.10	37.10		47.89	8.84	20.81	21.38
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.25	4.25	4.25		8.43	0.33	3.56	4.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.86	0.86	0.86		0.83	0.31	0.66	0.69
d, Delay for Lane Group [s/veh]	41.35	41.35	41.35		56.33	9.17	24.38	25.78
Lane Group LOS	D	D	D		E	A	C	C
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	11.70	11.70	11.70		4.85	3.89	12.36	12.83
50th-Percentile Queue Length [ft/ln]	292.41	292.41	292.41		121.24	97.21	309.10	320.85
95th-Percentile Queue Length [veh/ln]	17.31	17.31	17.31		8.46	7.00	18.13	18.71
95th-Percentile Queue Length [ft/ln]	432.63	432.63	432.63		211.53	174.98	453.26	467.74

**Movement, Approach, & Intersection Results**

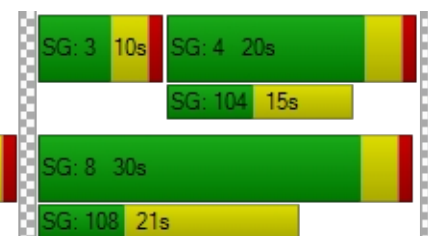
d_M, Delay for Movement [s/veh]	41.35	0.00	41.35	0.00	0.00	0.00	56.33	9.17	0.00	0.00	24.96	25.78
Movement LOS	D		D				E	A			C	C
d_A, Approach Delay [s/veh]	41.35			0.00			17.64			25.08		
Approach LOS	D			A			B			C		
d_I, Intersection Delay [s/veh]	29.34											
Intersection LOS	C											
Intersection V/C	0.762											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.381	1.769	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	473	291
d_b, Bicycle Delay [s]	55.00	55.00	32.07	40.16
I_b,int, Bicycle LOS Score for Intersection	6.322	4.132	2.313	2.574
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	5.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	32	957	17	7	671	23	13	26	26	19	18	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	957	17	7	671	23	13	26	26	19	18	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	239	4	2	168	6	3	7	7	5	5	6
Total Analysis Volume [veh/h]	32	957	17	7	671	23	13	26	26	19	18	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	23	0	0	23	0	0	87	0	0	87	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	97	97	97	97	97	97	5	5
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.02	0.26	0.26	0.00	0.19	0.19	0.04	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1554	1671	1583	1526	1671	1583	125	129
d1, Uniform Delay [s]	0.81	1.09	1.08	0.80	0.98	0.98	51.70	51.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.46	0.48	0.01	0.29	0.31	3.29	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.30	0.30	0.00	0.21	0.21	0.52	0.46
d, Delay for Lane Group [s/veh]	0.84	1.55	1.57	0.81	1.28	1.29	54.99	54.14
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.04	0.76	0.72	0.01	0.49	0.46	1.88	1.72
50th-Percentile Queue Length [ft/ln]	0.91	18.88	18.01	0.20	12.17	11.55	47.04	42.98
95th-Percentile Queue Length [veh/ln]	0.07	1.36	1.30	0.01	0.88	0.83	3.39	3.09
95th-Percentile Queue Length [ft/ln]	1.64	33.98	32.42	0.35	21.91	20.79	84.68	77.37

**Movement, Approach, & Intersection Results**

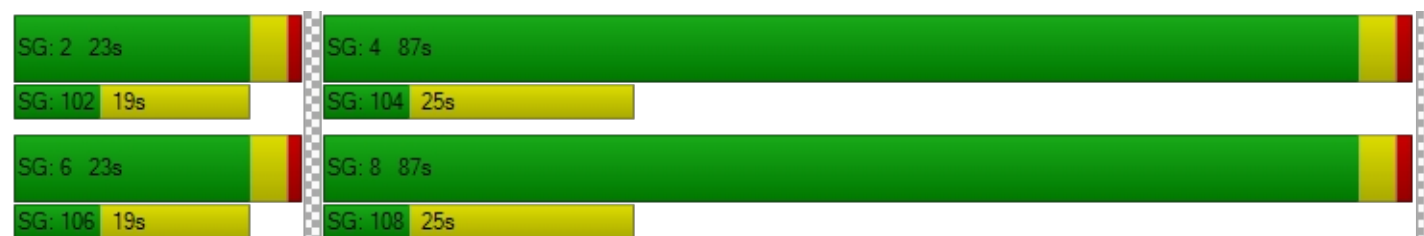
d_M, Delay for Movement [s/veh]	0.84	1.56	1.57	0.81	1.28	1.29	54.99	54.99	54.99	54.14	54.14	54.14
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.53			1.28			54.99			54.14		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	5.06											
Intersection LOS	A											
Intersection V/C	0.324											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.672			2.658			1.837			1.788		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	345			345			1509			1509		
d_b, Bicycle Delay [s]	37.64			37.64			3.31			3.31		
I_b,int, Bicycle LOS Score for Intersection	2.390			2.138			1.667			1.659		
Bicycle LOS	B			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	132	1147	188	88	1018	111	152	467	140	209	547	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	1147	188	88	1018	111	152	467	140	209	547	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	287	47	22	255	28	38	117	35	52	137	22
Total Analysis Volume [veh/h]	132	1147	188	88	1018	111	152	467	140	209	547	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	45	0	22	57	0	11	33	0	10	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	38	38	38	38	38	38	54	41	41	54	43	43
g / C, Green / Cycle	0.35	0.35	0.35	0.34	0.34	0.34	0.49	0.37	0.37	0.49	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.07	0.30	0.10	0.05	0.31	0.30	0.08	0.12	0.08	0.12	0.14	0.05
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	231	1317	624	223	651	617	795	1398	662	821	1479	701
d1, Uniform Delay [s]	25.34	33.64	26.22	25.01	34.47	33.97	15.45	25.06	23.83	16.01	23.98	21.56
k, delay calibration	0.11	0.11	0.11	0.11	0.20	0.19	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.22	1.92	0.27	1.13	8.76	6.82	0.12	0.64	0.73	0.75	0.71	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.57	0.87	0.30	0.39	0.91	0.88	0.19	0.33	0.21	0.25	0.37	0.12
d, Delay for Lane Group [s/veh]	27.57	35.56	26.49	26.13	43.24	40.79	15.57	25.70	24.56	16.75	24.69	21.92
Lane Group LOS	C	D	C	C	D	D	B	C	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.58	14.39	3.63	1.66	16.28	14.44	2.12	4.49	2.63	3.15	5.18	1.49
50th-Percentile Queue Length [ft/ln]	64.41	359.66	90.83	41.56	407.11	361.02	52.95	112.35	65.63	78.76	129.57	37.34
95th-Percentile Queue Length [veh/ln]	4.64	20.61	6.54	2.99	22.90	20.67	3.81	7.97	4.73	5.67	8.92	2.69
95th-Percentile Queue Length [ft/ln]	115.94	515.17	163.49	74.82	572.56	516.83	95.31	199.27	118.13	141.78	222.91	67.21

**Movement, Approach, & Intersection Results**

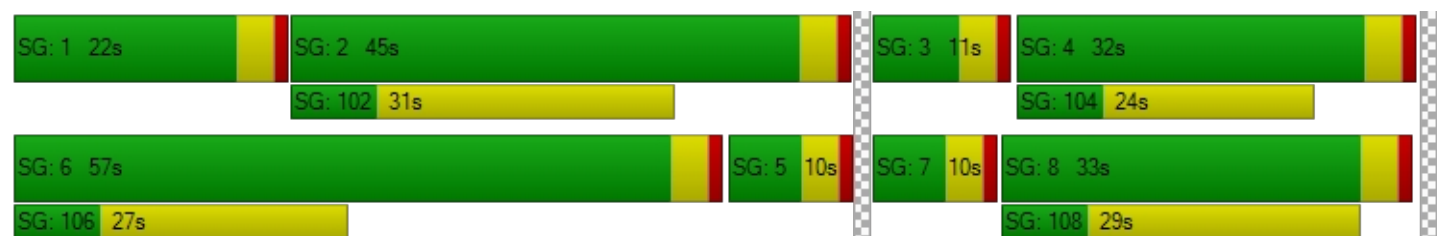
d_M, Delay for Movement [s/veh]	27.57	35.56	26.49	26.13	42.21	40.79	15.57	25.70	24.56	16.75	24.69	21.92
Movement LOS	C	D	C	C	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	33.68			40.92			23.46			22.44		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.72											
Intersection LOS	C											
Intersection V/C	0.633											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.038			2.905			2.807			2.754		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			964			527			509		
d_b, Bicycle Delay [s]	21.64			14.77			29.82			30.56		
I_b,int, Bicycle LOS Score for Intersection	2.770			2.564			2.186			2.254		
Bicycle LOS	C			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	34.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	150	855	237	47	633	78	126	519	111	235	685	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	855	237	47	633	78	126	519	111	235	685	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	214	59	12	158	20	32	130	28	59	171	16
Total Analysis Volume [veh/h]	150	855	237	47	633	78	126	519	111	235	685	65
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	37	0	33	60	0	10	30	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	25	25	25	10	50	50	10	51	51
g / C, Green / Cycle	0.27	0.27	0.27	0.22	0.22	0.22	0.09	0.46	0.46	0.09	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.08	0.23	0.13	0.03	0.20	0.19	0.07	0.14	0.06	0.07	0.18	0.04
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	281	1008	478	207	426	404	158	1736	822	315	1744	826
d1, Uniform Delay [s]	32.42	38.34	34.22	34.02	41.19	40.82	49.24	18.81	17.31	48.88	19.67	16.72
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.57	2.09	0.80	0.55	5.69	4.75	8.74	0.44	0.34	3.53	0.67	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.53	0.85	0.50	0.23	0.87	0.84	0.80	0.30	0.13	0.75	0.39	0.08
d, Delay for Lane Group [s/veh]	33.98	40.43	35.02	34.57	46.88	45.58	57.98	19.25	17.65	52.41	20.33	16.91
Lane Group LOS	C	D	D	C	D	D	E	B	B	D	C	B
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.33	11.10	5.45	1.04	10.31	9.24	3.77	4.22	1.70	3.30	5.85	0.96
50th-Percentile Queue Length [ft/ln]	83.18	277.38	136.28	25.93	257.69	231.05	94.31	105.51	42.43	82.41	146.37	24.04
95th-Percentile Queue Length [veh/ln]	5.99	16.56	9.28	1.87	15.57	14.23	6.79	7.59	3.05	5.93	9.82	1.73
95th-Percentile Queue Length [ft/ln]	149.72	413.95	232.00	46.68	389.32	355.69	169.76	189.74	76.37	148.34	245.58	43.27

**Movement, Approach, & Intersection Results**

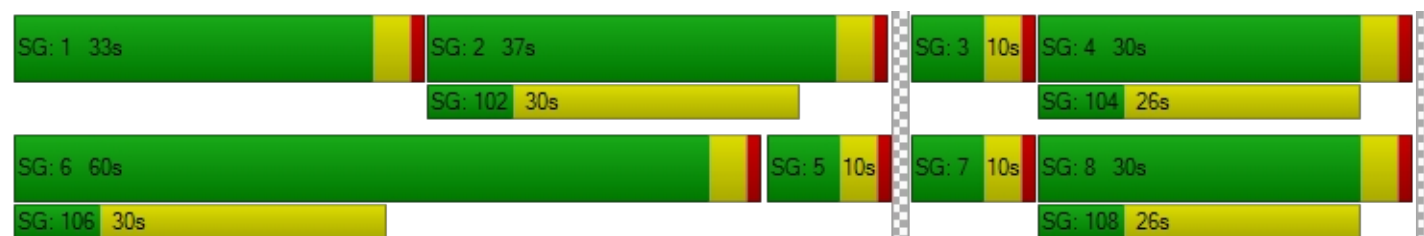
d_M, Delay for Movement [s/veh]	33.98	40.43	35.02	34.57	46.34	45.58	57.98	19.25	17.65	52.41	20.33	16.91
Movement LOS	C	D	D	C	D	D	E	B	B	D	C	B
d_A, Approach Delay [s/veh]	38.62			45.54			25.47			27.76		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	34.50											
Intersection LOS	C											
Intersection V/C	0.582											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.823			2.661			2.827			2.863		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			1018			473			473		
d_b, Bicycle Delay [s]	26.95			13.25			32.07			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.584			2.185			2.183			2.372		
Bicycle LOS	B			B			B			B		

**Sequence**



Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.569

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	66	1502	48	42	1267	42	47	73	74	78	129	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	1502	48	42	1267	42	47	73	74	78	129	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	376	12	11	317	11	12	18	19	20	32	7
Total Analysis Volume [veh/h]	66	1502	48	42	1267	42	47	73	74	78	129	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	75	0	0	75	0	0	35	0	0	35	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	88	88	88	88	88	88	14	14	14
g / C, Green / Cycle	0.80	0.80	0.80	0.80	0.80	0.80	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.04	0.42	0.42	0.02	0.36	0.35	0.11	0.04	0.09
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1267	1522	1442	1204	1522	1442	268	73	227
d1, Uniform Delay [s]	2.26	3.75	3.73	2.23	3.37	3.35	47.01	43.72	45.89
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	1.30	1.35	0.05	0.94	0.97	3.71	67.00	3.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.05	0.52	0.52	0.03	0.44	0.44	0.72	1.06	0.68
d, Delay for Lane Group [s/veh]	2.33	5.05	5.08	2.28	4.31	4.33	50.72	110.72	49.49
Lane Group LOS	A	A	A	A	A	A	D	F	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.25	4.95	4.66	0.16	3.75	3.51	5.45	3.18	4.26
50th-Percentile Queue Length [ft/ln]	6.16	123.69	116.59	3.89	93.63	87.85	136.23	79.52	106.55
95th-Percentile Queue Length [veh/ln]	0.44	8.60	8.21	0.28	6.74	6.33	9.28	5.73	7.65
95th-Percentile Queue Length [ft/ln]	11.09	214.89	205.13	7.00	168.54	158.13	231.94	143.14	191.19

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	2.33	5.06	5.08	2.28	4.32	4.33	50.72	50.72	50.72	110.72	49.49	49.49
Movement LOS	A	A	A	A	A	A	D	D	D	F	D	D
d_A, Approach Delay [s/veh]	4.95			4.26			50.72			69.99		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	11.76											
Intersection LOS	B											
Intersection V/C	0.569											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.012			2.947			2.028			2.138		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1291			1291			564			564		
d_b, Bicycle Delay [s]	6.91			6.91			28.37			28.37		
I_b,int, Bicycle LOS Score for Intersection	2.893			2.674			1.880			1.944		
Bicycle LOS	C			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	12.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.510

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	123	1112	77	59	860	75	81	44	142	100	43	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	1112	77	59	860	75	81	44	142	100	43	74
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	278	19	15	215	19	20	11	36	25	11	19
Total Analysis Volume [veh/h]	123	1112	77	59	860	75	81	44	142	100	43	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	72	0	0	72	0	0	38	0	0	38	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	83	83	83	83	83	83	18	18
g / C, Green / Cycle	0.76	0.76	0.76	0.76	0.76	0.76	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.07	0.32	0.32	0.03	0.26	0.25	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1239	1445	1369	1181	1445	1369	343	348
d1, Uniform Delay [s]	3.38	4.66	4.61	3.25	4.23	4.19	44.73	43.32
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.92	0.94	0.08	0.63	0.64	3.86	1.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.43	0.42	0.05	0.34	0.33	0.78	0.62
d, Delay for Lane Group [s/veh]	3.54	5.58	5.55	3.33	4.86	4.83	48.59	45.15
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.64	4.42	4.08	0.30	3.16	2.89	7.43	5.74
50th-Percentile Queue Length [ft/ln]	16.02	110.53	102.00	7.42	78.95	72.23	185.75	143.40
95th-Percentile Queue Length [veh/ln]	1.15	7.87	7.34	0.53	5.68	5.20	11.90	9.66
95th-Percentile Queue Length [ft/ln]	28.83	196.74	183.61	13.36	142.11	130.02	297.51	241.60

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	3.54	5.57	5.55	3.33	4.85	4.83	48.59	48.59	48.59	45.15	45.15	45.15
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	5.38			4.75			48.59			45.15		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	12.38											
Intersection LOS	B											
Intersection V/C	0.510											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.922			2.866			2.147			2.002		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1236			1236			618			618		
d_b, Bicycle Delay [s]	8.02			8.02			26.25			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.642			2.380			2.000			1.918		
Bicycle LOS	B			B			B			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-







### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	47.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.868

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	262	1422	289	203	1134	214	260	766	218	228	943	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	262	1422	289	203	1134	214	260	766	218	228	943	241
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	66	356	72	51	284	54	65	192	55	57	236	60
Total Analysis Volume [veh/h]	262	1422	289	203	1134	214	260	766	218	228	943	241
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	43	0	11	42	0	19	39	0	17	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	39	39	7	38	38	15	35	35	13	33	33
g / C, Green / Cycle	0.07	0.35	0.35	0.06	0.35	0.35	0.14	0.32	0.32	0.12	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.37	0.16	0.06	0.29	0.13	0.14	0.13	0.12	0.13	0.17	0.13
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	255	1346	638	223	1312	621	248	1807	571	215	1703	538
d1, Uniform Delay [s]	51.00	35.51	27.32	51.19	33.31	27.18	47.42	29.64	29.19	48.42	32.40	31.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	33.95	29.94	0.50	13.42	1.59	0.39	40.17	0.73	1.94	45.49	1.30	2.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.03	1.06	0.45	0.91	0.85	0.38	1.05	0.42	0.38	1.06	0.55	0.45
d, Delay for Lane Group [s/veh]	84.95	65.45	27.82	64.61	34.90	27.57	87.60	30.37	31.13	93.91	33.70	33.91
Lane Group LOS	F	F	C	E	C	C	F	C	C	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.69	23.16	5.89	3.19	13.70	4.77	9.52	5.42	4.76	8.60	7.18	5.56
50th-Percentile Queue Length [ft/ln]	117.35	578.93	147.19	79.68	342.62	119.31	238.03	135.58	119.11	214.95	179.58	138.91
95th-Percentile Queue Length [veh/ln]	8.32	32.23	9.87	5.74	19.78	8.35	14.89	9.24	8.34	13.73	11.58	9.42
95th-Percentile Queue Length [ft/ln]	208.07	805.76	246.68	143.43	494.40	208.87	372.24	231.06	208.61	343.18	289.47	235.56

**Movement, Approach, & Intersection Results**

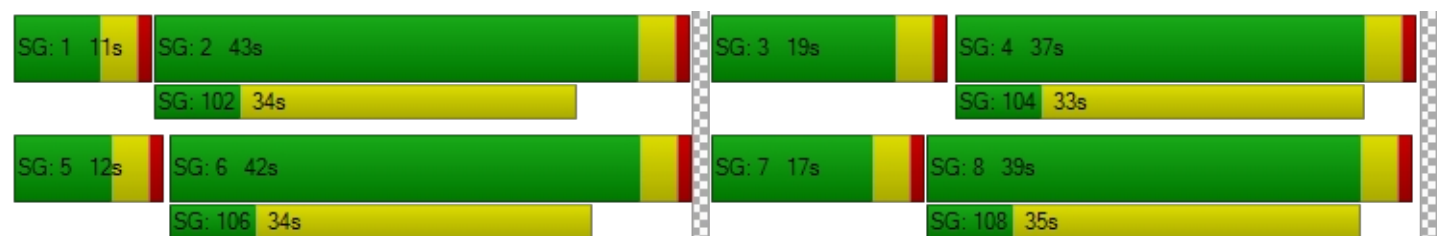
d_M, Delay for Movement [s/veh]	84.95	65.45	27.82	64.61	34.74	27.57	87.60	30.37	31.13	93.91	33.70	33.91
Movement LOS	F	F	C	E	C	C	F	C	C	F	C	C
d_A, Approach Delay [s/veh]	62.53			37.66			42.46			43.46		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	47.89											
Intersection LOS	D											
Intersection V/C	0.868											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.168			3.087			3.060			3.060		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	709			691			636			600		
d_b, Bicycle Delay [s]	22.91			23.56			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	3.187			2.413			2.244			2.336		
Bicycle LOS	C			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	41.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.915

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	288	1147	135	199	900	169	208	762	186	220	854	146
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	288	1147	135	199	900	169	208	762	186	220	854	146
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	287	34	50	225	42	52	191	47	55	214	37
Total Analysis Volume [veh/h]	288	1147	135	199	900	169	208	762	186	220	854	146
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	52	0	10	50	0	10	38	0	10	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	38	38	30	30	30	15	44	44	6	35	35
g / C, Green / Cycle	0.35	0.35	0.35	0.28	0.28	0.28	0.13	0.40	0.40	0.05	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.16	0.30	0.08	0.11	0.24	0.09	0.12	0.20	0.10	0.06	0.28	0.26
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	356	1313	622	231	1049	497	238	1514	717	194	611	579
d1, Uniform Delay [s]	28.08	33.78	25.50	32.44	37.80	31.84	46.87	24.91	22.21	52.00	35.02	34.39
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.42	1.98	0.17	9.12	2.16	0.40	9.69	1.20	0.88	74.78	14.71	12.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.81	0.87	0.22	0.86	0.86	0.34	0.87	0.50	0.26	1.14	0.86	0.82
d, Delay for Lane Group [s/veh]	32.50	35.77	25.67	41.56	39.97	32.24	56.57	26.11	23.09	126.79	49.73	46.60
Lane Group LOS	C	D	C	D	D	C	E	C	C	F	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.31	14.43	2.53	4.89	11.67	3.65	6.20	7.63	3.39	4.68	15.47	13.45
50th-Percentile Queue Length [ft/ln]	157.73	360.77	63.24	122.33	291.71	91.17	155.04	190.70	84.63	116.96	386.68	336.13
95th-Percentile Queue Length [veh/ln]	10.43	20.66	4.55	8.52	17.27	6.56	10.29	12.16	6.09	8.42	21.92	19.46
95th-Percentile Queue Length [ft/ln]	260.71	516.52	113.83	213.02	431.76	164.10	257.15	303.93	152.33	210.53	547.92	486.47

**Movement, Approach, & Intersection Results**

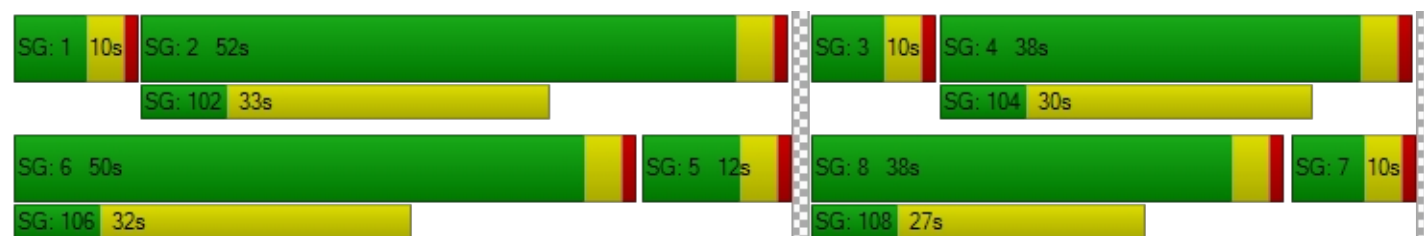
d_M, Delay for Movement [s/veh]	32.50	35.77	25.67	41.56	39.97	32.24	56.57	26.11	23.09	126.79	48.53	46.60
Movement LOS	C	D	C	D	D	C	E	C	C	F	D	D
d_A, Approach Delay [s/veh]	34.30			39.19			31.10			62.41		
Approach LOS	C			D			C			E		
d_I, Intersection Delay [s/veh]	41.36											
Intersection LOS	D											
Intersection V/C	0.915											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.930			2.912			2.957			2.983		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	873			836			618			618		
d_b, Bicycle Delay [s]	17.47			18.62			26.25			26.25		
I_b,int, Bicycle LOS Score for Intersection	2.855			2.606			2.195			2.566		
Bicycle LOS	C			B			B			B		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	145	1911	0	0	1520	630	0	0	0	230	352	318
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	145	1911	0	0	1520	630	0	0	0	230	352	318
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	478	0	0	380	158	0	0	0	58	88	80
Total Analysis Volume [veh/h]	145	1911	0	0	1520	630	0	0	0	230	352	318
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	32	0	0	22	0	0	0	0	0	68	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	71	61	61		21	21	21
g / C, Green / Cycle	0.06	0.71	0.61	0.61		0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.34	0.38	0.40		0.13	0.09	0.18
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	211	4035	2309	1094		382	806	382
d1, Uniform Delay [s]	46.06	6.42	12.36	12.79		35.59	34.22	37.71
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	3.93	0.40	1.27	3.07		1.53	0.37	4.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.47	0.62	0.66		0.60	0.44	0.83
d, Delay for Lane Group [s/veh]	49.99	6.82	13.63	15.86		37.13	34.59	42.49
Lane Group LOS	D	A	B	B		D	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.87	5.16	9.62	10.46		5.17	3.73	7.85
50th-Percentile Queue Length [ft/ln]	46.80	128.99	240.41	261.57		129.35	93.20	196.18
95th-Percentile Queue Length [veh/ln]	3.37	8.88	14.70	15.77		8.90	6.71	12.44
95th-Percentile Queue Length [ft/ln]	84.24	222.12	367.55	394.19		222.60	167.77	311.04

**Movement, Approach, & Intersection Results**

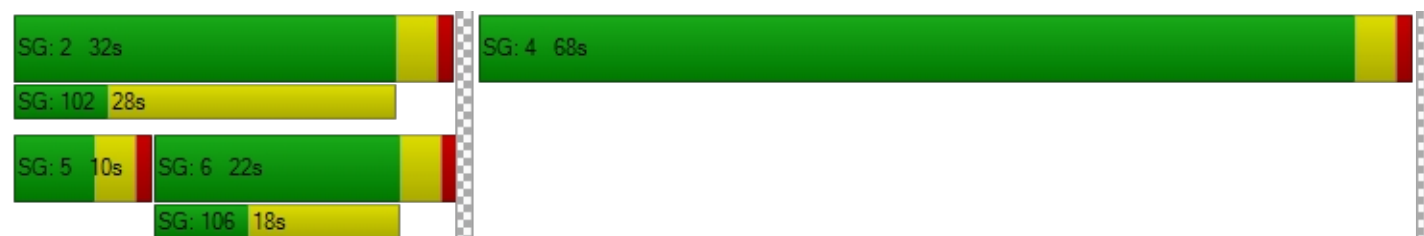
d_M, Delay for Movement [s/veh]	49.99	6.82	0.00	0.00	13.75	15.86	0.00	0.00	0.00	37.13	34.59	42.49
Movement LOS	D	A			B	B				D	C	D
d_A, Approach Delay [s/veh]	9.86			14.37			0.00			38.03		
Approach LOS	A			B			A			D		
d_I, Intersection Delay [s/veh]	16.73											
Intersection LOS	B											
Intersection V/C	0.700											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.269			2.355		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			360			0			1280		
d_b, Bicycle Delay [s]	25.92			33.62			50.00			6.48		
I_b,int, Bicycle LOS Score for Intersection	2.690			2.742			4.132			2.302		
Bicycle LOS	B			B			D			B		

**Sequence**

Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	74	1137	0	0	1078	304	0	0	0	159	490	761
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	1137	0	0	1078	304	0	0	0	159	490	761
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	284	0	0	270	76	0	0	0	40	123	190
Total Analysis Volume [veh/h]	74	1137	0	0	1078	304	0	0	0	159	490	761
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	33	0	0	23	0	0	0	0	0	67	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	5	46	37	37		46	46	46
g / C, Green / Cycle	0.05	0.46	0.37	0.37		0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.04	0.20	0.24	0.26		0.18	0.17	0.42
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	97	2623	1393	660		828	874	828
d1, Uniform Delay [s]	46.70	18.20	26.48	26.96		17.85	17.56	25.28
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	11.85	0.52	2.48	6.04		0.31	0.26	9.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.43	0.66	0.70		0.40	0.37	0.92
d, Delay for Lane Group [s/veh]	58.55	18.72	28.97	33.00		18.15	17.82	34.28
Lane Group LOS	E	B	C	C		B	B	C
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.12	5.86	9.42	10.21		4.93	4.75	18.05
50th-Percentile Queue Length [ft/ln]	53.12	146.51	235.49	255.21		123.29	118.67	451.28
95th-Percentile Queue Length [veh/ln]	3.82	9.83	14.45	15.45		8.57	8.32	25.02
95th-Percentile Queue Length [ft/ln]	95.62	245.77	361.33	386.20		214.34	207.99	625.48

**Movement, Approach, & Intersection Results**

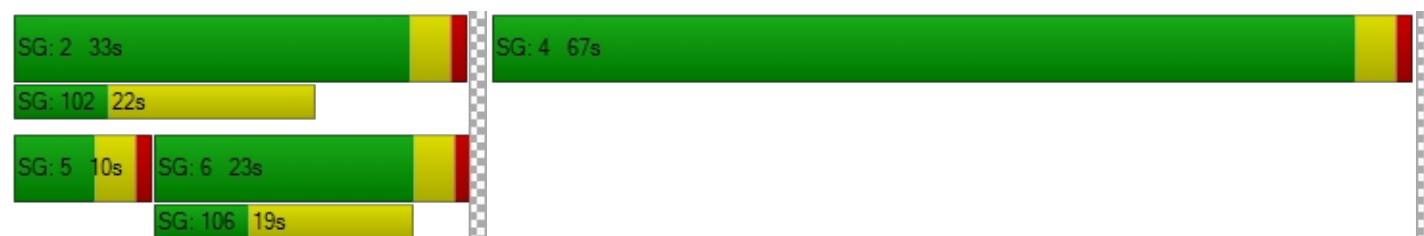
d_M, Delay for Movement [s/veh]	58.55	18.72	0.00	0.00	29.55	33.00	0.00	0.00	0.00	18.15	17.94	34.28
Movement LOS	E	B			C	C				B	B	C
d_A, Approach Delay [s/veh]	21.16			30.31			0.00			26.78		
Approach LOS	C			C			A			C		
d_I, Intersection Delay [s/veh]	26.30											
Intersection LOS	C											
Intersection V/C	0.818											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.143			2.403		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	580			380			0			1260		
d_b, Bicycle Delay [s]	25.21			32.81			50.00			6.85		
I_b,int, Bicycle LOS Score for Intersection	2.226			2.320			4.132			2.723		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	1091	229	335	1248	0	840	327	183	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1091	229	335	1248	0	840	327	183	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	273	57	84	312	0	210	82	46	0	0	0
Total Analysis Volume [veh/h]	0	1091	229	335	1248	0	840	327	183	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	16	45	0	0	55	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	48	48	11	63	29	29	29	
g / C, Green / Cycle	0.48	0.48	0.11	0.63	0.29	0.29	0.29	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.13	0.10	0.22	0.24	0.17	0.10	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	2726	861	402	3608	1004	545	517	
d1, Uniform Delay [s]	16.84	15.60	43.32	8.62	33.45	30.71	28.30	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.44	0.76	4.56	0.26	1.93	1.06	0.41	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.40	0.27	0.83	0.35	0.84	0.60	0.35	
d, Delay for Lane Group [s/veh]	17.28	16.36	47.89	8.89	35.38	31.77	28.71	
Lane Group LOS	B	B	D	A	D	C	C	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.33	3.23	4.28	3.98	9.62	6.85	3.51	
50th-Percentile Queue Length [ft/ln]	133.26	80.64	106.90	99.53	240.53	171.13	87.66	
95th-Percentile Queue Length [veh/ln]	9.12	5.81	7.67	7.17	14.71	11.14	6.31	
95th-Percentile Queue Length [ft/ln]	227.92	145.16	191.69	179.16	367.70	278.40	157.80	

**Movement, Approach, & Intersection Results**

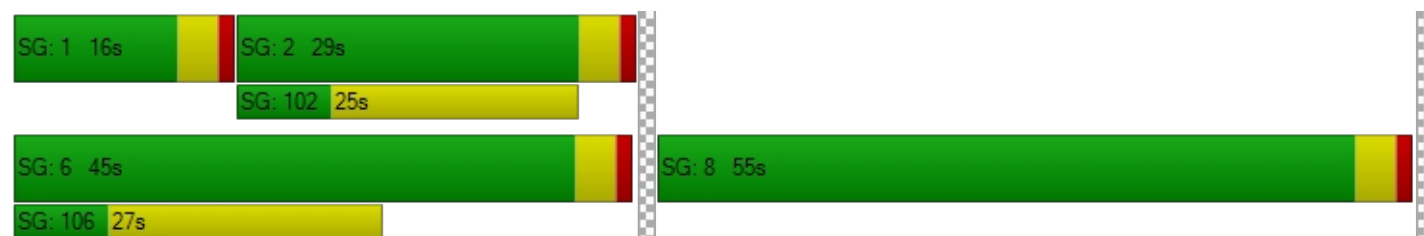
d_M, Delay for Movement [s/veh]	0.00	17.28	16.36	47.89	8.89	0.00	35.38	31.77	28.71	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	C	C			
d_A, Approach Delay [s/veh]	17.12			17.14			33.60			0.00		
Approach LOS	B			B			C			A		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.599											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.465			2.154		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			820			1020			0		
d_b, Bicycle Delay [s]	28.13			17.41			12.01			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.286			2.430			3.787			4.132		
Bicycle LOS	B			B			D			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.654

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	852	221	475	733	0	320	545	49	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	852	221	475	733	0	320	545	49	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	213	55	119	183	0	80	136	12	0	0	0
Total Analysis Volume [veh/h]	0	852	221	475	733	0	320	545	49	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	23	46	0	0	54	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	45	45	16	65	27	27	27	
g / C, Green / Cycle	0.45	0.45	0.16	0.65	0.27	0.27	0.27	
(v / s)_i Volume / Saturation Flow Rate	0.19	0.20	0.14	0.19	0.24	0.23	0.03	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1704	807	554	2457	492	519	492	
d1, Uniform Delay [s]	18.74	18.98	41.00	7.73	34.78	34.17	27.14	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.76	1.76	3.99	0.31	5.32	3.52	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.42	0.44	0.86	0.30	0.88	0.83	0.10	
d, Delay for Lane Group [s/veh]	19.50	20.74	44.99	8.04	40.10	37.69	27.23	
Lane Group LOS	B	C	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	5.66	5.94	5.94	3.25	10.60	10.17	0.88	
50th-Percentile Queue Length [ft/ln]	141.45	148.60	148.53	81.33	265.10	254.28	22.09	
95th-Percentile Queue Length [veh/ln]	9.56	9.94	9.94	5.86	15.94	15.40	1.59	
95th-Percentile Queue Length [ft/ln]	238.97	248.56	248.47	146.39	398.61	385.04	39.76	

**Movement, Approach, & Intersection Results**

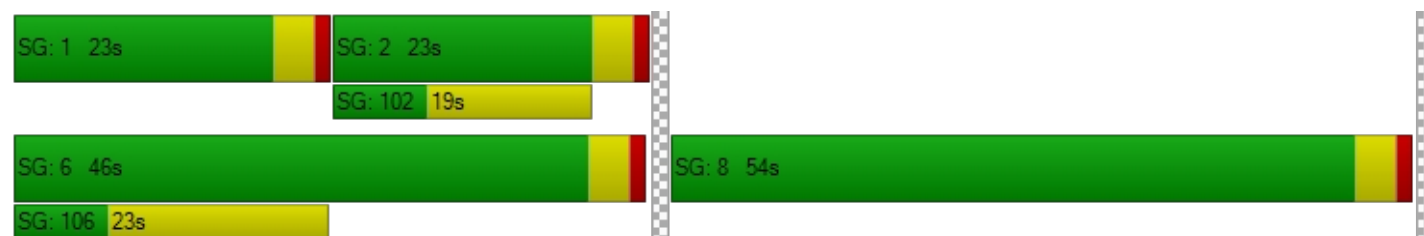
d_M, Delay for Movement [s/veh]	0.00	19.70	20.74	44.99	8.04	0.00	40.10	38.19	27.23	0.00	0.00	0.00
Movement LOS		B	C	D	A		D	D	C			
d_A, Approach Delay [s/veh]	19.91			22.57			38.27			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	26.17											
Intersection LOS	C											
Intersection V/C	0.654											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.242			2.325		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			840			1000			0		
d_b, Bicycle Delay [s]	32.81			16.82			12.50			50.00		
I_b,int, Bicycle LOS Score for Intersection	2.150			2.556			2.314			4.132		
Bicycle LOS	B			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	10.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.094

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	68	315	199	8	559
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	68	315	199	8	559
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	17	79	50	2	140
Total Analysis Volume [veh/h]	0	68	315	199	8	559
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	0.00	10.48	0.00	0.00	8.45	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.31	0.00	0.00	0.02	0.00
95th-Percentile Queue Length [ft/ln]	0.00	7.73	0.00	0.00	0.57	0.00
d_A, Approach Delay [s/veh]	10.48		0.00		0.12	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.68					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.438

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	1016	46	89	476	0	92	37	113	123	0	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1016	46	89	476	0	92	37	113	123	0	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	254	12	22	119	0	23	9	28	31	0	5
Total Analysis Volume [veh/h]	0	1016	46	89	476	0	92	37	113	123	0	19
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	54	0	10	64	0	0	46	0	46	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	91	91	11	11	11	11
g / C, Green / Cycle	0.74	0.74	0.82	0.82	0.10	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.28	0.30	0.05	0.13	0.05	0.08	0.07	0.01
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1396	1323	1362	3127	223	220	79	188
d1, Uniform Delay [s]	5.37	5.49	1.81	1.97	46.49	48.13	46.13	44.59
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.79	0.91	0.02	0.10	1.22	3.66	267.43	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.38	0.40	0.07	0.15	0.41	0.68	1.57	0.10
d, Delay for Lane Group [s/veh]	6.16	6.40	1.83	2.07	47.71	51.79	313.56	44.82
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.14	4.25	0.24	0.73	2.45	4.23	7.85	0.48
50th-Percentile Queue Length [ft/ln]	103.48	106.29	6.09	18.27	61.24	105.77	196.23	12.06
95th-Percentile Queue Length [veh/ln]	7.45	7.63	0.44	1.32	4.41	7.60	14.13	0.87
95th-Percentile Queue Length [ft/ln]	186.26	190.84	10.96	32.88	110.22	190.11	353.21	21.70

**Movement, Approach, & Intersection Results**

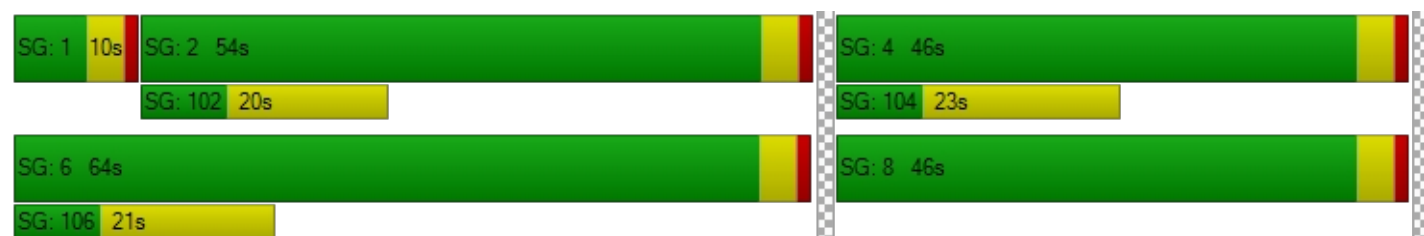
d_M, Delay for Movement [s/veh]	0.00	6.27	6.40	1.83	2.07	0.00	47.71	51.79	51.79	313.56	0.00	44.82
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	6.28			2.04			50.24			277.60		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	29.53											
Intersection LOS	C											
Intersection V/C	0.438											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.770			1.842			2.147		
Crosswalk LOS	F			C			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	909			1091			764			0		
d_b, Bicycle Delay [s]	16.36			11.36			21.02			55.00		
I_b,int, Bicycle LOS Score for Intersection	2.436			2.026			1.959			4.132		
Bicycle LOS	B			B			A			D		

**Sequence**

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	32.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.228

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	440	392	287	0	37	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	392	287	0	37	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	98	72	0	9	24
Total Analysis Volume [veh/h]	440	392	287	0	37	96
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.35	0.00	0.00	0.00	0.23	0.13
d_M, Delay for Movement [s/veh]	9.30	0.00	0.00	0.00	32.39	15.00
Movement LOS	A	A	A	A	D	C
95th-Percentile Queue Length [veh/ln]	1.56	0.00	0.00	0.00	1.57	1.57
95th-Percentile Queue Length [ft/ln]	38.94	0.00	0.00	0.00	39.32	39.32
d_A, Approach Delay [s/veh]	4.92		0.00		19.84	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	5.38					
Intersection LOS	D					

**Intersection Level Of Service Report****Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	33.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.038

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	339	861	374	0	5	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	339	861	374	0	5	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	215	94	0	1	21
Total Analysis Volume [veh/h]	339	861	374	0	5	85
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.29	0.01	0.00	0.00	0.04	0.13
d_M, Delay for Movement [s/veh]	9.25	0.00	0.00	0.00	33.80	11.65
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	1.19	0.00	0.00	0.00	0.59	0.59
95th-Percentile Queue Length [ft/ln]	29.74	0.00	0.00	0.00	14.63	14.63
d_A, Approach Delay [s/veh]	2.61		0.00		12.88	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.58					
Intersection LOS	D					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.273

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	1118	18	30	436	25	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1118	18	30	436	25	68
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	280	5	8	109	6	17
Total Analysis Volume [veh/h]	1118	18	30	436	25	68
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2



**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.05	0.00	0.09	0.27
d_M, Delay for Movement [s/veh]	0.00	0.00	11.15	0.00	26.14	27.38
Movement LOS	A	A	B	A	D	D
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.15	0.00	1.60	1.60
95th-Percentile Queue Length [ft/ln]	0.00	0.00	3.84	0.00	39.97	39.97
d_A, Approach Delay [s/veh]	0.00		0.72		27.04	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	1.68					
Intersection LOS	D					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.077

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	119	711	348	0	456	8	0	0	81	0	0	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	711	348	0	456	8	0	0	81	0	0	38
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	178	87	0	114	2	0	0	20	0	0	10
Total Analysis Volume [veh/h]	119	711	348	0	456	8	0	0	81	0	0	38
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.08
d_M, Delay for Movement [s/veh]	8.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.22	0.00	0.00	12.90
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.25
95th-Percentile Queue Length [ft/ln]	9.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.78	0.00	0.00	6.23
d_A, Approach Delay [s/veh]	0.88			0.00			10.22			12.90		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	1.34											
Intersection LOS	B											







*APPENDIX O-IV*

**YEAR 2020 CUMULATIVE PLUS PROJECT  
FRIDAY DEPARTURE PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 1: Harbor Boulevard at Bastanchury Road**

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.347

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Bastanchury Road			Bastanchury Road		
Base Volume Input [veh/h]	89	618	70	116	363	120	125	266	33	54	486	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	89	618	70	116	363	120	125	266	33	54	486	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	155	18	29	91	30	31	67	8	14	122	30
Total Analysis Volume [veh/h]	89	618	70	116	363	120	125	266	33	54	486	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	42	0	10	39	0	11	48	0	10	47	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	31	0	0	24	0	0	31	0	0	31	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	68	68	6	69	69	7	9	9	11	13	13
g / C, Green / Cycle	0.05	0.62	0.62	0.05	0.62	0.62	0.06	0.08	0.08	0.10	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.03	0.11	0.04	0.03	0.09	0.09	0.07	0.05	0.06	0.02	0.09	0.07
s, saturation flow rate [veh/h]	3500	5700	1800	3500	3800	1800	1800	3800	1800	3500	5700	1800
c, Capacity [veh/h]	179	3544	1119	186	2371	1123	114	299	142	353	662	209
d1, Uniform Delay [s]	50.82	8.83	8.19	51.01	8.51	8.53	51.52	49.25	49.46	45.18	46.98	46.05
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.12	0.11	0.11	3.39	0.12	0.26	67.40	2.49	6.47	0.20	1.60	2.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.17	0.06	0.62	0.14	0.14	1.09	0.66	0.71	0.15	0.73	0.57
d, Delay for Lane Group [s/veh]	52.94	8.93	8.29	54.39	8.64	8.79	118.93	51.74	55.94	45.38	48.58	48.52
Lane Group LOS	D	A	A	D	A	A	F	D	E	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.25	2.04	0.67	1.65	1.58	1.57	5.27	2.74	2.96	0.68	4.37	3.25
50th-Percentile Queue Length [ft/ln]	31.13	51.08	16.66	41.26	39.43	39.21	131.85	68.55	74.02	17.09	109.28	81.15
95th-Percentile Queue Length [veh/ln]	2.24	3.68	1.20	2.97	2.84	2.82	9.29	4.94	5.33	1.23	7.80	5.84
95th-Percentile Queue Length [ft/ln]	56.04	91.95	29.99	74.27	70.97	70.58	232.20	123.39	133.24	30.76	195.00	146.07

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	52.94	8.93	8.29	54.39	8.65	8.79	118.93	52.82	55.94	45.38	48.58	48.52
Movement LOS	D	A	A	D	A	A	F	D	E	D	D	D
d_A, Approach Delay [s/veh]	13.92			17.54			72.55			48.31		
Approach LOS	B			B			E			D		
d_I, Intersection Delay [s/veh]	34.13											
Intersection LOS	C											
Intersection V/C	0.347											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.992			2.913			2.759			2.979		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			636			800			782		
d_b, Bicycle Delay [s]	23.56			25.57			19.80			20.40		
I_b,int, Bicycle LOS Score for Intersection	1.987			1.889			1.793			1.923		
Bicycle LOS	A			A			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 2: Harbor Boulevard at Valley View Drive/Brea Boulevard**

Control Type:	Signalized	Delay (sec / veh):	22.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valley View Drive			Brea Boulevard		
Base Volume Input [veh/h]	17	581	316	36	507	7	20	31	13	344	36	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	581	316	36	507	7	20	31	13	344	36	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	145	79	9	127	2	5	8	3	86	9	0
Total Analysis Volume [veh/h]	17	581	316	36	507	7	20	31	13	344	36	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Unsigna	Protecte	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	32	0	10	31	0	0	10	0	0	58	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	17	0	0	20	0	0	0	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	L	C	C	L	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	71	4	72	72	5	5	5	14	14
g / C, Green / Cycle	0.02	0.64	0.04	0.65	0.65	0.05	0.05	0.05	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.01	0.10	0.02	0.11	0.06	0.01	0.02	0.01	0.11	0.11
s, saturation flow rate [veh/h]	1800	5700	1800	3800	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	42	3645	67	2484	1177	86	91	86	234	234
d1, Uniform Delay [s]	53.03	7.97	52.05	7.40	7.00	50.48	50.75	50.28	46.56	46.60
k, delay calibration	0.11	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.27	0.09	6.44	0.14	0.14	1.37	2.21	0.80	6.51	6.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.41	0.16	0.53	0.17	0.09	0.23	0.34	0.15	0.81	0.82
d, Delay for Lane Group [s/veh]	59.30	8.06	58.49	7.55	7.14	51.84	52.95	51.09	53.07	53.38
Lane Group LOS	E	A	E	A	A	D	D	D	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.54	1.78	1.10	1.82	0.87	0.56	0.88	0.36	5.44	5.50
50th-Percentile Queue Length [ft/ln]	13.40	44.47	27.40	45.54	21.86	14.08	22.06	9.07	135.93	137.58
95th-Percentile Queue Length [veh/ln]	0.96	3.20	1.97	3.28	1.57	1.01	1.59	0.65	9.26	9.35
95th-Percentile Queue Length [ft/ln]	24.12	80.04	49.32	81.98	39.35	25.35	39.71	16.33	231.54	233.76



**Movement, Approach, & Intersection Results**

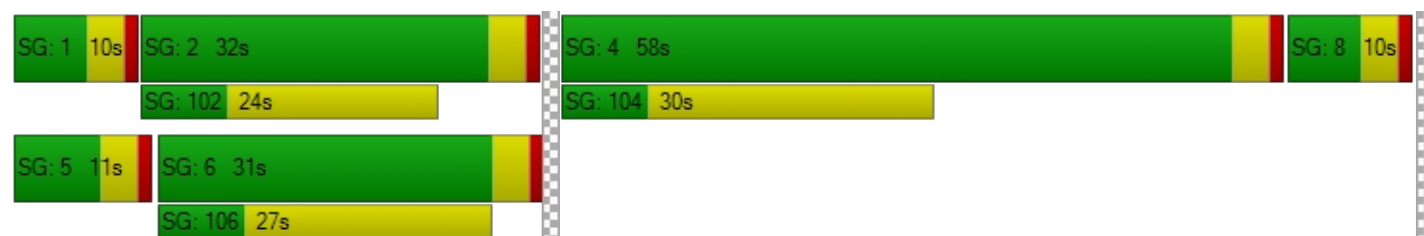
d_M, Delay for Movement [s/veh]	59.30	8.06	0.00	58.49	7.47	7.14	51.84	52.95	51.09	53.21	53.38	0.00
Movement LOS	E	A		E	A	A	D	D	D	D	D	
d_A, Approach Delay [s/veh]	9.52			10.81			52.23			53.22		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	22.11											
Intersection LOS	C											
Intersection V/C	0.286											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.764			2.171			2.095		
Crosswalk LOS	F			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	509			491			109			982		
d_b, Bicycle Delay [s]	30.56			31.31			49.16			14.25		
I_b,int, Bicycle LOS Score for Intersection	1.889			1.862			1.665			2.187		
Bicycle LOS	A			A			A			B		

**Sequence**





Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 3: Harbor Boulevard at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	33	697	37	119	584	5	17	41	26	82	68	323
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	697	37	119	584	5	17	41	26	82	68	323
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	174	9	30	146	1	4	10	7	21	17	81
Total Analysis Volume [veh/h]	33	697	37	119	584	5	17	41	26	82	68	323
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	5	2	0	1	6	0	0	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	6	6	0	0	6	0	0	6	6
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Split [s]	10	53	0	20	63	0	0	37	0	0	37	37
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	22	0	0	18	0	0	26	26
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall	No	No		No	No			No			No	No
Maximum Recall	No	No		No	No			No			No	No
Pedestrian Recall	No	No		No	No			No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	63	63	16	75	75	19	19	19	19	19	39
g / C, Green / Cycle	0.04	0.58	0.58	0.15	0.69	0.69	0.17	0.17	0.17	0.17	0.17	0.35
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.20	0.03	0.15	0.00	0.01	0.02	0.01	0.05	0.04	0.18
s, saturation flow rate [veh/h]	1800	1900	1800	3500	3800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	66	1094	1036	512	2604	1234	283	321	304	305	321	633
d1, Uniform Delay [s]	51.99	12.37	12.32	41.48	6.43	5.46	38.32	38.79	38.51	39.77	39.37	28.17
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.20
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.84	0.87	0.90	0.23	0.20	0.01	0.09	0.18	0.12	0.47	0.32	1.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.50	0.35	0.34	0.23	0.22	0.00	0.06	0.13	0.09	0.27	0.21	0.51
d, Delay for Lane Group [s/veh]	57.83	13.25	13.22	41.71	6.63	5.46	38.41	38.97	38.63	40.24	39.69	29.34
Lane Group LOS	E	B	B	D	A	A	D	D	D	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.00	5.05	4.70	1.45	2.39	0.04	0.39	0.96	0.60	1.97	1.62	6.87
50th-Percentile Queue Length [ft/ln]	25.00	126.34	117.42	36.15	59.66	0.89	9.82	23.96	15.09	49.29	40.38	171.72
95th-Percentile Queue Length [veh/ln]	1.80	8.74	8.25	2.60	4.30	0.06	0.71	1.72	1.09	3.55	2.91	11.17
95th-Percentile Queue Length [ft/ln]	45.00	218.50	206.27	65.06	107.39	1.60	17.68	43.12	27.15	88.73	72.68	279.18

**Movement, Approach, & Intersection Results**

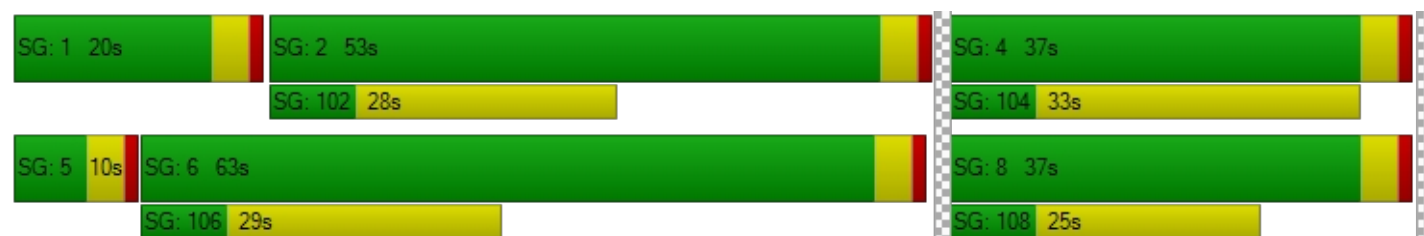
d_M, Delay for Movement [s/veh]	57.83	13.23	13.22	41.71	6.63	5.46	38.41	38.97	38.63	40.24	39.69	29.34
Movement LOS	E	B	B	D	A	A	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	15.15			12.52			38.75			32.72		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	19.30											
Intersection LOS	B											
Intersection V/C	0.431											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.711			2.871			2.187			2.440		
Crosswalk LOS	B			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			1073			600			600		
d_b, Bicycle Delay [s]	16.91			11.82			26.95			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.192			2.144			1.698			2.340		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	98.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.382

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	52	39	5	36	9	3	38	32	47	45	13
Total Analysis Volume [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Split	Split	Split	Split	Split	Split	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	8	0	4	0
Auxiliary Signal Groups									2,8			
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	6	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	38	0	0	30	0	0	42	42	0	42	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	7	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	16	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No			No			No	No		No	
Maximum Recall		No			No			No	No		No	
Pedestrian Recall		No			No			No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	43	43	43	11	11	59	11	11	11
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.39	0.10	0.10	0.53	0.10	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.09	0.01	0.10	0.01	0.08	0.07	0.10	0.06	0.06
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	709	709	709	709	709	117	197	961	86	197	186
d1, Uniform Delay [s]	23.30	23.43	22.14	20.42	22.45	44.46	48.06	12.86	46.40	47.19	47.02
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.28	1.35	0.72	0.07	0.86	0.34	6.48	0.28	538.45	3.08	2.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.34	0.35	0.22	0.03	0.25	0.09	0.78	0.13	2.18	0.61	0.58
d, Delay for Lane Group [s/veh]	24.58	24.79	22.85	20.49	23.31	44.80	54.54	13.14	584.85	50.26	49.86
Lane Group LOS	C	C	C	C	C	D	D	B	F	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.54	4.74	2.81	0.30	3.28	0.28	4.43	1.62	15.05	3.33	2.97
50th-Percentile Queue Length [ft/ln]	113.52	118.50	70.27	7.43	81.89	7.06	110.87	40.41	376.28	83.23	74.33
95th-Percentile Queue Length [veh/ln]	8.04	8.31	5.06	0.54	5.90	0.51	7.89	2.91	25.76	5.99	5.35
95th-Percentile Queue Length [ft/ln]	200.89	207.77	126.49	13.38	147.41	12.72	197.21	72.74	644.04	149.81	133.79



**Movement, Approach, & Intersection Results**

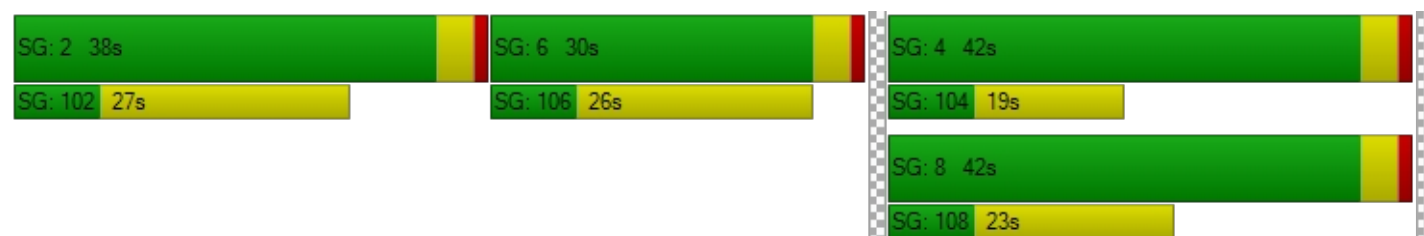
d_M, Delay for Movement [s/veh]	24.61	24.79	22.85	20.49	23.31	23.31	44.80	54.54	13.14	584.85	50.14	49.86
Movement LOS	C	C	C	C	C	C	D	D	B	F	D	D
d_A, Approach Delay [s/veh]	24.24			23.05			36.18			290.47		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	98.06											
Intersection LOS	F											
Intersection V/C	0.382											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.674			2.117			2.462			2.322		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	618			473			691			691		
d_b, Bicycle Delay [s]	26.25			32.07			23.56			23.56		
I_b,int, Bicycle LOS Score for Intersection	2.617			1.885			2.038			1.903		
Bicycle LOS	B			A			B			A		

**Sequence**



Ring 1	2	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 5: Hornet Way at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.290

**Intersection Setup**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

**Volumes**

Name	Hornet Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	91	10	170	414	302	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	91	10	170	414	302	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	3	43	104	76	7
Total Analysis Volume [veh/h]	91	10	170	414	302	26
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	1	0	0	8	4	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	85	0	0	25	25	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	19	0	0	0	14	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	R	L	C	C	R
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	7	95	95	95	95
g / C, Green / Cycle	0.07	0.07	0.86	0.86	0.86	0.86
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	0.09	0.22	0.16	0.01
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800
c, Capacity [veh/h]	120	120	1516	1635	1635	1549
d1, Uniform Delay [s]	50.37	48.09	1.18	1.37	1.27	1.09
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.24	0.29	0.15	0.37	0.25	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.76	0.08	0.11	0.25	0.18	0.02
d, Delay for Lane Group [s/veh]	59.61	48.38	1.33	1.74	1.52	1.11
Lane Group LOS	E	D	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.76	0.27	0.32	0.90	0.61	0.04
50th-Percentile Queue Length [ft/ln]	69.09	6.68	8.04	22.46	15.19	1.12
95th-Percentile Queue Length [veh/ln]	4.97	0.48	0.58	1.62	1.09	0.08
95th-Percentile Queue Length [ft/ln]	124.36	12.03	14.47	40.42	27.35	2.02

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	59.61	48.38	1.33	1.74	1.52	1.11
Movement LOS	E	D	A	A	A	A
d_A, Approach Delay [s/veh]	58.50		1.62		1.49	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	7.25					
Intersection LOS	A					
Intersection V/C	0.290					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersection	2.288	2.241	2.220
Crosswalk LOS	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	55.00	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	5.096	4.674
Bicycle LOS	D	F	E

**Sequence**

Ring 1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SG: 1 85s

SG: 101 26s

SG: 4 25s


SG: 104 21s

SG: 8 25s

**Intersection Level Of Service Report**  
**Intersection 6: Euclid Street at Malvern Avenue**

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.430

**Intersection Setup**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Euclid Street			Euclid Street			Malvern Avenue			Malvern Avenue		
Base Volume Input [veh/h]	79	545	102	49	471	16	18	247	98	174	466	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	545	102	49	471	16	18	247	98	174	466	139
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	136	26	12	118	4	5	62	25	44	117	35
Total Analysis Volume [veh/h]	79	545	102	49	471	16	18	247	98	174	466	139
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	30	0	10	30	0	10	60	0	10	60	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	18	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	74	65	65	74	64	64	29	18	18	29	22	22
g / C, Green / Cycle	0.67	0.59	0.59	0.67	0.58	0.58	0.26	0.17	0.17	0.26	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.18	0.17	0.03	0.13	0.13	0.01	0.10	0.09	0.10	0.17	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1177	1118	1059	1128	1104	1046	273	320	303	409	379	359
d1, Uniform Delay [s]	6.36	11.36	11.23	6.25	11.12	11.11	30.47	42.10	41.83	33.39	42.46	41.80
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.70	0.69	0.02	0.48	0.50	0.10	1.60	1.47	0.70	5.41	3.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.30	0.29	0.04	0.23	0.23	0.07	0.57	0.54	0.43	0.85	0.79
d, Delay for Lane Group [s/veh]	6.47	12.06	11.92	6.26	11.60	11.60	30.57	43.71	43.31	34.09	47.87	45.61
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.64	4.24	3.77	0.37	3.01	2.83	0.37	4.69	4.15	3.89	8.96	7.60
50th-Percentile Queue Length [ft/ln]	15.90	105.94	94.27	9.27	75.31	70.76	9.17	117.36	103.72	97.13	224.03	190.08
95th-Percentile Queue Length [veh/ln]	1.14	7.61	6.79	0.67	5.42	5.09	0.66	8.25	7.47	6.99	13.87	12.13
95th-Percentile Queue Length [ft/ln]	28.62	190.34	169.68	16.68	135.56	127.36	16.51	206.20	186.69	174.84	346.76	303.14



**Movement, Approach, & Intersection Results**

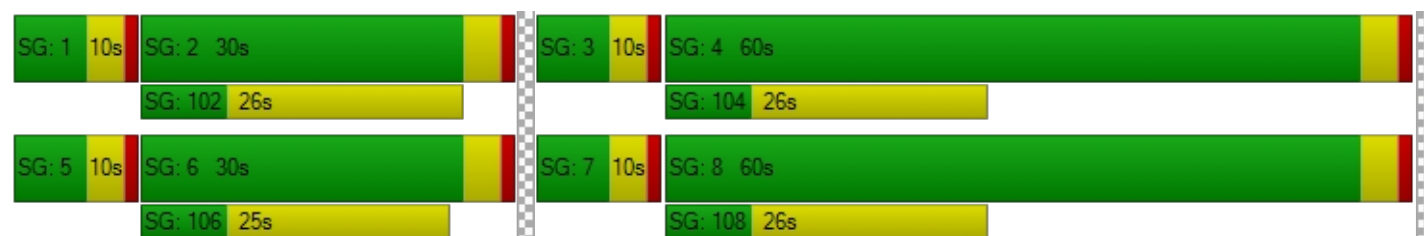
d_M, Delay for Movement [s/veh]	6.47	12.01	11.92	6.26	11.60	11.60	30.57	43.60	43.31	34.09	47.17	45.61
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	11.39			11.11			42.88			43.97		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	26.64											
Intersection LOS	C											
Intersection V/C	0.430											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.642			2.556			2.557			2.581		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	473			473			1018			1018		
d_b, Bicycle Delay [s]	32.07			32.07			13.25			13.25		
I_b,int, Bicycle LOS Score for Intersection	2.159			2.002			1.859			2.202		
Bicycle LOS	B			B			A			B		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 7: Harbor Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	28.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.540

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	92	557	120	98	578	103	110	334	71	288	652	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	92	557	120	98	578	103	110	334	71	288	652	92
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	139	30	25	145	26	28	84	18	72	163	23
Total Analysis Volume [veh/h]	92	557	120	98	578	103	110	334	71	288	652	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	36	0	11	36	0	12	31	0	32	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	66	56	56	66	56	56	36	15	15	36	25	25
g / C, Green / Cycle	0.60	0.51	0.51	0.60	0.51	0.51	0.33	0.14	0.14	0.33	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.05	0.19	0.18	0.05	0.19	0.18	0.06	0.11	0.11	0.16	0.17	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	964	973	922	965	974	923	399	263	249	493	870	412
d1, Uniform Delay [s]	9.23	16.15	15.93	9.27	16.12	15.93	26.62	46.04	45.76	29.75	39.50	34.48
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	1.07	1.03	0.05	1.07	1.04	0.37	5.93	5.03	1.10	1.32	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.10	0.37	0.35	0.10	0.37	0.35	0.28	0.81	0.77	0.58	0.75	0.22
d, Delay for Lane Group [s/veh]	9.43	17.22	16.96	9.31	17.19	16.97	26.99	51.97	50.79	30.85	40.82	34.75
Lane Group LOS	A	B	B	A	B	B	C	D	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.95	5.59	4.92	0.98	5.59	4.98	2.12	6.06	5.39	6.23	8.30	2.04
50th-Percentile Queue Length [ft/ln]	23.86	139.71	122.97	24.40	139.81	124.41	52.94	151.55	134.81	155.68	207.47	50.91
95th-Percentile Queue Length [veh/ln]	1.72	9.47	8.56	1.76	9.47	8.63	3.81	10.10	9.20	10.32	13.02	3.67
95th-Percentile Queue Length [ft/ln]	42.95	236.63	213.90	43.93	236.77	215.87	95.29	252.49	230.01	257.99	325.58	91.64

**Movement, Approach, & Intersection Results**

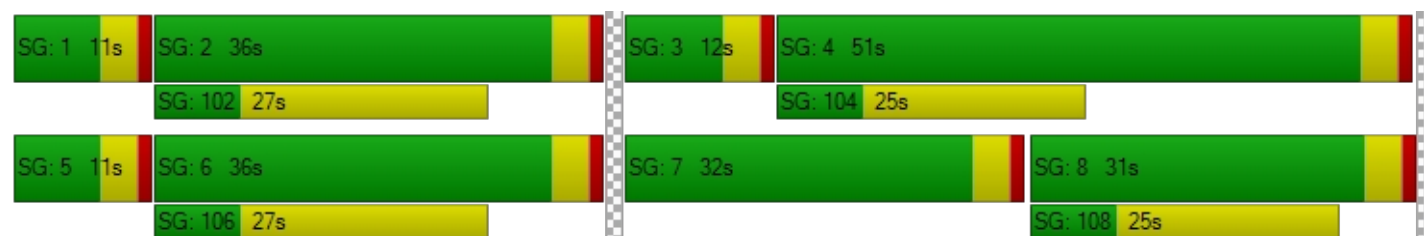
d_M, Delay for Movement [s/veh]	9.43	17.13	16.96	9.31	17.11	16.97	26.99	51.54	50.79	30.85	40.82	34.75
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	16.18			16.11			46.20			37.49		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	28.26											
Intersection LOS	C											
Intersection V/C	0.540											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.706			2.648			2.645			2.794		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			582			491			855		
d_b, Bicycle Delay [s]	27.65			27.65			31.31			18.04		
I_b,int, Bicycle LOS Score for Intersection	2.194			2.202			1.984			2.411		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 8: Lemon Street at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

**Intersection Setup**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	93	252	68	229	422	442	108	408	64	220	554	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	252	68	229	422	442	108	408	64	220	554	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	63	17	57	106	111	27	102	16	55	139	11
Total Analysis Volume [veh/h]	93	252	68	229	422	442	108	408	64	220	554	44
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	36	0	11	36	0	12	50	0	13	51	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	21	0	0	18	0	0	20	0	0	16	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	71	60	60	71	61	61	8	18	18	9	19	19
g / C, Green / Cycle	0.65	0.55	0.55	0.65	0.56	0.56	0.07	0.17	0.17	0.08	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.04	0.13	0.22	0.25	0.06	0.13	0.12	0.06	0.15	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	1900	1800	3500	3800	1800
c, Capacity [veh/h]	982	2068	979	1191	1057	1001	132	315	298	282	656	311
d1, Uniform Delay [s]	7.32	12.26	11.89	7.96	13.94	14.37	50.28	44.07	43.80	49.65	44.10	38.62
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	0.12	0.14	0.08	1.13	1.41	11.52	4.35	3.87	4.64	3.07	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.09	0.12	0.07	0.19	0.40	0.44	0.82	0.79	0.75	0.78	0.84	0.14
d, Delay for Lane Group [s/veh]	7.52	12.38	12.03	8.04	15.06	15.78	61.80	48.42	47.68	54.29	47.17	38.82
Lane Group LOS	A	B	B	A	B	B	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.83	1.52	0.82	2.11	6.11	6.63	3.35	6.81	6.13	3.14	7.55	1.03
50th-Percentile Queue Length [ft/ln]	20.81	38.06	20.41	52.83	152.73	165.83	83.68	170.31	153.34	78.59	188.69	25.72
95th-Percentile Queue Length [veh/ln]	1.50	2.74	1.47	3.80	10.16	10.86	6.03	11.09	10.20	5.66	12.05	1.85
95th-Percentile Queue Length [ft/ln]	37.46	68.51	36.74	95.10	254.07	271.42	150.63	277.32	254.88	141.47	301.33	46.29



**Movement, Approach, & Intersection Results**

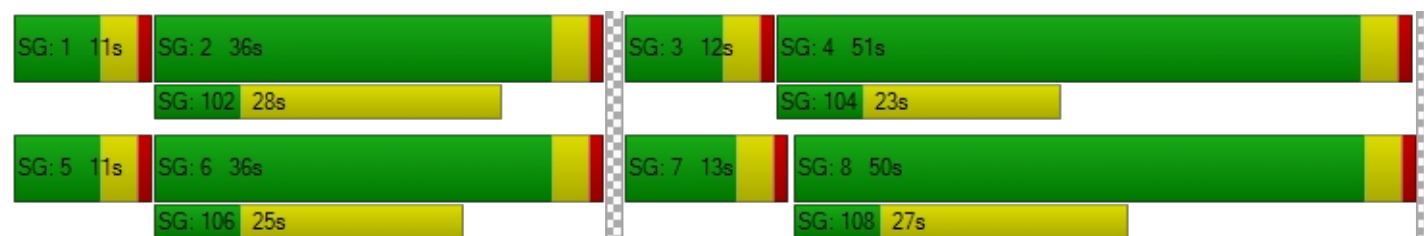
d_M, Delay for Movement [s/veh]	7.52	12.38	12.03	8.04	15.06	15.78	61.80	48.12	47.68	54.29	47.17	38.82
Movement LOS	A	B	B	A	B	B	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.22			13.88			50.62			48.64		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	30.63											
Intersection LOS	C											
Intersection V/C	0.554											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.644			2.601			2.711			2.999		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	582			582			836			855		
d_b, Bicycle Delay [s]	27.65			27.65			18.62			18.04		
I_b,int, Bicycle LOS Score for Intersection	1.900			2.461			2.038			2.234		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 9: Berkeley Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.461

**Intersection Setup**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

**Volumes**

Name	Berkeley Avenue			Berkeley Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	9	13	18	765	15	340	44	661	10	24	613	202
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	13	18	765	15	340	44	661	10	24	613	202
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	3	5	191	4	85	11	165	3	6	153	51
Total Analysis Volume [veh/h]	9	13	18	765	15	340	44	661	10	24	613	202
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Overlap
Signal group	0	2	0	1	6	0	3	8	0	0	4	4
Auxiliary Signal Groups												1,4
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	6	6	0	0	6	6
Maximum Green [s]	0	30	0	30	30	0	30	30	0	0	30	30
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0
Split [s]	0	10	0	58	68	0	10	42	0	0	32	32
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	20	0	0	20	0	0	21	21
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0
Minimum Recall		No		No	No		No	No			No	No
Maximum Recall		No		No	No		No	No			No	No
Pedestrian Recall		No		No	No		No	No			No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	4	4	28	36	66	66	66	57	57	89
g / C, Green / Cycle	0.04	0.04	0.04	0.25	0.33	0.60	0.60	0.60	0.52	0.52	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.01	0.22	0.20	0.02	0.18	0.18	0.01	0.16	0.11
s, saturation flow rate [veh/h]	1800	1900	1800	3500	1800	1800	1900	1800	1800	3800	1800
c, Capacity [veh/h]	66	74	70	891	594	999	1135	1075	801	1977	1460
d1, Uniform Delay [s]	51.07	51.17	51.33	39.12	30.77	9.15	10.90	10.89	12.84	15.11	2.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.94	1.11	1.90	2.54	0.97	0.02	0.69	0.73	0.07	0.41	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.14	0.18	0.26	0.86	0.60	0.04	0.30	0.30	0.03	0.31	0.14
d, Delay for Lane Group [s/veh]	52.02	52.28	53.23	41.66	31.74	9.16	11.60	11.62	12.91	15.52	2.25
Lane Group LOS	D	D	D	D	C	A	B	B	B	B	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.26	0.37	0.52	10.06	7.94	0.43	4.19	3.96	0.30	4.41	0.67
50th-Percentile Queue Length [ft/ln]	6.42	9.24	12.97	251.39	198.62	10.74	104.78	98.94	7.54	110.27	16.78
95th-Percentile Queue Length [veh/ln]	0.46	0.67	0.93	15.26	12.57	0.77	7.54	7.12	0.54	7.86	1.21
95th-Percentile Queue Length [ft/ln]	11.56	16.64	23.34	381.41	314.19	19.33	188.61	178.09	13.57	196.38	30.20

**Movement, Approach, & Intersection Results**

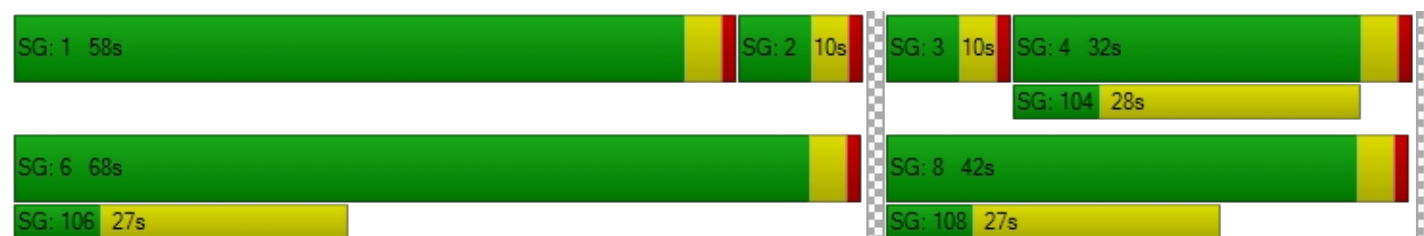
d_M, Delay for Movement [s/veh]	52.02	52.28	53.23	41.66	31.74	31.74	9.16	11.61	11.62	12.91	15.52	2.25
Movement LOS	D	D	D	D	C	C	A	B	B	B	B	A
d_A, Approach Delay [s/veh]	52.65			38.52			11.46			12.25		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	23.48											
Intersection LOS	C											
Intersection V/C	0.461											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			0.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			0.00		
I_p,int, Pedestrian LOS Score for Intersection	2.196			2.510			2.649			0.000		
Crosswalk LOS	B			B			B			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	109			1164			691			509		
d_b, Bicycle Delay [s]	49.16			9.62			23.56			30.56		
I_b,int, Bicycle LOS Score for Intersection	1.626			3.408			2.149			2.252		
Bicycle LOS	A			C			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 10: Raymond Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.552

**Intersection Setup**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Raymond Avenue			Raymond Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	96	59	77	41	54	35	45	1186	236	92	689	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	59	77	41	54	35	45	1186	236	92	689	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	15	19	10	14	9	11	297	59	23	172	9
Total Analysis Volume [veh/h]	96	59	77	41	54	35	45	1186	236	92	689	35
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	31	0	11	30	0	10	57	0	11	58	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	18	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	8	7	7	6	6	6	87	77	77	87	78	78
g / C, Green / Cycle	0.07	0.06	0.06	0.05	0.05	0.05	0.79	0.70	0.70	0.79	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.04	0.02	0.02	0.02	0.03	0.39	0.38	0.05	0.20	0.19
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	160	122	116	191	98	93	1368	1327	1257	1135	1347	1276
d1, Uniform Delay [s]	48.39	49.73	50.34	50.65	50.73	50.69	2.57	8.25	8.02	2.64	5.82	5.79
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.58	2.92	6.37	0.56	3.48	3.44	0.01	1.73	1.65	0.14	0.51	0.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.60	0.48	0.66	0.21	0.47	0.46	0.03	0.56	0.54	0.08	0.28	0.27
d, Delay for Lane Group [s/veh]	51.97	52.66	56.72	51.20	54.21	54.13	2.58	9.97	9.67	2.78	6.33	6.32
Lane Group LOS	D	D	E	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.77	1.67	2.27	1.13	1.34	1.23	0.17	8.38	7.40	0.39	2.99	2.78
50th-Percentile Queue Length [ft/ln]	69.20	41.65	56.87	28.13	33.50	30.65	4.26	209.46	184.94	9.86	74.67	69.49
95th-Percentile Queue Length [veh/ln]	4.98	3.00	4.09	2.03	2.41	2.21	0.31	13.13	11.86	0.71	5.38	5.00
95th-Percentile Queue Length [ft/ln]	124.56	74.97	102.36	50.63	60.29	55.17	7.67	328.13	296.45	17.75	134.40	125.08



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	51.97	52.66	56.72	51.20	54.20	54.13	2.58	9.86	9.67	2.78	6.33	6.32
Movement LOS	D	D	E	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	53.72			53.24			9.61			5.93		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	14.49											
Intersection LOS	B											
Intersection V/C	0.552											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.523			2.253			2.848			2.725		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			473			964			982		
d_b, Bicycle Delay [s]	31.31			32.07			14.77			14.25		
I_b,int, Bicycle LOS Score for Intersection	1.942			1.667			2.770			2.233		
Bicycle LOS	A			A			C			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 11: Acacia Avenue at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	6.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.389

**Intersection Setup**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Acacia Avenue			Acacia Avenue			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	25	24	31	31	19	19	24	1160	24	45	728	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	24	31	31	19	19	24	1160	24	45	728	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	6	8	8	5	5	6	290	6	11	182	7
Total Analysis Volume [veh/h]	25	24	31	31	19	19	24	1160	24	45	728	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	31	0	0	31	0	10	69	0	10	69	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	6	6	6	6	6	96	88	88	96	89	89
g / C, Green / Cycle	0.05	0.05	0.05	0.05	0.05	0.88	0.80	0.80	0.88	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.02	0.02	0.02	0.01	0.32	0.32	0.03	0.20	0.20
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	90	95	90	105	90	1579	1519	1439	1493	1543	1461
d1, Uniform Delay [s]	50.30	50.24	50.47	50.47	50.68	0.84	3.26	3.25	0.85	2.45	2.44
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.67	1.36	2.23	1.56	3.08	0.00	0.79	0.83	0.04	0.39	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.28	0.25	0.34	0.30	0.42	0.02	0.40	0.40	0.03	0.25	0.25
d, Delay for Lane Group [s/veh]	51.97	51.60	52.70	52.04	53.76	0.85	4.05	4.07	0.89	2.84	2.85
Lane Group LOS	D	D	D	D	D	A	A	A	A	A	A
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.70	0.67	0.88	0.87	1.09	0.02	3.24	3.05	0.06	1.57	1.47
50th-Percentile Queue Length [ft/ln]	17.61	16.79	22.01	21.75	27.30	0.57	80.90	76.29	1.39	39.13	36.73
95th-Percentile Queue Length [veh/ln]	1.27	1.21	1.58	1.57	1.97	0.04	5.82	5.49	0.10	2.82	2.64
95th-Percentile Queue Length [ft/ln]	31.69	30.22	39.62	39.15	49.15	1.02	145.62	137.32	2.50	70.43	66.11

**Movement, Approach, & Intersection Results**

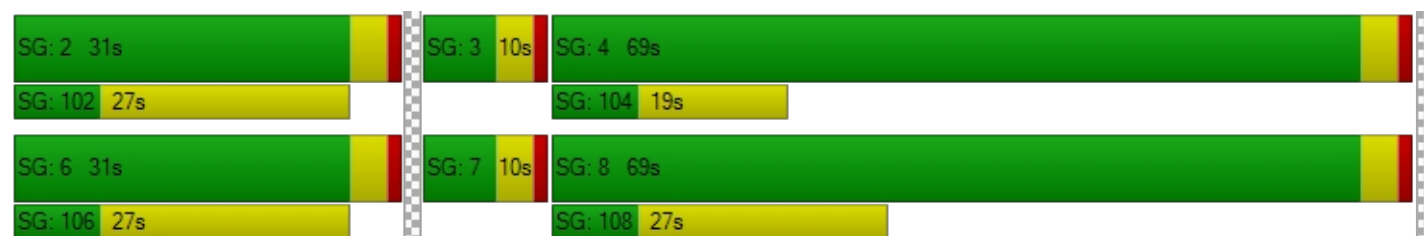
d_M, Delay for Movement [s/veh]	51.97	51.60	52.70	52.04	53.76	53.76	0.85	4.06	4.07	0.89	2.85	2.85
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	52.14			52.98			4.00			2.74		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	6.88											
Intersection LOS	A											
Intersection V/C	0.389											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.234			2.025			2.731			2.748		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	491			491			1182			1182		
d_b, Bicycle Delay [s]	31.31			31.31			9.20			9.20		
I_b,int, Bicycle LOS Score for Intersection	1.692			1.673			2.556			2.219		
Bicycle LOS	A			A			B			B		

**Sequence**





Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 12: State College Boulevard at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	37.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

**Intersection Setup**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	State College Boulevard			State College Boulevard			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	98	277	93	111	314	198	190	899	97	114	558	138
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	277	93	111	314	198	190	899	97	114	558	138
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	69	23	28	79	50	48	225	24	29	140	35
Total Analysis Volume [veh/h]	98	277	93	111	314	198	190	899	97	114	558	138
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	6	3	8	0	7	4	0
Auxiliary Signal Groups						3,6						
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	34	0	13	37	37	17	51	0	12	46	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	26	26	0	23	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	50	50	6	49	73	19	30	30	9	19	19
g / C, Green / Cycle	0.05	0.45	0.45	0.05	0.45	0.66	0.17	0.27	0.27	0.08	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.05	0.07	0.05	0.03	0.08	0.11	0.05	0.24	0.05	0.06	0.15	0.08
s, saturation flow rate [veh/h]	1800	3800	1800	3500	3800	1800	3500	3800	1800	1800	3800	1800
c, Capacity [veh/h]	100	1712	811	187	1705	1187	612	1028	487	144	669	317
d1, Uniform Delay [s]	51.95	17.93	17.53	50.93	18.24	7.16	39.65	38.37	30.96	49.73	43.82	40.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	38.06	0.20	0.29	2.96	0.24	0.07	0.29	2.53	0.20	9.23	2.83	0.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.98	0.16	0.11	0.59	0.18	0.17	0.31	0.87	0.20	0.79	0.83	0.44
d, Delay for Lane Group [s/veh]	90.02	18.14	17.82	53.89	18.48	7.23	39.93	40.90	31.16	58.95	46.64	41.43
Lane Group LOS	F	B	B	D	B	A	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.75	2.12	1.43	1.57	2.44	1.69	2.27	11.80	2.02	3.44	7.56	3.42
50th-Percentile Queue Length [ft/ln]	93.72	53.08	35.67	39.27	61.07	42.25	56.74	294.92	50.45	86.06	188.99	85.45
95th-Percentile Queue Length [veh/ln]	6.75	3.82	2.57	2.83	4.40	3.04	4.09	17.43	3.63	6.20	12.07	6.15
95th-Percentile Queue Length [ft/ln]	168.69	95.55	64.21	70.69	109.93	76.06	102.13	435.73	90.82	154.90	301.72	153.82



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	90.02	18.14	17.82	53.89	18.48	7.23	39.93	40.90	31.16	58.95	46.64	41.43
Movement LOS	F	B	B	D	B	A	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	33.13			21.21			39.95			47.49		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.11											
Intersection LOS	D											
Intersection V/C	0.511											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.624			2.775			2.888			2.773		
Crosswalk LOS	B			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			600			855			764		
d_b, Bicycle Delay [s]	29.09			26.95			18.04			21.02		
I_b,int, Bicycle LOS Score for Intersection	1.946			2.074			2.538			2.228		
Bicycle LOS	A			B			B			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 13: SR-57 SB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

**Intersection Setup**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 SB Ramps			SR-57 SB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	0	0	0	78	0	153	0	890	594	230	749	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	78	0	153	0	890	594	230	749	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	0	38	0	223	149	58	187	0
Total Analysis Volume [veh/h]	0	0	0	78	0	153	0	890	594	230	749	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	0	6	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	0	0	0	0	30	0	0	30	0	30	30	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	0	0	0	21	0	0	72	0	17	89	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	8	0	0	10	0
Rest In Walk					No			No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group		C	R	C	C	L	C
C, Cycle Length [s]		110	110	110	110	110	110
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]		11	11	71	71	16	91
g / C, Green / Cycle		0.10	0.10	0.64	0.64	0.14	0.82
(v / s)_i Volume / Saturation Flow Rate		0.04	0.09	0.23	0.33	0.13	0.20
s, saturation flow rate [veh/h]		1800	1800	3800	1800	1800	3800
c, Capacity [veh/h]		187	187	2442	1157	259	3128
d1, Uniform Delay [s]		46.13	48.23	9.17	10.48	46.19	2.14
k, delay calibration		0.11	0.11	0.50	0.50	0.11	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.47	8.36	0.42	1.63	9.86	0.18
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity		0.42	0.82	0.36	0.51	0.89	0.24
d, Delay for Lane Group [s/veh]		47.60	56.59	9.59	12.11	56.05	2.32
Lane Group LOS		D	E	A	B	E	A
Critical Lane Group		No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]		2.07	4.53	4.81	7.65	6.84	1.25
50th-Percentile Queue Length [ft/ln]		51.83	113.26	120.36	191.27	171.06	31.31
95th-Percentile Queue Length [veh/ln]		3.73	8.02	8.41	12.19	11.13	2.25
95th-Percentile Queue Length [ft/ln]		93.29	200.52	210.32	304.67	278.31	56.35

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	47.60	47.60	56.59	0.00	9.59	12.11	56.05	2.32	0.00
Movement LOS				D	D	E		A	B	E	A	
d_A, Approach Delay [s/veh]	0.00			53.55			10.60			14.95		
Approach LOS	A			D			B			B		
d_I, Intersection Delay [s/veh]	15.86											
Intersection LOS	B											
Intersection V/C	0.609											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.236	1.837	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	309	1236	1545
d_b, Bicycle Delay [s]	55.00	39.31	8.02	2.84
I_b,int, Bicycle LOS Score for Intersection	4.132	1.941	2.376	2.367
Bicycle LOS	D	A	B	B

**Sequence**




Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 14: SR-57 NB Ramps at Chapman Avenue**

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

**Intersection Setup**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No						No			No		
Crosswalk	Yes			Yes			No			No		

**Volumes**

Name	SR-57 NB Ramps			SR-57 NB Ramps			Chapman Avenue			Chapman Avenue		
Base Volume Input [veh/h]	412	0	322	0	0	0	315	657	0	0	557	115
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	412	0	322	0	0	0	315	657	0	0	557	115
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	0	81	0	0	0	79	164	0	0	139	29
Total Analysis Volume [veh/h]	412	0	322	0	0	0	315	657	0	0	557	115
Presence of On-Street Parking	No		No				No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	0	0	0	0	0	3	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	0	0	0	6	6	0	0	6	0
Maximum Green [s]	30	0	0	0	0	0	30	30	0	0	30	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Split [s]	52	0	0	0	0	0	39	58	0	0	19	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	14	0	0	8	0
Rest In Walk	No							No			No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No						No	No			No	
Maximum Recall	No						No	No			No	
Pedestrian Recall	No						No	No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R		L	C	C	C
C, Cycle Length [s]	110	110	110		110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00		4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00		2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19		22	83	58	58
g / C, Green / Cycle	0.17	0.17	0.17		0.20	0.76	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.13		0.18	0.17	0.18	0.19
s, saturation flow rate [veh/h]	1800	1800	1800		1800	3800	1900	1800
c, Capacity [veh/h]	309	309	309		352	2870	994	942
d1, Uniform Delay [s]	43.91	43.68	43.32		43.12	3.98	15.18	15.36
k, delay calibration	0.11	0.11	0.11		0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.43	4.67	3.72		8.02	0.19	0.92	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.82	0.80	0.75		0.89	0.23	0.34	0.36
d, Delay for Lane Group [s/veh]	49.34	48.35	47.04		51.14	4.17	16.10	16.42
Lane Group LOS	D	D	D		D	A	B	B
Critical Lane Group	Yes	No	No		Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.11	6.80	6.33		9.07	1.90	5.02	5.10
50th-Percentile Queue Length [ft/ln]	177.66	169.95	158.18		226.64	47.45	125.56	127.54
95th-Percentile Queue Length [veh/ln]	11.48	11.07	10.45		14.00	3.42	8.70	8.81
95th-Percentile Queue Length [ft/ln]	286.96	276.85	261.31		350.09	85.40	217.44	220.15



**Movement, Approach, & Intersection Results**

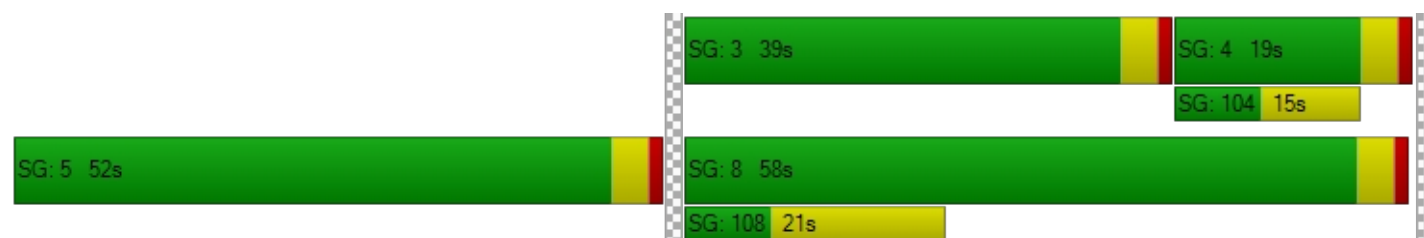
d_M, Delay for Movement [s/veh]	48.94	0.00	47.37	0.00	0.00	0.00	51.14	4.17	0.00	0.00	16.22	16.42
Movement LOS	D		D				D	A			B	B
d_A, Approach Delay [s/veh]	48.28			0.00			19.39			16.26		
Approach LOS	D			A			B			B		
d_I, Intersection Delay [s/veh]	27.42											
Intersection LOS	C											
Intersection V/C	0.565											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.188	1.852	0.000	0.000
Crosswalk LOS	B	A	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	982	273
d_b, Bicycle Delay [s]	55.00	55.00	14.25	41.02
I_b,int, Bicycle LOS Score for Intersection	5.344	4.132	2.362	2.114
Bicycle LOS	F	D	B	B

**Sequence**

Ring 1	-	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 15: Lemon Street at Wilshire Avenue**

Control Type:	Signalized	Delay (sec / veh):	3.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.225

**Intersection Setup**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Wilshire Avenue			Wilshire Avenue		
Base Volume Input [veh/h]	19	395	12	10	709	6	7	5	16	3	9	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	395	12	10	709	6	7	5	16	3	9	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	99	3	3	177	2	2	1	4	1	2	2
Total Analysis Volume [veh/h]	19	395	12	10	709	6	7	5	16	3	9	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	81	0	0	81	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	12	0	0	18	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	98	98	98	98	98	98	3	3
g / C, Green / Cycle	0.90	0.90	0.90	0.90	0.90	0.90	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.11	0.11	0.01	0.19	0.19	0.02	0.01
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1590	1701	1612	1612	1701	1612	98	95
d1, Uniform Delay [s]	0.61	0.67	0.67	0.60	0.74	0.74	52.34	52.10
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.15	0.16	0.01	0.29	0.31	1.58	1.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.01	0.12	0.12	0.01	0.22	0.22	0.29	0.21
d, Delay for Lane Group [s/veh]	0.62	0.82	0.83	0.61	1.04	1.05	53.92	53.20
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.01	0.14	0.14	0.01	0.28	0.27	0.80	0.57
50th-Percentile Queue Length [ft/ln]	0.30	3.53	3.41	0.15	6.88	6.67	20.06	14.22
95th-Percentile Queue Length [veh/ln]	0.02	0.25	0.25	0.01	0.50	0.48	1.44	1.02
95th-Percentile Queue Length [ft/ln]	0.53	6.36	6.14	0.28	12.38	12.01	36.10	25.59

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	0.62	0.83	0.83	0.61	1.04	1.05	53.92	53.92	53.92	53.20	53.20	53.20
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	0.82			1.04			53.92			53.20		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	3.06											
Intersection LOS	A											
Intersection V/C	0.225											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.539			2.541			1.782			1.762		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1400			1400			455			455		
d_b, Bicycle Delay [s]	4.95			4.95			32.84			32.84		
I_b,int, Bicycle LOS Score for Intersection	1.911			2.158			1.606			1.593		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 16: Harbor Boulevard at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	105	652	128	67	887	99	92	289	123	183	325	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	652	128	67	887	99	92	289	123	183	325	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	163	32	17	222	25	23	72	31	46	81	15
Total Analysis Volume [veh/h]	105	652	128	67	887	99	92	289	123	183	325	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	57	0	10	57	0	13	33	0	10	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	20	0	0	22	0	0	17	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	33	33	33	59	47	47	59	49	49
g / C, Green / Cycle	0.20	0.20	0.20	0.30	0.30	0.30	0.53	0.42	0.42	0.53	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.17	0.07	0.04	0.27	0.26	0.05	0.08	0.07	0.10	0.09	0.03
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	1800	3800	1800
c, Capacity [veh/h]	231	776	367	408	575	545	957	1602	759	966	1689	800
d1, Uniform Delay [s]	37.03	42.09	37.54	27.81	36.74	36.26	12.65	19.93	19.77	13.36	18.57	17.56
k, delay calibration	0.11	0.11	0.11	0.11	0.14	0.13	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.40	2.55	0.56	0.19	6.75	4.98	0.04	0.25	0.46	0.44	0.25	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.45	0.84	0.35	0.16	0.90	0.86	0.10	0.18	0.16	0.19	0.19	0.07
d, Delay for Lane Group [s/veh]	38.43	44.65	38.10	28.00	43.49	41.24	12.69	20.18	20.23	13.80	18.82	17.74
Lane Group LOS	D	D	D	C	D	D	B	C	C	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.48	8.72	3.01	1.30	14.12	12.51	1.11	2.36	2.05	2.43	2.56	0.90
50th-Percentile Queue Length [ft/ln]	62.05	217.94	75.35	32.62	352.90	312.74	27.85	59.10	51.14	60.84	63.97	22.44
95th-Percentile Queue Length [veh/ln]	4.47	13.56	5.43	2.35	20.28	18.31	2.01	4.26	3.68	4.38	4.61	1.62
95th-Percentile Queue Length [ft/ln]	111.68	338.99	135.63	58.71	506.94	457.75	50.13	106.38	92.06	109.50	115.14	40.40



**Movement, Approach, & Intersection Results**

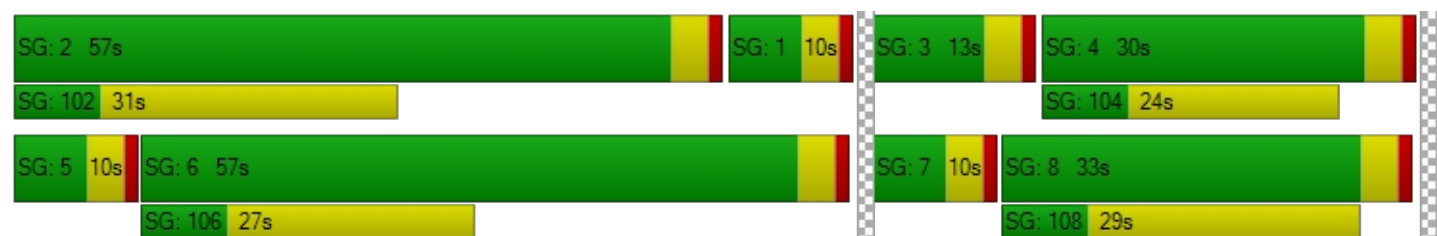
d_M, Delay for Movement [s/veh]	38.43	44.65	38.10	28.00	42.55	41.24	12.69	20.18	20.23	13.80	18.82	17.74
Movement LOS	D	D	D	C	D	D	B	C	C	B	B	B
d_A, Approach Delay [s/veh]	42.96			41.50			18.82			17.09		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	33.53											
Intersection LOS	C											
Intersection V/C	0.532											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.915			2.732			2.650			2.709		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	964			964			527			473		
d_b, Bicycle Delay [s]	14.77			14.77			29.82			32.07		
I_b,int, Bicycle LOS Score for Intersection	2.290			2.428			1.975			2.027		
Bicycle LOS	B			B			A			B		

**Sequence**


Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 17: Lemon Street at Commonwealth Avenue**

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.428

**Intersection Setup**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Commonwealth Avenue			Commonwealth Avenue		
Base Volume Input [veh/h]	88	307	129	30	658	83	58	350	88	78	266	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	88	307	129	30	658	83	58	350	88	78	266	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	77	32	8	165	21	15	88	22	20	67	9
Total Analysis Volume [veh/h]	88	307	129	30	658	83	58	350	88	78	266	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	53	0	15	52	0	12	31	0	11	30	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	0	23	0	0	19	0	0	19	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	12	12	26	26	26	5	56	56	5	57	57
g / C, Green / Cycle	0.11	0.11	0.11	0.24	0.23	0.23	0.05	0.51	0.51	0.05	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.07	0.02	0.20	0.20	0.03	0.09	0.05	0.02	0.07	0.02
s, saturation flow rate [veh/h]	1800	3800	1800	1800	1900	1800	1800	3800	1800	3500	3800	1800
c, Capacity [veh/h]	242	411	195	465	442	419	83	1940	919	176	1956	927
d1, Uniform Delay [s]	46.04	47.64	47.17	32.42	40.73	40.34	51.75	14.52	13.86	50.77	13.94	13.21
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.92	2.73	3.83	0.06	5.70	4.70	10.02	0.20	0.21	1.73	0.14	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.36	0.75	0.66	0.06	0.88	0.84	0.70	0.18	0.10	0.44	0.14	0.04
d, Delay for Lane Group [s/veh]	46.96	50.38	51.01	32.48	46.43	45.04	61.77	14.73	14.07	52.51	14.08	13.29
Lane Group LOS	D	D	D	C	D	D	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.32	4.23	3.60	0.64	10.73	9.59	1.81	2.38	1.17	1.09	1.74	0.43
50th-Percentile Queue Length [ft/ln]	57.96	105.72	89.91	15.89	268.16	239.87	45.17	59.41	29.18	27.15	43.58	10.80
95th-Percentile Queue Length [veh/ln]	4.17	7.60	6.47	1.14	16.10	14.67	3.25	4.28	2.10	1.95	3.14	0.78
95th-Percentile Queue Length [ft/ln]	104.32	190.04	161.84	28.59	402.44	366.87	81.31	106.94	52.53	48.87	78.45	19.44

**Movement, Approach, & Intersection Results**

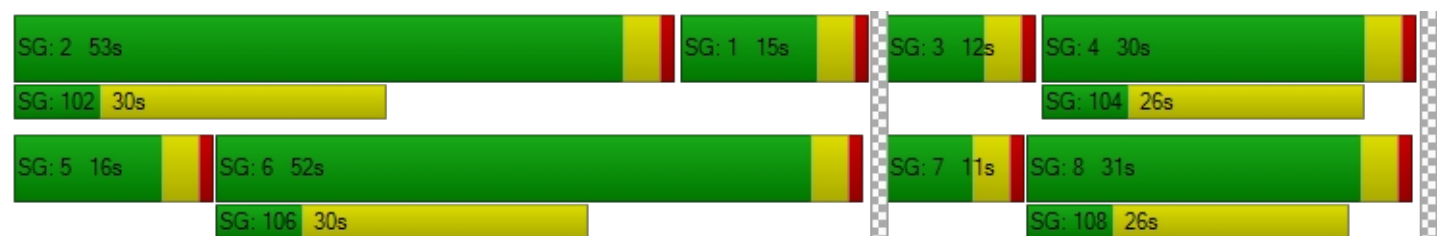
d_M, Delay for Movement [s/veh]	46.96	50.38	51.01	32.48	45.86	45.04	61.77	14.73	14.07	52.51	14.08	13.29
Movement LOS	D	D	D	C	D	D	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	49.96			45.25			20.11			21.94		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	36.58											
Intersection LOS	D											
Intersection V/C	0.428											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.681			2.538			2.618			2.760		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			873			491			473		
d_b, Bicycle Delay [s]	16.91			17.47			31.31			32.07		
I_b,int, Bicycle LOS Score for Intersection	1.992			2.196			1.969			1.871		
Bicycle LOS	A			B			A			A		

**Sequence**





Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 18: Harbor Boulevard at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	6.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.380

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	31	905	25	24	1077	31	22	44	26	52	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	905	25	24	1077	31	22	44	26	52	39	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	226	6	6	269	8	6	11	7	13	10	4
Total Analysis Volume [veh/h]	31	905	25	24	1077	31	22	44	26	52	39	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	77	0	0	77	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	11	0	0	20	0	0	18	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	L	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	95	95	95	95	95	95	7	7	7
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.25	0.01	0.30	0.30	0.05	0.03	0.03
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800	1800
c, Capacity [veh/h]	1460	1637	1551	1484	1637	1551	159	70	118
d1, Uniform Delay [s]	1.07	1.41	1.41	1.07	1.51	1.50	50.52	49.36	49.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.46	0.47	0.02	0.59	0.61	3.30	14.54	2.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.02	0.29	0.29	0.02	0.35	0.35	0.58	0.75	0.45
d, Delay for Lane Group [s/veh]	1.10	1.87	1.88	1.09	2.10	2.11	53.82	63.90	52.03
Lane Group LOS	A	A	A	A	A	A	D	E	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.05	1.07	1.01	0.04	1.37	1.29	2.63	1.65	1.49
50th-Percentile Queue Length [ft/ln]	1.33	26.72	25.25	1.02	34.15	32.24	65.81	41.37	37.18
95th-Percentile Queue Length [veh/ln]	0.10	1.92	1.82	0.07	2.46	2.32	4.74	2.98	2.68
95th-Percentile Queue Length [ft/ln]	2.39	48.10	45.46	1.84	61.46	58.02	118.45	74.46	66.92



**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.10	1.87	1.88	1.09	2.11	2.11	53.82	53.82	53.82	63.90	52.03	52.03
Movement LOS	A	A	A	A	A	A	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	1.85			2.08			53.82			57.91		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	6.62											
Intersection LOS	A											
Intersection V/C	0.380											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.796			2.745			1.863			2.048		
Crosswalk LOS	C			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1327			1327			527			527		
d_b, Bicycle Delay [s]	6.22			6.22			29.82			29.82		
I_b,int, Bicycle LOS Score for Intersection	2.352			2.494			1.711			1.733		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 19: Lemon Street at Valencia Drive**

Control Type:	Signalized	Delay (sec / veh):	7.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

**Intersection Setup**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Valencia Drive			Valencia Drive		
Base Volume Input [veh/h]	63	547	39	35	731	39	28	27	45	49	20	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	547	39	35	731	39	28	27	45	49	20	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	137	10	9	183	10	7	7	11	12	5	7
Total Analysis Volume [veh/h]	63	547	39	35	731	39	28	27	45	49	20	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	25	0	0	25	0	0	85	0	0	85	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	94	94	94	94	94	94	8	8
g / C, Green / Cycle	0.86	0.86	0.86	0.86	0.86	0.86	0.07	0.07
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.16	0.02	0.21	0.21	0.06	0.05
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1800	1800	1800
c, Capacity [veh/h]	1486	1626	1541	1507	1626	1541	170	178
d1, Uniform Delay [s]	1.18	1.36	1.35	1.16	1.44	1.44	50.16	50.04
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.25	0.26	0.03	0.36	0.37	3.20	2.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.04	0.19	0.18	0.02	0.25	0.24	0.59	0.54
d, Delay for Lane Group [s/veh]	1.23	1.61	1.61	1.19	1.80	1.81	53.36	52.58
Lane Group LOS	A	A	A	A	A	A	D	D
Critical Lane Group	No	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	0.66	0.62	0.07	0.93	0.87	2.85	2.71
50th-Percentile Queue Length [ft/ln]	3.02	16.55	15.43	1.65	23.14	21.63	71.22	67.72
95th-Percentile Queue Length [veh/ln]	0.22	1.19	1.11	0.12	1.67	1.56	5.13	4.88
95th-Percentile Queue Length [ft/ln]	5.44	29.80	27.78	2.96	41.64	38.94	128.19	121.89

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	1.23	1.61	1.61	1.19	1.80	1.81	53.36	53.36	53.36	52.58	52.58	52.58
Movement LOS	A	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	1.58			1.78			53.36			52.58		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.78											
Intersection LOS	A											
Intersection V/C	0.286											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.667			2.624			1.922			1.870		
Crosswalk LOS	B			B			A			A		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	382			382			1473			1473		
d_b, Bicycle Delay [s]	36.00			36.00			3.82			3.82		
I_b,int, Bicycle LOS Score for Intersection	2.095			2.224			1.725			1.718		
Bicycle LOS	B			B			A			A		

**Sequence**

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



### Intersection Level Of Service Report

#### Intersection 20: Harbor Boulevard at Orangethorpe Avenue

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

#### Intersection Setup

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

#### Volumes

Name	Harbor Boulevard			Harbor Boulevard			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	134	798	127	131	1079	132	153	313	138	210	500	165
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	134	798	127	131	1079	132	153	313	138	210	500	165
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	200	32	33	270	33	38	78	35	53	125	41
Total Analysis Volume [veh/h]	134	798	127	131	1079	132	153	313	138	210	500	165
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	51	0	10	51	0	12	39	0	10	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	27	0	0	27	0	0	28	0	0	26	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	27	27	12	33	33	11	40	40	15	44	44
g / C, Green / Cycle	0.05	0.24	0.24	0.11	0.30	0.30	0.10	0.37	0.37	0.13	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.07	0.04	0.26	0.12	0.09	0.05	0.08	0.12	0.09	0.09
s, saturation flow rate [veh/h]	3500	3800	1800	3500	3800	1800	1800	5700	1800	1800	5700	1800
c, Capacity [veh/h]	194	923	437	386	1132	536	186	2091	660	242	2271	717
d1, Uniform Delay [s]	51.08	39.95	33.95	45.27	36.68	30.98	48.40	23.35	23.90	46.67	21.84	21.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.37	2.58	0.36	0.52	2.28	0.51	8.85	0.15	0.72	9.06	0.22	0.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.69	0.86	0.29	0.34	0.87	0.42	0.82	0.15	0.21	0.87	0.22	0.23
d, Delay for Lane Group [s/veh]	55.45	42.53	34.32	45.79	38.96	31.49	57.24	23.50	24.62	55.73	22.06	22.68
Lane Group LOS	E	D	C	D	D	C	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.93	10.57	2.81	1.68	12.77	4.80	4.56	1.85	2.59	6.21	2.88	2.96
50th-Percentile Queue Length [ft/ln]	48.23	264.20	70.34	42.07	319.25	120.02	113.99	46.14	64.76	155.35	71.90	74.05
95th-Percentile Queue Length [veh/ln]	3.47	15.90	5.06	3.03	18.63	8.39	8.06	3.32	4.66	10.30	5.18	5.33
95th-Percentile Queue Length [ft/ln]	86.82	397.49	126.62	75.73	465.77	209.85	201.54	83.05	116.58	257.55	129.42	133.28



**Movement, Approach, & Intersection Results**

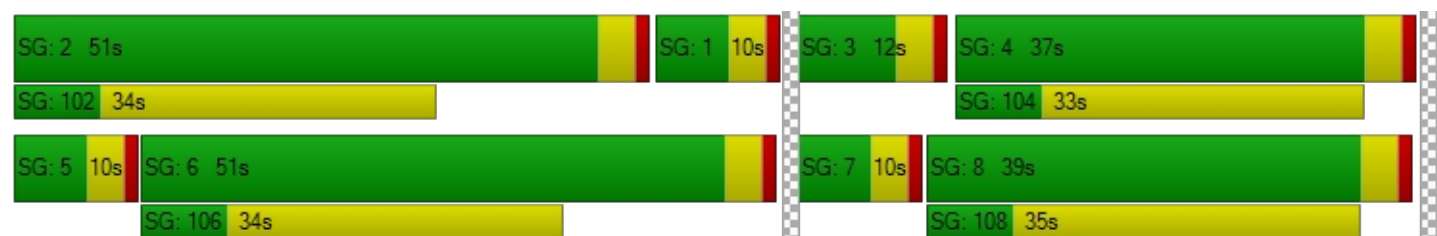
d_M, Delay for Movement [s/veh]	55.45	42.53	34.32	45.79	38.33	31.49	57.24	23.50	24.62	55.73	22.06	22.68
Movement LOS	E	D	C	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	43.18			38.39			32.30			30.26		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	36.91											
Intersection LOS	D											
Intersection V/C	0.575											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	3.038			2.946			2.902			2.911		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			855			636			600		
d_b, Bicycle Delay [s]	18.04			18.04			25.57			26.95		
I_b,int, Bicycle LOS Score for Intersection	2.433			2.298			1.892			2.041		
Bicycle LOS	B			B			A			B		

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 21: Lemon Street at Orangethorpe Avenue**

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.508

**Intersection Setup**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Orangethorpe Avenue			Orangethorpe Avenue		
Base Volume Input [veh/h]	195	496	52	90	785	80	94	468	203	79	341	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	195	496	52	90	785	80	94	468	203	79	341	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	124	13	23	196	20	24	117	51	20	85	15
Total Analysis Volume [veh/h]	195	496	52	90	785	80	94	468	203	79	341	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	41	0	25	56	0	10	34	0	10	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	26	0	0	25	0	0	20	0	0	23	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	18	18	36	26	26	7	56	56	6	54	54
g / C, Green / Cycle	0.33	0.16	0.16	0.33	0.24	0.24	0.07	0.51	0.51	0.05	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.11	0.13	0.03	0.05	0.21	0.04	0.05	0.12	0.11	0.02	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1800	1800	3800	1800	1800	3800	1800	3500	1900	1800
c, Capacity [veh/h]	244	609	289	376	912	432	122	1934	916	177	934	885
d1, Uniform Delay [s]	27.58	44.64	39.97	25.89	40.07	33.27	50.47	15.14	14.97	50.78	16.01	15.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.98	2.71	0.30	0.32	2.53	0.20	9.72	0.30	0.56	1.76	0.56	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.80	0.81	0.18	0.24	0.86	0.19	0.77	0.24	0.22	0.45	0.23	0.22
d, Delay for Lane Group [s/veh]	33.56	47.35	40.26	26.21	42.59	33.47	60.19	15.44	15.53	52.54	16.57	16.49
Lane Group LOS	C	D	D	C	D	C	E	B	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.25	6.73	1.24	1.70	10.39	1.73	2.87	3.31	2.91	1.10	3.14	2.84
50th-Percentile Queue Length [ft/ln]	106.17	168.25	31.10	42.45	259.72	43.21	71.77	82.71	72.76	27.51	78.40	71.10
95th-Percentile Queue Length [veh/ln]	7.63	10.98	2.24	3.06	15.67	3.11	5.17	5.96	5.24	1.98	5.65	5.12
95th-Percentile Queue Length [ft/ln]	190.67	274.62	55.99	76.42	391.87	77.79	129.19	148.88	130.97	49.51	141.13	127.98

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	33.56	47.35	40.26	26.21	42.59	33.47	60.19	15.44	15.53	52.54	16.54	16.49
Movement LOS	C	D	D	C	D	C	E	B	B	D	B	B
d_A, Approach Delay [s/veh]	43.23			40.28			20.96			22.45		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.09											
Intersection LOS	C											
Intersection V/C	0.508											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	2.757			2.723			2.799			2.852		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	673			945			545			545		
d_b, Bicycle Delay [s]	24.22			15.29			29.09			29.09		
I_b,int, Bicycle LOS Score for Intersection	2.173			2.347			1.980			1.956		
Bicycle LOS	B			B			A			A		

**Sequence**




Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 22: Harbor Boulevard at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.549

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	115	910	0	0	1019	569	0	0	0	148	372	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	910	0	0	1019	569	0	0	0	148	372	242
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	228	0	0	255	142	0	0	0	37	93	61
Total Analysis Volume [veh/h]	115	910	0	0	1019	569	0	0	0	148	372	242
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	10	37	0	0	27	0	0	0	0	0	63	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	21	0	0	11	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		L	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	6	75	65	65		17	17	17
g / C, Green / Cycle	0.06	0.75	0.65	0.65		0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.27	0.32		0.08	0.10	0.13
s, saturation flow rate [veh/h]	3500	5700	3800	1800		1800	3800	1800
c, Capacity [veh/h]	205	4287	2483	1176		302	638	302
d1, Uniform Delay [s]	45.83	3.66	8.20	8.78		37.72	38.37	39.99
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	2.41	0.11	0.50	1.42		1.23	0.85	4.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.56	0.21	0.41	0.48		0.49	0.58	0.80
d, Delay for Lane Group [s/veh]	48.24	3.77	8.71	10.20		38.94	39.22	44.88
Lane Group LOS	D	A	A	B		D	D	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.45	1.49	4.86	6.06		3.37	4.25	6.07
50th-Percentile Queue Length [ft/ln]	36.32	37.24	121.39	151.53		84.13	106.16	151.67
95th-Percentile Queue Length [veh/ln]	2.61	2.68	8.47	10.10		6.06	7.63	10.11
95th-Percentile Queue Length [ft/ln]	65.37	67.04	211.74	252.47		151.44	190.64	252.66



**Movement, Approach, & Intersection Results**

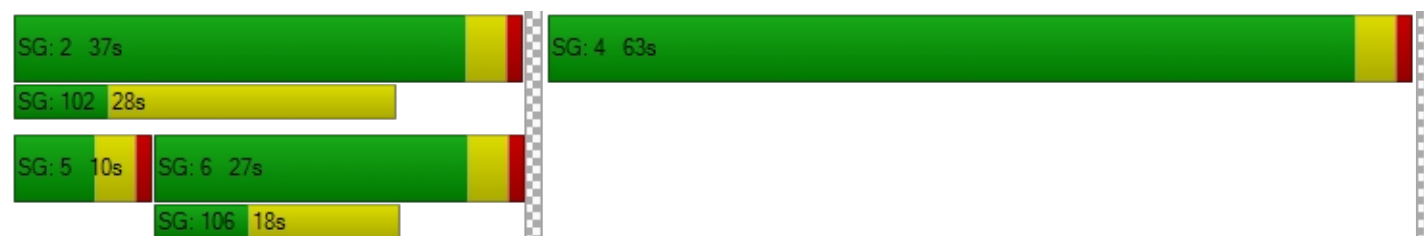
d_M, Delay for Movement [s/veh]	48.24	3.77	0.00	0.00	8.71	10.20	0.00	0.00	0.00	38.94	39.22	44.88
Movement LOS	D	A			A	B				D	D	D
d_A, Approach Delay [s/veh]	8.76			9.24			0.00			40.96		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	16.26											
Intersection LOS	B											
Intersection V/C	0.549											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.234			2.322		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	660			460			0			1180		
d_b, Bicycle Delay [s]	22.45			29.65			50.00			8.41		
I_b,int, Bicycle LOS Score for Intersection	2.123			2.433			4.132			2.188		
Bicycle LOS	B			B			D			B		

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 23: Lemon Street at SR-91 WB Ramps**

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 WB Ramps			SR-91 WB Ramps		
Base Volume Input [veh/h]	48	379	0	0	851	332	0	0	0	110	375	473
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	379	0	0	851	332	0	0	0	110	375	473
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	95	0	0	213	83	0	0	0	28	94	118
Total Analysis Volume [veh/h]	48	379	0	0	851	332	0	0	0	110	375	473
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	0	0	0	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	6	6	0	0	6	0	0	0	0	0	6	0
Maximum Green [s]	30	30	0	0	30	0	0	0	0	0	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Split [s]	11	54	0	0	43	0	0	0	0	0	46	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	15	0	0	12	0	0	0	0	0	0	0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No			No						No	
Maximum Recall	No	No			No						No	
Pedestrian Recall	No	No			No						No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C		C	C	R
C, Cycle Length [s]	100	100	100	100		100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00		4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00		2.00	2.00	2.00
g_i, Effective Green Time [s]	4	62	54	54		30	30	30
g / C, Green / Cycle	0.04	0.62	0.54	0.54		0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.07	0.21	0.22		0.14	0.13	0.26
s, saturation flow rate [veh/h]	1800	5700	3800	1800		1800	1900	1800
c, Capacity [veh/h]	81	3561	2050	971		531	561	531
d1, Uniform Delay [s]	46.84	7.54	13.38	13.58		28.74	28.43	33.69
k, delay calibration	0.11	0.50	0.50	0.50		0.11	0.11	0.18
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00
d2, Incremental Delay [s]	6.64	0.06	0.55	1.26		0.62	0.52	8.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.59	0.11	0.38	0.41		0.46	0.43	0.89
d, Delay for Lane Group [s/veh]	53.48	7.60	13.93	14.84		29.36	28.95	42.29
Lane Group LOS	D	A	B	B		C	C	D
Critical Lane Group	Yes	No	No	Yes		No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.32	1.04	5.08	5.34		4.82	4.67	11.98
50th-Percentile Queue Length [ft/ln]	32.91	26.01	126.96	133.38		120.48	116.83	299.50
95th-Percentile Queue Length [veh/ln]	2.37	1.87	8.77	9.12		8.42	8.22	17.66
95th-Percentile Queue Length [ft/ln]	59.25	46.81	219.36	228.09		210.48	205.46	441.41

**Movement, Approach, & Intersection Results**

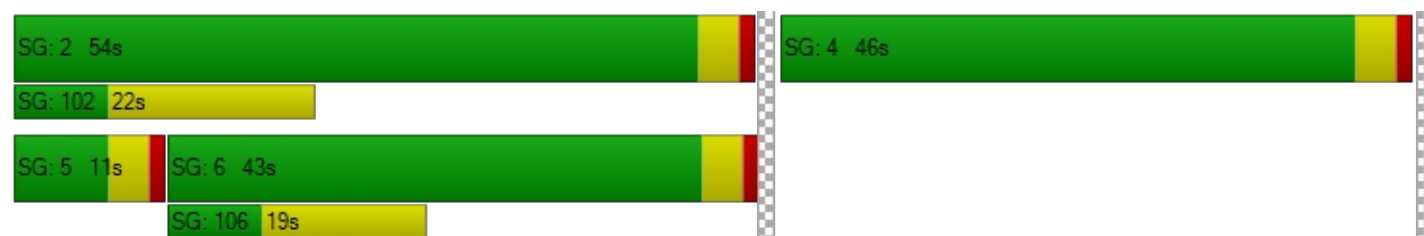
d_M, Delay for Movement [s/veh]	53.48	7.60	0.00	0.00	13.99	14.84	0.00	0.00	0.00	29.36	29.10	42.29
Movement LOS	D	A			B	B				C	C	D
d_A, Approach Delay [s/veh]	12.76			14.23			0.00			35.64		
Approach LOS	B			B			A			D		
d_I, Intersection Delay [s/veh]	21.97											
Intersection LOS	C											
Intersection V/C	0.578											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0				0.0				11.0		11.0	
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00				0.00				0.00		0.00	
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00				0.00				0.00		0.00	
d_p, Pedestrian Delay [s]	0.00				0.00				39.61		39.61	
I_p,int, Pedestrian LOS Score for Intersection	0.000				0.000				2.088		2.256	
Crosswalk LOS	F				F				B		B	
s_b, Saturation Flow Rate of the bicycle lane	2000				2000				2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	1000				780				0		840	
d_b, Bicycle Delay [s]	12.50				18.61				50.00		16.82	
I_b,int, Bicycle LOS Score for Intersection	1.794				2.210				4.132		2.350	
Bicycle LOS	A				B				D		B	

**Sequence**




Ring 1	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 24: Harbor Boulevard at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	21.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.375

**Intersection Setup**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Harbor Boulevard			Harbor Boulevard			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	580	174	321	805	0	477	150	147	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	580	174	321	805	0	477	150	147	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	145	44	80	201	0	119	38	37	0	0	0
Total Analysis Volume [veh/h]	0	580	174	321	805	0	477	150	147	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	29	0	51	80	0	0	20	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	18	0	0	20	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	R	L	C	L	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	61	61	12	76	16	16	16	
g / C, Green / Cycle	0.61	0.61	0.12	0.76	0.16	0.16	0.16	
(v / s)_i Volume / Saturation Flow Rate	0.10	0.10	0.09	0.14	0.14	0.08	0.08	
s, saturation flow rate [veh/h]	5700	1800	3500	5700	3500	1900	1800	
c, Capacity [veh/h]	3454	1091	414	4357	545	296	280	
d1, Uniform Delay [s]	8.65	8.60	42.79	3.23	41.27	38.70	38.82	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.11	0.31	3.13	0.09	4.63	1.34	1.52	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.17	0.16	0.77	0.18	0.88	0.51	0.52	
d, Delay for Lane Group [s/veh]	8.75	8.91	45.91	3.33	45.90	40.04	40.34	
Lane Group LOS	A	A	D	A	D	D	D	
Critical Lane Group	Yes	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.77	1.65	4.00	1.18	6.03	3.46	3.41	
50th-Percentile Queue Length [ft/ln]	44.18	41.16	99.96	29.53	150.79	86.53	85.29	
95th-Percentile Queue Length [veh/ln]	3.18	2.96	7.20	2.13	10.06	6.23	6.14	
95th-Percentile Queue Length [ft/ln]	79.53	74.09	179.93	53.15	251.48	155.75	153.52	



**Movement, Approach, & Intersection Results**

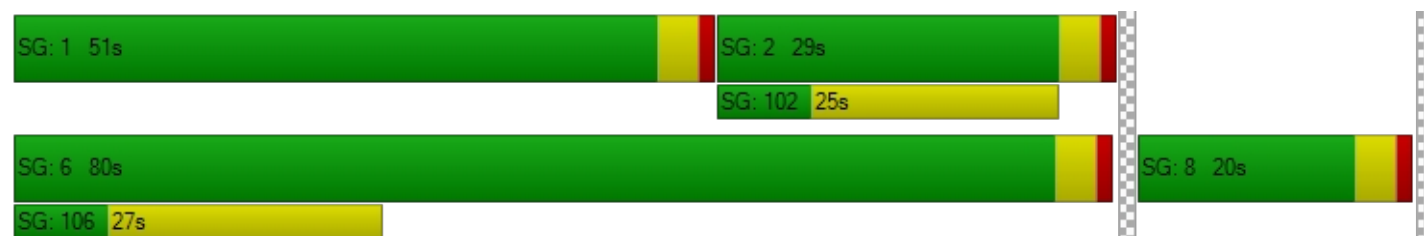
d_M, Delay for Movement [s/veh]	0.00	8.75	8.91	45.91	3.33	0.00	45.90	40.04	40.34	0.00	0.00	0.00
Movement LOS		A	A	D	A		D	D	D			
d_A, Approach Delay [s/veh]	8.79			15.47			43.71			0.00		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	21.81											
Intersection LOS	C											
Intersection V/C	0.375											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.325			2.034		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			1520			320			0		
d_b, Bicycle Delay [s]	28.13			2.88			35.28			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.974			2.179			2.837			4.132		
Bicycle LOS	A			B			C			D		

**Sequence**

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 25: Lemon Street at SR-91 EB Ramps**

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

**Intersection Setup**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			No			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			SR-91 EB Ramps			SR-91 EB Ramps		
Base Volume Input [veh/h]	0	302	187	446	523	0	134	497	38	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	302	187	446	523	0	134	497	38	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	76	47	112	131	0	34	124	10	0	0	0
Total Analysis Volume [veh/h]	0	302	187	446	523	0	134	497	38	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	0	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	0	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Split [s]	0	23	0	20	43	0	0	57	0	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	16	0	0	0	0	0	0	0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Minimum Recall		No		No	No			No				
Maximum Recall		No		No	No			No				
Pedestrian Recall		No		No	No			No				
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	C	C	R	
C, Cycle Length [s]	100	100	100	100	100	100	100	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
g_i, Effective Green Time [s]	53	53	15	71	21	21	21	
g / C, Green / Cycle	0.53	0.53	0.15	0.71	0.21	0.21	0.21	
(v / s)_i Volume / Saturation Flow Rate	0.08	0.10	0.13	0.14	0.18	0.16	0.02	
s, saturation flow rate [veh/h]	3800	1800	3500	3800	1800	1900	1800	
c, Capacity [veh/h]	1999	947	516	2711	372	393	372	
d1, Uniform Delay [s]	12.20	12.54	41.66	4.76	38.25	37.66	32.15	
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.16	0.47	4.50	0.16	5.76	3.69	0.12	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

**Lane Group Results**

X, volume / capacity	0.15	0.20	0.86	0.19	0.86	0.79	0.10	
d, Delay for Lane Group [s/veh]	12.36	13.00	46.16	4.92	44.01	41.35	32.27	
Lane Group LOS	B	B	D	A	D	D	C	
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.73	2.27	5.64	1.60	8.02	7.56	0.76	
50th-Percentile Queue Length [ft/ln]	43.26	56.69	140.98	39.99	200.47	188.90	18.90	
95th-Percentile Queue Length [veh/ln]	3.11	4.08	9.53	2.88	12.66	12.06	1.36	
95th-Percentile Queue Length [ft/ln]	77.87	102.04	238.35	71.98	316.57	301.61	34.01	

**Movement, Approach, & Intersection Results**

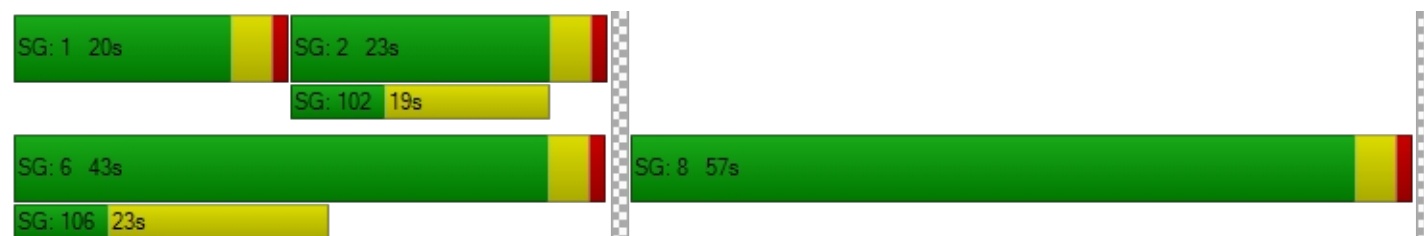
d_M, Delay for Movement [s/veh]	0.00	12.36	13.00	46.16	4.92	0.00	44.01	42.34	32.27	0.00	0.00	0.00
Movement LOS		B	B	D	A		D	D	C			
d_A, Approach Delay [s/veh]	12.61			23.90			42.10			0.00		
Approach LOS	B			C			D			A		
d_I, Intersection Delay [s/veh]	27.03											
Intersection LOS	C											
Intersection V/C	0.464											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersection	0.000			0.000			2.162			2.271		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	380			780			1060			0		
d_b, Bicycle Delay [s]	32.81			18.61			11.05			50.00		
I_b,int, Bicycle LOS Score for Intersection	1.829			2.359			2.112			4.132		
Bicycle LOS	A			B			B			D		

**Sequence**




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 26: Centennial Way at Berkeley Avenue**

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.355

**Intersection Setup**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Centennial Way		Berkeley Avenue		Berkeley Avenue	
Base Volume Input [veh/h]	0	250	337	27	2	367
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	250	337	27	2	367
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	63	84	7	1	92
Total Analysis Volume [veh/h]	0	250	337	27	2	367
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	0


**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.35	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	0.00	12.88	0.00	0.00	8.02	0.00
Movement LOS		B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.60	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	0.00	40.07	0.00	0.00	0.13	0.00
d_A, Approach Delay [s/veh]	12.88		0.00		0.04	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	3.29					
Intersection LOS	B					

**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	554.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	100	3	7	119	0	31	1	48	121	0	8
Total Analysis Volume [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		



**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	30	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	34	0	10	44	0	0	66	0	66	0	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	13	0	0	14	0	0	0	0	16	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No		No	No			No		No		
Maximum Recall		No		No	No			No		No		
Pedestrian Recall		No		No	No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	80	80	88	88	14	14	14	14
g / C, Green / Cycle	0.73	0.73	0.80	0.80	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.01	0.13	0.07	0.11	0.27	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1385	1313	1453	3023	280	270	93	237
d1, Uniform Delay [s]	4.52	4.55	2.33	2.63	44.53	46.50	43.71	42.24
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	0.25	0.00	0.11	1.10	3.65	1913.15	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.15	0.16	0.02	0.16	0.44	0.72	5.24	0.14
d, Delay for Lane Group [s/veh]	4.75	4.81	2.34	2.74	45.64	50.16	1956.86	42.51
Lane Group LOS	A	A	A	A	D	D	F	D
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.32	1.34	0.09	0.95	3.24	5.45	51.50	0.81
50th-Percentile Queue Length [ft/ln]	33.07	33.43	2.25	23.81	80.95	136.26	1287.45	20.33
95th-Percentile Queue Length [veh/ln]	2.38	2.41	0.16	1.71	5.83	9.28	81.05	1.46
95th-Percentile Queue Length [ft/ln]	59.53	60.17	4.05	42.86	145.72	231.98	2026.24	36.59

**Movement, Approach, & Intersection Results**

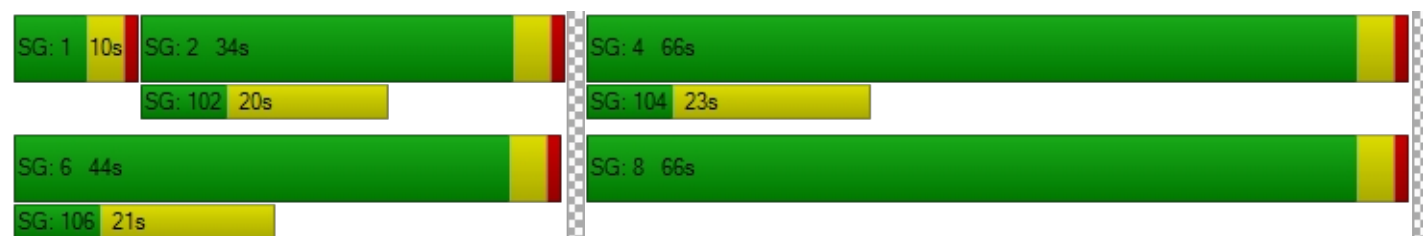
d_M, Delay for Movement [s/veh]	0.00	4.78	4.81	2.34	2.74	0.00	45.64	50.16	50.16	1956.86	0.00	42.51
Movement LOS		A	A	A	A		D	D	D	F		D
d_A, Approach Delay [s/veh]	4.78			2.72			48.40			1834.91		
Approach LOS	A			A			D			F		
d_I, Intersection Delay [s/veh]	554.17											
Intersection LOS	F											
Intersection V/C	0.443											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.692			1.880			2.159		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			727			1127			0		
d_b, Bicycle Delay [s]	29.09			22.27			10.47			55.00		
I_b,int, Bicycle LOS Score for Intersection	1.899			1.973			2.086			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**




Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report****Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Two-way stop	Delay (sec / veh):	47.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.297

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	54	179	446	0	162	383
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	179	446	0	162	383
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	45	112	0	41	96
Total Analysis Volume [veh/h]	54	179	446	0	162	383
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.30	0.63
d_M, Delay for Movement [s/veh]	8.40	0.00	0.00	0.00	47.34	46.62
Movement LOS	A	A	A	A	E	E
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	11.71	11.71
95th-Percentile Queue Length [ft/ln]	3.82	0.00	0.00	0.00	292.75	292.75
d_A, Approach Delay [s/veh]	1.95		0.00		46.84	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	21.22					
Intersection LOS	E					

**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Two-way stop	Delay (sec / veh):	60.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.906

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	45	228	833	0	0	334
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	228	833	0	0	334
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	57	208	0	0	84
Total Analysis Volume [veh/h]	45	228	833	0	0	334
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2




**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.00	0.01	0.00	0.00	0.91
d_M, Delay for Movement [s/veh]	9.77	0.00	0.00	0.00	59.95	60.23
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.18	0.00	0.00	0.00	9.24	9.24
95th-Percentile Queue Length [ft/ln]	4.46	0.00	0.00	0.00	230.99	230.99
d_A, Approach Delay [s/veh]	1.61		0.00		60.23	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	14.28					
Intersection LOS	F					

**Intersection Level Of Service Report**  
**Intersection 30: Berkeley Avenue at Brookdale Place**

Control Type:	Two-way stop	Delay (sec / veh):	20.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		Brookdale Place	
Base Volume Input [veh/h]	243	11	40	1128	17	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	243	11	40	1128	17	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	3	10	282	4	7
Total Analysis Volume [veh/h]	243	11	40	1128	17	27
Pedestrian Volume [ped/h]	0		0		0	



**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.01	0.07	0.03
d_M, Delay for Movement [s/veh]	0.00	0.00	7.83	0.00	19.99	10.47
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.09	0.00	0.33	0.33
95th-Percentile Queue Length [ft/ln]	0.00	0.00	2.36	0.00	8.33	8.33
d_A, Approach Delay [s/veh]	0.00		0.27		14.15	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.64					
Intersection LOS	C					

**Intersection Level Of Service Report****Intersection 31: Lemon Street at Parking Structure**

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

**Intersection Setup**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			No			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			FUHS Driveway			Parking Structure		
Base Volume Input [veh/h]	76	382	54	0	371	21	0	0	126	0	0	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	382	54	0	371	21	0	0	126	0	0	255
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	96	14	0	93	5	0	0	32	0	0	64
Total Analysis Volume [veh/h]	76	382	54	0	371	21	0	0	126	0	0	255
Pedestrian Volume [ped/h]	0			0			0			0		

**Intersection Settings**

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.32
d_M, Delay for Movement [s/veh]	8.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.24	0.00	0.00	11.76
Movement LOS	A	A	A		A	A			B			B
95th-Percentile Queue Length [veh/ln]	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	1.41
95th-Percentile Queue Length [ft/ln]	5.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.68	0.00	0.00	35.25
d_A, Approach Delay [s/veh]	1.23			0.00			10.24			11.76		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	3.83											
Intersection LOS	B											

*APPENDIX O-V*

**YEAR 2020 CUMULATIVE PLUS PROJECT WITH IMPROVEMENTS  
FRIDAY DEPARTURE PEAK HOUR**

**Intersection Level Of Service Report**  
**Intersection 4: Lemon Street at Berkeley Avenue**

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

**Intersection Setup**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Berkeley Avenue			Berkeley Avenue		
Base Volume Input [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	52	39	5	36	9	3	38	32	47	45	13
Total Analysis Volume [veh/h]	279	206	156	18	142	37	11	153	126	187	178	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	0	6	0	0	4	0	0	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	32	0	0	32	0	0	33	0	0	33	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	19	0	0	16	0	0	12	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	65	65	65	65	65	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	48	48	48	9	9	9	9	9	9
g / C, Green / Cycle	0.73	0.73	0.73	0.73	0.73	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.12	0.15	0.09	0.01	0.10	0.01	0.08	0.07	0.10	0.06	0.06
s, saturation flow rate [veh/h]	1800	1800	1800	1800	1800	1800	1900	1800	1800	1900	1800
c, Capacity [veh/h]	1296	1386	1319	1263	1319	235	274	260	206	274	260
d1, Uniform Delay [s]	2.65	2.73	2.55	2.35	2.58	23.96	25.89	25.60	26.57	25.42	25.33
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.31	0.18	0.02	0.21	0.08	1.77	1.40	13.70	1.11	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.17	0.19	0.12	0.01	0.14	0.05	0.56	0.48	0.91	0.44	0.42
d, Delay for Lane Group [s/veh]	2.93	3.03	2.73	2.37	2.80	24.04	27.67	27.00	40.27	26.53	26.40
Lane Group LOS	A	A	A	A	A	C	C	C	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.58	0.71	0.39	0.04	0.46	0.14	2.23	1.81	3.41	1.71	1.53
50th-Percentile Queue Length [ft/ln]	14.59	17.86	9.87	1.05	11.50	3.62	55.77	45.19	85.36	42.70	38.21
95th-Percentile Queue Length [veh/ln]	1.05	1.29	0.71	0.08	0.83	0.26	4.02	3.25	6.15	3.07	2.75
95th-Percentile Queue Length [ft/ln]	26.26	32.16	17.77	1.90	20.71	6.51	100.39	81.34	153.64	76.86	68.77

**Movement, Approach, & Intersection Results**

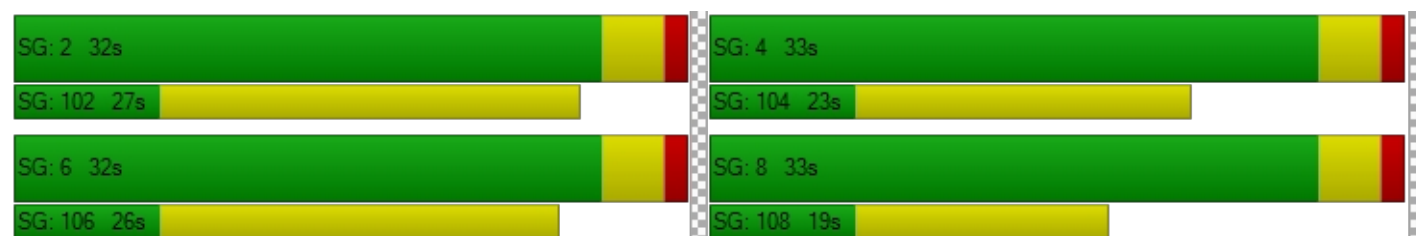
d_M, Delay for Movement [s/veh]	2.95	3.03	2.73	2.37	2.80	2.80	24.04	27.67	27.00	40.27	26.49	26.40
Movement LOS	A	A	A	A	A	A	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	2.92			2.76			27.24			32.68		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	15.49											
Intersection LOS	B											
Intersection V/C	0.286											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	22.43			22.43			22.43			22.43		
I_p,int, Pedestrian LOS Score for Intersection	2.646			2.089			2.864			2.320		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	862			862			892			892		
d_b, Bicycle Delay [s]	10.53			10.53			9.97			9.97		
I_b,int, Bicycle LOS Score for Intersection	2.617			1.885			2.038			1.903		
Bicycle LOS	B			A			B			A		

**Sequence**

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Intersection Level Of Service Report**  
**Intersection 27: Lemon Street at Fullerton College Drive**

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.445

**Intersection Setup**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			Yes			Yes			Yes		

**Volumes**

Name	Lemon Street			Lemon Street			Fullerton College Drive			Fullerton College Drive		
Base Volume Input [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	100	3	7	119	0	31	1	48	121	0	8
Total Analysis Volume [veh/h]	0	399	12	26	475	0	124	2	193	485	0	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	2	0	1	6	0	0	8	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	6	0	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	30	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0
Split [s]	0	22	0	0	22	0	0	48	0	48	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	3	0	0	4	0	0	0	0	5	0	0
Rest In Walk		No			No			No		No		
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0
Minimum Recall		No			No			No		No		
Maximum Recall		No			No			No		No		
Pedestrian Recall		No			No			No		No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	C	C	L	C	L	C	L	R
C, Cycle Length [s]	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	41	41	41	21	21	21	21
g / C, Green / Cycle	0.59	0.59	0.59	0.59	0.30	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.01	0.13	0.07	0.11	0.27	0.02
s, saturation flow rate [veh/h]	1900	1800	1800	3800	1800	1800	1800	1800
c, Capacity [veh/h]	1115	1056	913	2230	604	589	491	537
d1, Uniform Delay [s]	6.67	6.72	6.04	6.80	18.44	19.25	23.50	17.49
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.36	0.41	0.06	0.22	0.17	0.33	16.33	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.18	0.19	0.03	0.21	0.21	0.33	0.99	0.06
d, Delay for Lane Group [s/veh]	7.04	7.13	6.10	7.02	18.60	19.58	39.83	17.53
Lane Group LOS	A	A	A	A	B	B	D	B
Critical Lane Group	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.29	1.31	0.15	1.46	1.46	2.40	9.35	0.37
50th-Percentile Queue Length [ft/ln]	32.37	32.77	3.75	36.50	36.43	60.02	233.80	9.20
95th-Percentile Queue Length [veh/ln]	2.33	2.36	0.27	2.63	2.62	4.32	14.37	0.66
95th-Percentile Queue Length [ft/ln]	58.27	58.98	6.75	65.70	65.58	108.03	359.18	16.55

**Movement, Approach, & Intersection Results**

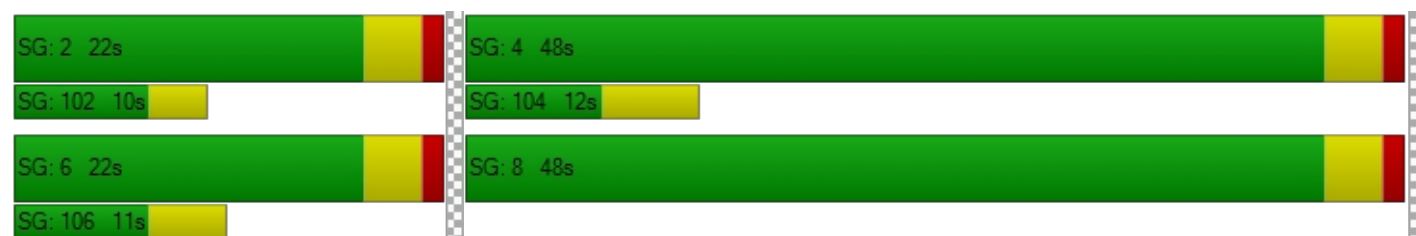
d_M, Delay for Movement [s/veh]	0.00	7.08	7.13	6.10	7.02	0.00	18.60	19.58	19.58	39.83	0.00	17.53
Movement LOS		A	A	A	A		B	B	B	D		B
d_A, Approach Delay [s/veh]	7.08			6.97			19.20			38.41		
Approach LOS	A			A			B			D		
d_I, Intersection Delay [s/veh]	18.54											
Intersection LOS	B											
Intersection V/C	0.445											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			24.86			24.86			24.86		
I_p,int, Pedestrian LOS Score for Intersection	0.000			2.669			1.857			2.145		
Crosswalk LOS	F			B			A			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	514			514			1257			0		
d_b, Bicycle Delay [s]	19.31			19.31			4.83			35.00		
I_b,int, Bicycle LOS Score for Intersection	1.899			1.973			2.086			4.132		
Bicycle LOS	A			A			B			D		

**Sequence**




Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 28: Berkeley Avenue at College Driveway No. 1**

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 1	
Base Volume Input [veh/h]	54	179	446	0	162	383
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	179	446	0	162	383
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	45	112	0	41	96
Total Analysis Volume [veh/h]	54	179	446	0	162	383
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	21
g / C, Green / Cycle	0.52	0.52	0.52	0.35
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.25	0.30
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	709	990	938	623
d1, Uniform Delay [s]	7.11	7.62	9.17	18.44
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.40	1.73	4.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.08	0.18	0.48	0.88
d, Delay for Lane Group [s/veh]	7.32	8.02	10.90	22.52
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.33	1.12	3.47	6.99
50th-Percentile Queue Length [ft/ln]	8.13	27.96	86.86	174.70
95th-Percentile Queue Length [veh/ln]	0.59	2.01	6.25	11.32
95th-Percentile Queue Length [ft/ln]	14.63	50.32	156.36	283.08

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	7.32	8.02	10.90	10.90	22.52	22.52
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	7.86		10.90		22.52	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	15.50					
Intersection LOS	B					
Intersection V/C	0.635					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.517	4.868	5.032
Bicycle LOS	E	E	F

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-








**Intersection Level Of Service Report**  
**Intersection 29: Berkeley Avenue at College Driveway No. 2**

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

**Intersection Setup**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

**Volumes**

Name	Berkeley Avenue		Berkeley Avenue		College Driveway No. 2	
Base Volume Input [veh/h]	45	228	833	0	0	334
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	228	833	0	0	334
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	57	208	0	0	84
Total Analysis Volume [veh/h]	45	228	833	0	0	334
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

**Phasing & Timing**

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	0	2	6	0	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	10	10	0	50	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	C
C, Cycle Length [s]	60	60	60	60
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	38	38	38	14
g / C, Green / Cycle	0.64	0.64	0.64	0.23
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.46	0.19
s, saturation flow rate [veh/h]	1800	1900	1800	1800
c, Capacity [veh/h]	637	1216	1152	408
d1, Uniform Delay [s]	3.99	4.42	7.24	22.07
k, delay calibration	0.50	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.34	3.95	4.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.07	0.19	0.72	0.82
d, Delay for Lane Group [s/veh]	4.21	4.76	11.19	26.17
Lane Group LOS	A	A	B	C
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.18	0.92	6.08	4.58
50th-Percentile Queue Length [ft/ln]	4.53	23.00	151.98	114.45
95th-Percentile Queue Length [veh/ln]	0.33	1.66	10.12	8.09
95th-Percentile Queue Length [ft/ln]	8.16	41.39	253.07	202.18

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	4.21	4.76	11.19	11.19	26.17	26.17
Movement LOS	A	A	B	B	C	C
d_A, Approach Delay [s/veh]	4.67		11.19		26.17	
Approach LOS	A		B		C	
d_I, Intersection Delay [s/veh]	13.43					
Intersection LOS	B					
Intersection V/C	0.748					

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	30.00	30.00	30.00
I_b,int, Bicycle LOS Score for Intersection	4.583	5.507	4.684
Bicycle LOS	E	F	E

**Sequence**

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





# **APPENDIX G**

## *Cultural Resources Report*



**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR,  
City of Fullerton, Orange County, California**

*Prepared for:*

**North Orange County Community College District**

1830A West Romneya Drive  
Anaheim, California 92801

*Contact: Richard Williams, District Director Facilities Planning and Construction*

*Prepared by:*

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**DUDEK**

38 North Marengo Avenue  
Pasadena, California 91101

**AUGUST 2017**





# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page No.</u></b>
<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>IX</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>XI</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 Project Location .....	1
1.2 Project Description.....	1
1.2.1 Introduction.....	1
1.2.2 Facilities Master Plan Elements.....	2
1.3 Regulatory Setting .....	21
1.3.1 Federal.....	22
1.3.2 State.....	23
1.3.3 Local .....	27
<b>2 BACKGROUND RESEARCH.....</b>	<b>31</b>
2.1 CHRIS Records Search.....	31
2.1.1 Previously Conducted Cultural Resources Studies.....	31
2.1.2 Previously Recorded Cultural Resources.....	33
2.2 Native American Coordination .....	37
2.3 Building Development Research .....	38
<b>3 HISTORIC CONTEXT.....</b>	<b>39</b>
3.1 City of Fullerton Historical Overview .....	41
3.2 Fullerton College Historical Overview .....	43
3.2.1 Fullerton College Beginnings .....	43
3.2.2 The Great Depression and World War II.....	44
3.2.3 Postwar Expansion on Campus.....	45
3.2.4 Politics and Social Change.....	47
3.2.5 Economic Uncertainty .....	47
3.2.6 Diversity and Expansion .....	48
3.3 Campus Development and Expansion .....	48
3.3.1 Original Campus Master Plan (1935–1942) .....	48
3.3.2 Taylor and Conner’s Campus Expansion Master Plan (1953–1965).....	58
3.3.3 Blurock’s Campus Expansion Projects (1965–1984) .....	69
3.3.4 Chapman and Wilshire School Acquisition (1980–1984) .....	72
3.3.5 Chapman Avenue Residential Acquisitions (1980s, 1990s).....	76

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

---

## TABLE OF CONTENTS (CONTINUED)

<b><u>Section</u></b>	<b><u>Page No.</u></b>
3.4 Campus Architectural Styles.....	76
3.4.1 Spanish Colonial Revival (1915–1940) .....	76
3.4.2 Craftsman (1905–1930) .....	78
3.4.3 PWA/WPA Moderne (1933–1944).....	80
3.4.4 Mid-Century Modern (1933–1965) .....	80
3.4.5 New Formalism (1954–1970s) .....	82
3.4.6 International Style (c. 1925–present).....	83
3.5 Campus Architects .....	84
3.5.1 Harry K. Vaughn (1882–1962) .....	84
3.5.2 Ralph D. Cornell (1890–1972) .....	85
3.5.3 Donald Beach Kirby, Architect (1905–1980).....	85
3.5.4 William Henry Taylor, Architect (1912–1995) .....	86
3.5.5 William E. Blurock, Architect (1922–2012).....	87
<b>4 CULTURAL RESOURCES SURVEY .....</b>	<b>89</b>
4.1 Methods.....	89
4.2 Description of Surveyed Resources .....	89
<b>5 SIGNIFICANCE EVALUATIONS.....</b>	<b>111</b>
5.1 Fullerton Junior College Campus Historic District .....	111
5.1.1 NRHP/CRHR Evaluation Criteria .....	117
5.1.2 Local Evaluation Criteria .....	120
5.1.3 Integrity Considerations.....	121
5.1.4 Conclusions.....	123
5.2 Mid-Century Modern Campus Expansion Historic District .....	124
5.2.1 NRHP/CRHR Evaluation Criteria .....	127
5.2.2 Local Evaluation Criteria .....	130
5.2.3 Integrity Considerations.....	131
5.2.4 Conclusions.....	132
5.3 Wilshire Junior High School Historic District.....	133
5.3.1 NRHP/CRHR Evaluation Criteria .....	134
5.3.2 Local Evaluation Criteria.....	138
5.3.3 Integrity Considerations.....	138
5.3.4 Conclusions.....	140
5.4 325–327 North Newell Place .....	141
5.4.1 NRHP/CRHR Evaluation Criteria .....	141

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

---

**TABLE OF CONTENTS (CONTINUED)**

<b><u>Section</u></b>	<b><u>Page No.</u></b>
5.4.2 Local Evaluation Criteria.....	143
5.4.3 Integrity Considerations.....	144
5.4.4 Conclusions.....	145
5.5 420 East Chapman Avenue.....	145
5.5.1 NRHP/CRHR Evaluation Criteria .....	145
5.5.2 Local Evaluation Criteria.....	147
5.5.3 Integrity Considerations.....	149
5.5.4 Conclusions.....	150
5.6 416 East Chapman Avenue.....	150
5.6.1 NRHP/CRHR Evaluation Criteria .....	150
5.6.2 Local Evaluation Criteria.....	152
5.6.3 Integrity Considerations.....	154
5.6.4 Conclusions.....	154
5.7 418 East Chapman Avenue.....	155
5.7.1 NRHP/CRHR Evaluation Criteria .....	155
5.7.2 Local Evaluation Criteria.....	157
5.7.3 Integrity Considerations.....	159
5.7.4 Conclusions.....	159
5.8 409 North Newell Place.....	159
5.8.1 NRHP/CRHR Evaluation Criteria .....	159
5.8.2 Local Evaluation Criteria.....	162
5.8.3 Integrity Considerations.....	163
5.8.4 Conclusions.....	164
5.9 428, 434, and 438 East Chapman Avenue .....	164
<b>6 IMPACTS ANALYSIS.....</b>	<b>165</b>
6.1 Proposed Demolition .....	171
6.2 Proposed Renovations.....	172
6.2.1 Interior Renovations.....	172
6.2.2 ADA Compliance Renovations (Interior and Exterior) .....	173
6.2.3 Exterior Renovations .....	173
6.3 Proposed New Construction .....	174
6.4 Site Improvement Elements.....	175
6.4.1 Parking/Vehicular Entry Improvements .....	175

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

---

## TABLE OF CONTENTS (CONTINUED)

<b><u>Section</u></b>	<b><u>Page No.</u></b>
6.4.2 Pedestrian Circulation.....	176
6.4.3 Infrastructure Improvements.....	176
6.5 Recommended Mitigation.....	176
<b>7 SUMMARY AND MANAGEMENT RECOMMENDATIONS .....</b>	<b>179</b>
7.1 Summary of Findings.....	179
7.1.1 Built Environment.....	179
7.1.2 Archaeology.....	180
7.2 Management Recommendations.....	180
7.2.1 Built Environment Resources .....	180
7.2.3 Archaeological Resources.....	180
<b>8 REFERENCES.....</b>	<b>183</b>

## APPENDICES

- A Records Search Results
- B NAHC and Native American Coordination
- C Preparers' Qualifications

## TABLES

1	Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site.....	31
2	Previously Recorded Cultural Resources within 0.5 Miles of the Project Site .....	34
3	Fullerton College Campus Buildings and Structures Surveyed.....	90
4	Inventory of Buildings within the Potential Fullerton Junior College Campus Historic District.....	112
5	Inventory of Buildings within the Potential Mid-Century Modern Campus Expansion Historic District.....	124
6	Inventory of Buildings within the Potential Wilshire Junior High School Historic District.....	133
7	Summary of Impacts and Mitigation .....	165

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

---

## TABLE OF CONTENTS (CONTINUED)

### Page No.

### FIGURES

1	Regional Map.....	3
2	Local Vicinity Map.....	5
3	Existing Campus Land Uses.....	7
4	Proposed Campus Land Uses.....	9
5	Proposed Demolition .....	17
6	Vaughn’s preliminary campus plan .....	50
7	Aerial photograph from 1940 showing the FJC Campus and Vaughn’s many accomplishments during his time with FJC (Richey et al. 2012) .....	51
8	1939 photo of Commerce building .....	52
9	Administration and Social Sciences building constructed in 1938.....	53
10	Technical Trades building constructed in 1937 .....	54
11	Interior of Greenhouse, c. 1937 .....	55
12	Student Union building under construction in 1939 .....	56
13	1940 Aerial photograph showing the second phase of construction on the Student Union building.....	57
14	T Shacks used for classroom spaces starting in 1946.....	58
15	Science building, 1955.....	60
16	Gymnasium building constructed in 1955 .....	61
17	Library constructed in 1957 and demolished in 2003.....	62
18	Student Center constructed in 1957 and demolished in 2007.....	63
19	Technical Education building constructed in 1959.....	64
20	Art–Home Economics building view from top of Gymnasium.....	65
21	District Administration building constructed in 1960 .....	66
22	Applied Arts building constructed in 1962.....	67
23	Music building constructed in 1967.....	68
24	Theatre building constructed in 1967 .....	69
25	Child Development Center Complex.....	70
26	Math Audio–Tutorial building constructed c. 1970.....	71
27	Pedestrian Bridge and Student Center constructed in 1984.....	72
28	1938 Aerial photograph looking southeast, showing the Wilshire School buildings (circled) to the south of the FJC Campus and Fullerton Union High School campus .....	74
29	Wilshire Theatre.....	75

Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR

---

TABLE OF CONTENTS (CONTINUED)

	<u>Page No.</u>
30 Wilshire School Building 1 .....	75
31 Overview of Historic Districts on Campus .....	113
32 Fullerton Junior College Campus Historic District .....	115
33 Mid-Century Modern Campus Expansion Historic District .....	125
34 Wilshire Junior High School Historic District.....	135

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ADA	Americans with Disabilities Act
AIA	American Institute of Architects
ASF	assignable square feet
CEQA	California Environmental Quality Act
CFBD	City of Fullerton Development Services Department Building Division
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
FHA	Federal Housing Administration
FJC	Fullerton Junior College
GSF	gross square feet
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
PRC	California Public Resources Code
Program EIR	Program Environmental Impact Report
PWA	Public Works Administration
SCCIC	South Central Coastal Information Center
WPA	Works Progress Administration
WWII	World War II



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Fullerton College Facilities Master Plan Program EIR**

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## EXECUTIVE SUMMARY

Dudek was retained by the North Orange County Community College District (District) to conduct a cultural resources study for the Fullerton College Facilities Master Plan (proposed project) Program Environmental Impact Report (EIR).

The cultural resources study included a records search of the proposed project site plus a 0.5-mile radius; Native American coordination; a pedestrian survey of the project site for cultural resources; archival and building development research for buildings located within the project site; evaluation of buildings for the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and City of Fullerton historical landmark eligibility criteria and integrity requirements; and an assessment of impacts to historical resources in compliance with the California Environmental Quality Act (CEQA).

All buildings and structures on campus that were built at least 45 years ago or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA.

As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area:

- **Fullerton Junior College Campus Historic District.** The original 1930s–1940s Fullerton Junior College Campus appears to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3, as well as City of Fullerton historical landmark criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style with Churrigueresque elements. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district’s period of significance (1935–1942).
- **Mid-Century Modern Campus Expansion Historic District.** The buildings designed by William Henry Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect Taylor.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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- **Music Building 1100.** This building appears eligible as both a district contributor (of the Mid-Century Modern Campus Expansion Historic District) and an individual property under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, 7, 8, and 9, for its high artistic value associated with the New Formalism style and for its location prominently anchoring the southwest corner of campus.
- **Wilshire Junior High School Historic District.** The original 1936 Wilshire Junior High School campus buildings appear to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3 and City of Fullerton historical landmark criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose best-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke's School in San Francisco.

These findings indicate that Fullerton College contains numerous buildings that are considered historical resources under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided.

No archaeological resources were identified within the project site as a result of the records search or Native American coordination. However, it is always possible that intact archaeological deposits are present at subsurface levels. For these reasons, the project site should be treated as potentially sensitive for archaeological resources. Management recommendations to reduce potential impacts to unanticipated archaeological resources and human remains during campus construction activities are provided.

# **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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## **1 INTRODUCTION**

Dudek was retained by the North Orange County Community College District (District) to conduct a cultural resources study for the proposed Fullerton College Facilities Master Plan (proposed project) Program Environmental Impact Report (EIR). The cultural resources study includes the following components: (1) a California Historical Resources Information System (CHRIS) records search covering the proposed project site plus a 0.5-mile radius, (2) a review of the California Native American Heritage Commission's (NAHC's) Sacred Lands File, (3) outreach with local Native American tribes/groups identified by the NAHC to collect any information they may have concerning cultural resources, (4) a pedestrian survey of the project site for cultural resources, (5) archival and building development research for buildings located within the project site, (6) the evaluation of buildings for California Register of Historical Resources (CRHR) eligibility, and (7) consideration of impacts to historical resources in compliance with the California Environmental Quality Act (CEQA).

This report was prepared by Dudek Architectural Historians Sarah Corder, MFA, Samantha Murray, MA, and Kara Dotter, MSHP, all of whom exceed the Secretary of the Interior's Professional Qualification Standards for architectural history (see resumes provided in Appendix C).

### **1.1 Project Location**

Fullerton College is located at 321 East Chapman Avenue in the City of Fullerton (City) and occupies an approximately 70-acre site in northern Orange County (Figure 1). The project site is discontiguous and includes the entire Fullerton College Campus north of Chapman Avenue between Lemon Street to the west and Berkeley Avenue to the east; the Wilshire Center School of Continuing Education to the south (located on the northeast corner of Lemon Street and Wilshire Avenue); and residential properties located south of Chapman Avenue, including 416, 418, 420, 428, 434, and 438 East Chapman Avenue, and 325–327 and 409 North Newell Place (Figure 2).

### **1.2 Project Description**

#### **1.2.1 Introduction**

The District is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings and to construct new facilities to improve the safety and educational experience of those attending Cypress College, Fullerton College, Anaheim Campus, and the School of Continuing Education in accordance with Measure J. In 2014, voters passed a \$574 million Measure J Facilities/Bond Program. The Measure J Bond Program will help make upgrades to lecture halls, technology, and instructional equipment to better prepare

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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students for growing fields of study and high-skill careers for all District campuses. It also allows the District to enhance classroom space and training centers. It will allow the District to expand veterans' services, as well as job placement centers to train and retrain veterans as they transition into the civilian workforce (District 2016a).

Fullerton College is proposing to implement the proposed project to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond while constructing and renovating facilities to meet the District's instructional needs. Improved circulation in and around campus would increase accessibility to existing and new development and enhance the overall connectivity of campus uses.

### **1.2.2 Facilities Master Plan Elements**

#### **1.2.2.1 New Construction**

Based on the information in the *Proposed Facilities Master Plan Updates* (District 2016b), the projects in the following text have detailed information available and would receive project-level assessment. See Figure 3 for existing campus land uses and Figure 4 for proposed campus land uses. All construction projects would be funded by Measure J, with the exception of the Aquatics Center expansion.

#### **Welcome Center**

The proposed Welcome Center would be northeast of the East Chapman Avenue and North Lemon Street intersection to make it accessible and visible to students, visitors, and the community. The Welcome Center would be three stories tall and 29,470 assignable square feet (ASF; 44,000 gross square feet (GSF)) and would include a Veterans Resource Center and space for student services.

#### **New Instructional Building**

This building would be between the Classroom office 1400 and Physical Education 1200. The new instructional building would be three stories tall and 47,900 ASF (72,400 GSF) and would include classrooms, faculty offices, and support spaces.

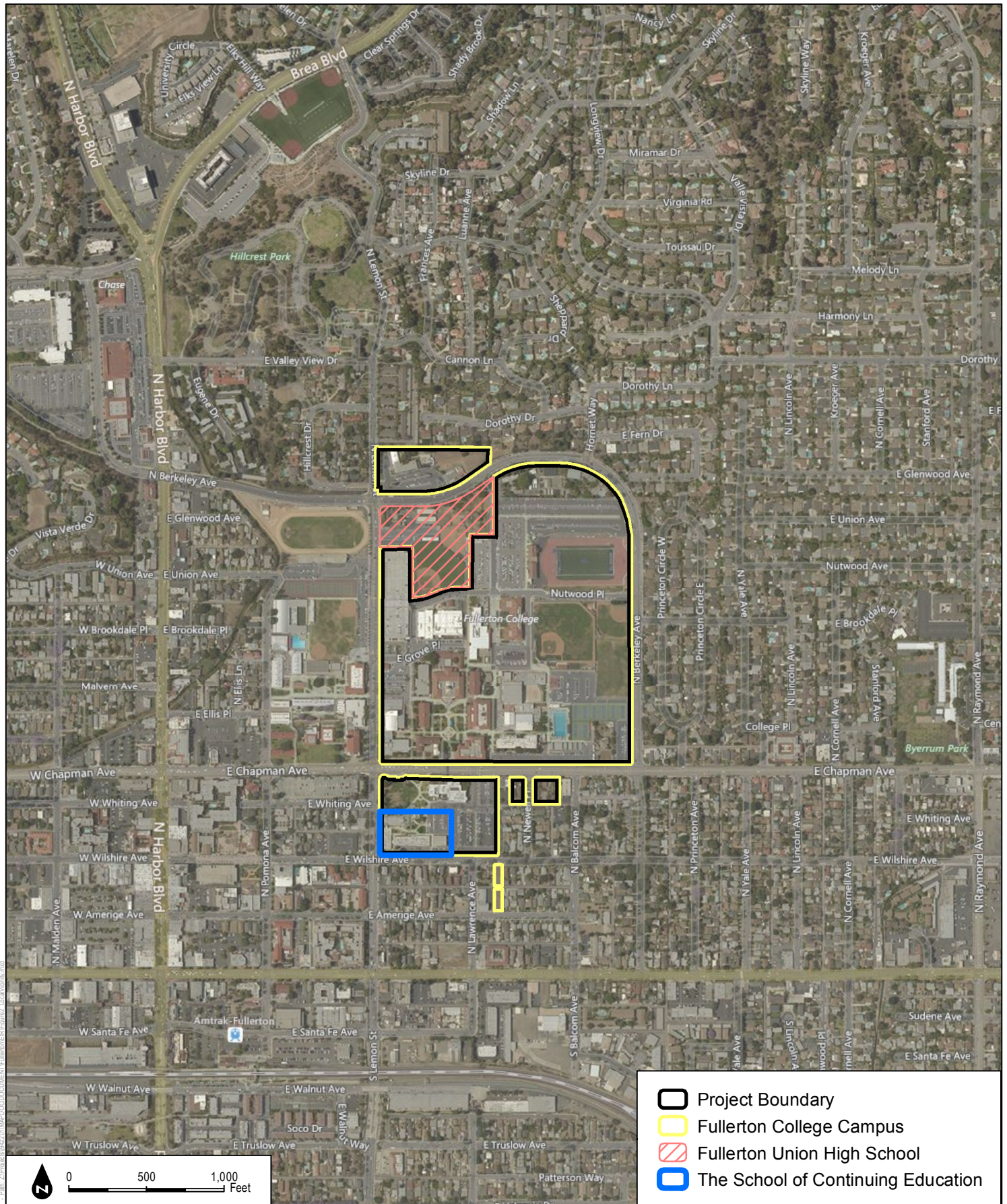


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Fullerton College Facilities Master Plan Program EIR**

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SOURCE: Bing Maps, 2016

**DUDEK**

Fullerton College Facilities Master Plan Program Environmental Impact Report

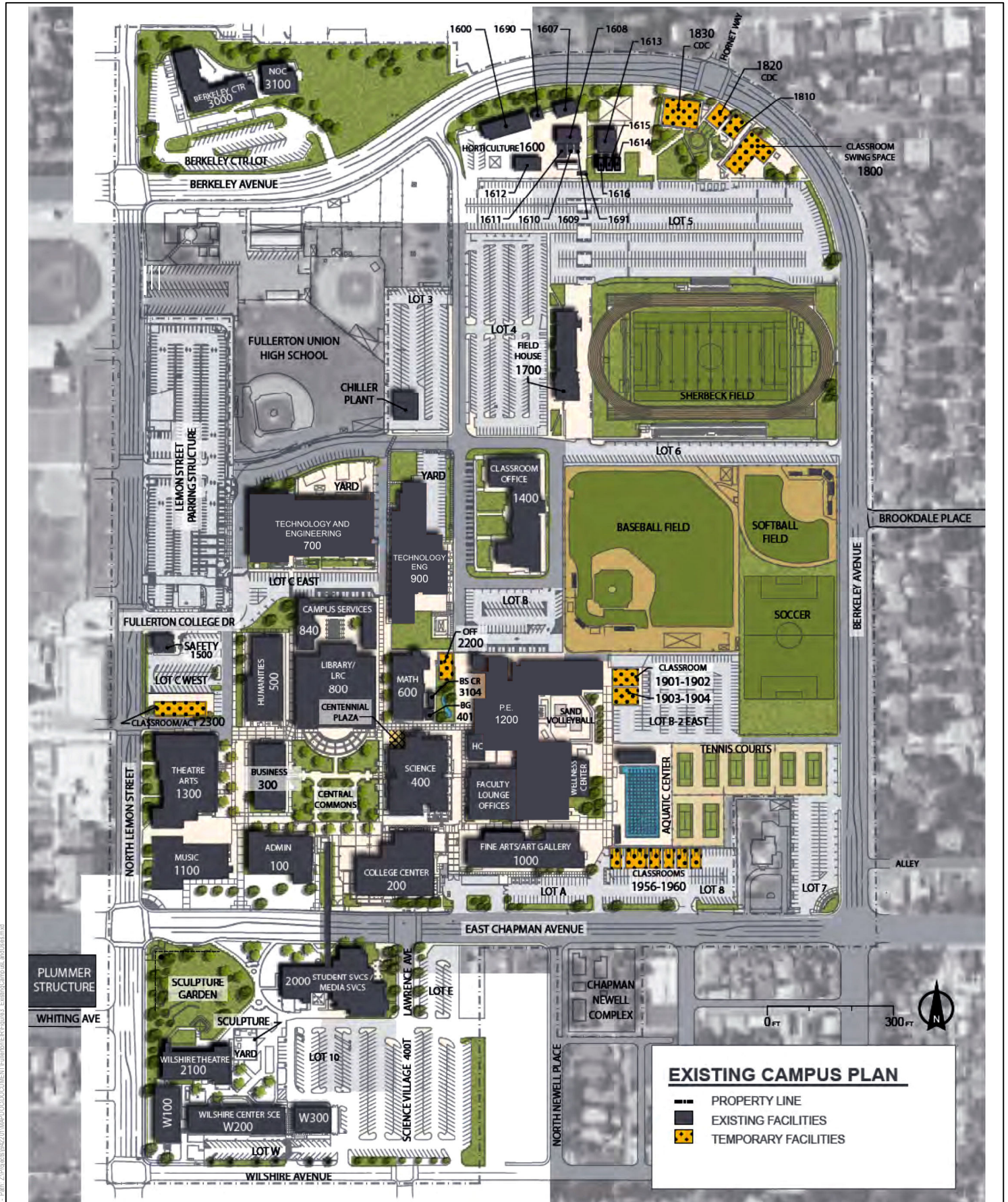
**FIGURE 2**  
Local Vicinity Map



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SOURCE: HMC Architects, 2014

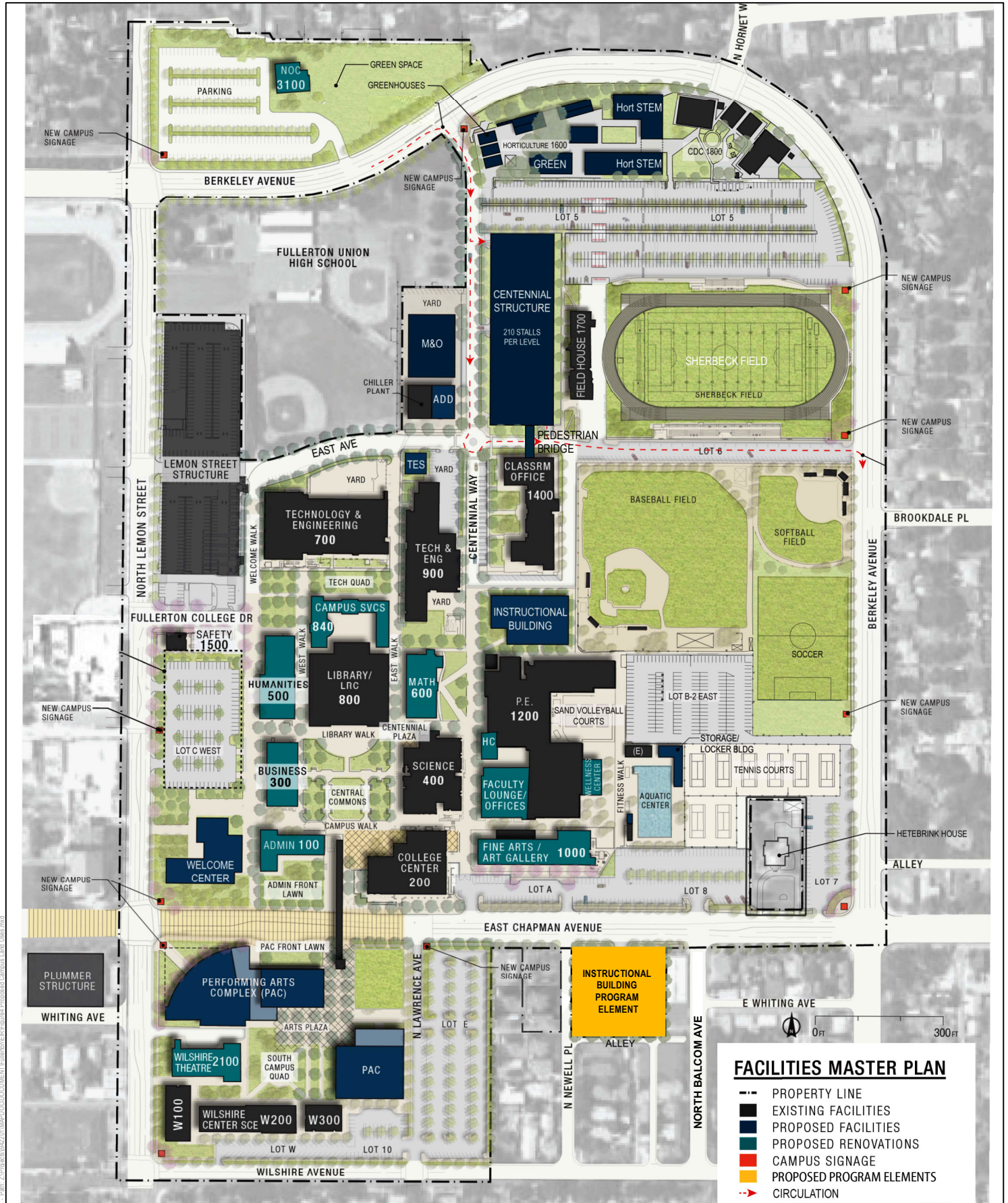
**FIGURE 3**  
Existing Campus Land Uses

**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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SOURCE: HMC Architects, 2011

**FIGURE 4**  
Proposed Campus Land Uses

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## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Horticulture and Vocational Services Center**

The Horticulture and Vocational Services Center would be in the northeastern portion of the campus (where the existing Horticulture buildings are currently located). New greenhouses would be constructed along with an instructional facility that will include lecture space and lab space for the Biotechnical program and kitchen facilities for the Food/Nutrition program. The new facilities would total 26,900ASF (32,300 GSF), and each facility would be one story in height.

The Lab School facility would replace the existing 1810, 1820, and 1830 buildings, located in the northeastern corner of campus, east of the Horticulture 1600 buildings. The Lab School would provide classroom and support space for the Child Development program. The building would be one story tall and 6,271 ASF (7,427 GSF).

### **Centennial Parking Structure**

The proposed project would consist of a new four-level parking structure planned west of Sherbeck Field. The parking structure would provide 840 parking spaces and would be 300 ASF (260,000 GSF). A digital display would be located at the entrance of the parking structure, which would show the number of parking spaces available or if the parking structure is full. Ingress and egress from the structure is described more fully under “Realignment of Campus Access to the Centennial Parking Structure.”

### **Pedestrian Bridge**

A new pedestrian bridge would span 60 feet across East Avenue and would connect to the second floor of the parking structure and Building 1400.

### **Realignment of Campus Access to the Centennial Parking Structure**

The proposed project would also involve the realignment of the primary one-way access from Berkeley Avenue (north) to the proposed structure and then from the structure to Berkeley Avenue (east). This would also involve the construction of a new south driveway to the new Centennial parking structure and a roundabout at the intersection of East Avenue and Centennial Way. The new realignment would limit vehicle entry from the eastern side of the parking structure and vehicle exit south of the parking structure, which would limit one-way traffic along East Avenue and Centennial Way.

### **New Parking Lots**

New parking lots are proposed throughout the campus. The Berkeley Center lot, located north of Berkeley Avenue, will be introduced upon demolition of the Berkeley 3000 building. Lot C West, located south of the Lemon Street Structure and the Safety 1500 building, will be significantly

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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expanded after the demolition of the Theatre Arts 1300 building. Lot 11 will be introduced after the removal of 428, 434, and 438 East Chapman Avenue and 400 North Newell Place.

### **New Maintenance and Operations Facility, Chiller Plant Addition, and Thermal Energy Storage**

The new Maintenance and Operations facility would be located west of the Centennial Parking Structure and north of the chiller plant. The Maintenance and Operations facility would be two stories tall and 13,200 ASF (22,300 GSF). The Maintenance and Operations facility would provide administration offices, trade work areas, and support functions.

The chiller plant addition would be one story tall and 1,600 square feet and would be required to accommodate additional facilities as part of the proposed project. The chiller plant addition would include a circulation pump, condenser water pump, and a cooling tower and would require the addition of underground piping to the thermal energy storage tank.

The thermal energy storage tank would be located south of the chiller plant. A one-story-tall, 3,900-square-foot building would encase the tank.

### **Aquatics Center**

Improvements to the Aquatics Center, located east of the Physical Education Building 1200, would include deck storage, a small shower/locker room, and two classrooms added to the north of the existing pool. These facilities would total 1,800 ASF (3,500 GSF) and would be one story tall.

### **New Performing Arts Complex**

The Performing Arts Complex is a replacement building complex that would define the south campus quad, and includes renovation of the historic Wilshire Theatre. The Performing Arts Complex auditorium would include an 80-foot-tall fly loft and total 25,658 ASF (40,300 GSF). The Performing Arts Complex would serve to replace the Theatre Arts 1300, the Music building 1100, and the TV/Radio program currently held in Building 2000. The Performing Arts Complex would host theatre and music events. The Theatre Arts 1300 and the Music Building 1100 currently offer 150 and 694 seats, respectively. Therefore, the new Performing Arts Complex would offer 844 seats. The Performing Arts Complex could also be used by other schools and entities. The Performing Arts Complex would also include support space, laboratories, and classrooms in a separate two-story building.

### **Chapman–Newell Instructional Building**

The new instructional building would be two stories tall and 35,200 ASF (54,600 GSF) and would include classrooms, faculty offices, and support spaces.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.2.2.2 Renovation**

Based on the information in the *Proposed Facilities Master Plan Updates* (District 2016b), the projects in the following text have detailed information available and would receive project-level assessment. See Figure 3 for existing campus land uses and Figure 4 for proposed campus land uses. All renovation projects would be funded in part or in totality by Measure J. Renovation of the Business 300 and Humanities 500 buildings will be funded in part by Measure J and also through state funding. State funding is also being considered for renovation of the Math 600 building and the Performing Arts Complex.

Due to the age and condition of the existing buildings, the Facilities Master Plan emphasizes renovation and modernization of existing facilities. The goals of the proposed renovations are to maximize educational space and improve efficiency/utilization of existing facilities. Building renovations could include new energy-efficient lighting, ceilings, flooring, casework, elevators, ADA access, ADA-compliant restrooms, stairwells, and heating, ventilation, and air conditioning systems. Figure 4 shows which facilities are planned for renovation.

#### **Math Building 600**

Math Building 600 is located in the center of the campus, south of the Technology and Engineering Building 900. Upon renovation, the building would continue to provide classrooms and the Mathematics and Computer Science Division office.

Renovations to the Math Building 600 would primarily consist of interior finishes, including installation of a new HVAC system and electrical modifications. Fenestrations would also be incorporated into the exterior walls to allow for better air intake. The bathrooms would be remodeled to meet ADA standards. Additionally, the handrails located in the exterior stairwells would need to be replaced to meet ADA standards. Other ADA renovations would be required to allow access for the visually impaired.

The Math Lab and support spaces, which have been vacated, would be converted to classrooms and offices. A new hallway would be added to provide appropriate exiting from the building. Technology upgrades would be required to meet the needs of faculty and students. Reconfiguration of the interior space would be required to create a Math Skills Center with computer stations, whiteboards, work tables, and study rooms. Renovations would also be required to grant students easier access to faculty offices and to create space for students and faculty to meet.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Physical Education Building 1200 – Wellness Center, Faculty Offices, and Health Center**

Physical Education Building 1200 is located in the center of campus, north of the Fine Arts Gallery Building 1000. The Wellness Center, faculty offices, and Health Center are located in the eastern wing, southwestern wing, and western wing, respectively, of Physical Education Building 1200. Upon renovation of the Wellness Center and the Health Center, the buildings would continue to provide space for clinical and psychological services for Fullerton College students. The faculty offices would continue to provide office space for faculty members.

The Wellness Center and Health Center could require relocation to the new Welcome Center, and the remaining areas of the facilities would require interior renovations. Renovations would include the reconfiguration of space to support program needs; upgrade of technology infrastructure; upgrade of building systems, such as mechanical, electrical, plumbing, and structural; increase of restroom capacity to meet current codes; and upgrade of access throughout the building to meet current ADA compliance.

### **Wilshire Theatre Building 2100**

Wilshire Theatre Building 2100 is located in the southwestern corner of campus, south of East Chapman Avenue and north of Wilshire Avenue. Wilshire Theatre Building 2100 would require renovation to serve as a 400-seat concert hall. Renovations would include improved lighting, updated electrical systems, structural reinforcements to support new rigging, and improved backstage support areas. Currently, the second story is not wheelchair accessible. Upon renovation, all areas of the theater would be universally accessible. Remodeled restrooms, theater access, and stage access redesign would also be required to comply with ADA standards. The theater would also require redesign to provide a designated box office.

### **Business Building 300**

Business Building 300 is located in the southwestern portion of campus, south of the Humanities Building 500. Upon renovation, the building would continue to provide classrooms and study space to support the Business program and the Business and Computer Information Systems Division office. Renovations would include a reorganization and modernization of instructional space; remodel and reuse of vacant spaces; upgrades to provide modern instructional technology infrastructure; an increase in restroom capacity to comply with current codes; reconstruction of existing stairs and construction of new stairs and ramps to comply with current codes; replacement of mechanical, electrical, plumbing, telecommunication, and structural systems; retrofits to achieve an exceedance of Title 24 energy requirements by 15%; and hazardous materials abatement.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Specifically, the interior and exterior of the eastern and western entrances would need to be remodeled and ramps would need to be installed to meet ADA requirements. Openings would also be incorporated into the exterior walls to allow for better air intake. New louvers would be installed throughout the exterior of the building.

### **Humanities Building 500**

Humanities Building 500 is located in the southwestern portion of campus, west of the Library/Learning Resources Center Building 800. Upon renovation, the building would provide classrooms and study space to support the Humanities program, the Humanities Division office, and could support the Veterans Resource Center. Renovations would include a reorganization and modernization of instructional space; remodel and reuse of vacant spaces; updates to provide modern instructional technology infrastructure; an increase in restroom capacity to comply with current codes; reconstruction and construction of new stairs and ramps to comply with current codes; replacement of mechanical, electrical, plumbing, telecommunication, and structural systems; retrofits to achieve an exceedance of Title 25 energy requirements by 15%; and hazardous materials abatement.

A board-formed finish would be applied to the exterior of the building, and tiles would be installed on the roof to appear consistent with the 1930s-era buildings on campus.

These renovations would provide current technology hardware and software and hybrid and flexible classroom and lab space. Additionally, the Veterans Resource Center could require renovations to accommodate the anticipated increase in veteran students. The Assessment Center requires a lab to support 50 students for testing purposes.

### **Campus Services Building 840**

Campus Services Building 840 is located in the western portion of campus, north of Library–Learning Resources Center Building 800. Upon renovation, the Campus Services Building 840 would continue to provide Disability Support Services for students, the mailroom, and a café. Renovations would include the reprogramming of vacant space and the addition of a testing space for students. Doorway modifications would be required to ensure ADA compliance.

### **Administration Building 100**

Administration Building 100 is located in the southwestern portion of campus, south of the Business Building 300. The student services functions currently located in Administration Building 100 would be relocated in the new Welcome Center. Administration Building 100 would be reprogrammed and reconfigured to support Fullerton College’s administrative functions.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Renovation would include the demolition of the 1957 addition and restoration of the original entrance tower that was built in the 1930s. The Financial Aid Office would be reconfigured to create queuing space for students; space to accommodate staff in private work locations; a private office for the Director of Financial Aid attached or adjacent to the Financial Aid Office; space for intake, including a lowered counter space to accommodate students with mobility impairments; confidential space for intake; and a secured file room to comply with federal record-keeping requirements.

Renovations to the entrance and basement would be required to correct access issues.

### **Fine Arts Gallery Building 1000**

Fine Arts Gallery Building 1000 is located in the southern portion of campus, south of Physical Education Building 1200. The building would continue to provide gallery space and classrooms for the Fine Arts program upon renovation. Renovations would include the installation of new glass doors, illuminated signage, parking, security, and improved construction and preparation space. The existing infrastructure would require replacement. A redesign of classrooms would be required for technology upgrades and to maximize space. Redesign of the studio art labs would also be required to provide space for new art methods, materials, and technology.

A board-formed finish would be applied throughout the exterior of the building. The existing elevator does not meet current code and would require replacement. Existing handrails in the stairways would also require replacement.

### **Academic Computing Building 3100**

Academic Computing Building 3100 is located in the northernmost portion of the campus, north of Berkeley Avenue. The building would continue to provide academic computing laboratories for students. Renovations would include upgrading technology infrastructure; upgrading building systems, such as mechanical, electrical, plumbing, and structural; increasing restroom capacity to meet current codes; and upgrading access throughout the building to meet current ADA compliance.

#### **1.2.2.3 Demolition**

The following facilities would be removed as part of implementation of the proposed project and would be assessed at the project level. Figure 5 shows which facilities are planned for demolition or removal.



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### **Berkeley Center Building 3000**

The existing Berkeley Center Building 3000, constructed in 1960, is located in the northernmost portion of campus, north of Berkeley Avenue. Berkeley Center Building 3000 currently provides space for maintenance and operations, an Assessment Center, and additional facilities space. Removal of this building would provide additional parking for students in the north campus. The services housed in the existing Berkeley Center Building 3000 would be moved to a more central location on campus.

Berkeley Center Building 3000 is a Modern-style, two-story educational building that is L-shape in plan designed by the late master architect William Henry Taylor (1912–1995). The front (northwest) elevation has an uneven roofline and extends out from the rest of the building with broad expanses of brick cladding and windows set flush into the stucco cladding between the brick. There is a separate entrance recessed into the brick wall with a metal door atop a set of concrete steps. The rest of the building is clad in stucco. The rear of the building contains a patio area with concrete walkways, ornamental lawn, and brick planters.

### **Horticulture Building 1600 Complex**

The Horticulture Building 1600 Complex is located in the northeastern corner of campus. The existing buildings range from 17 to 78 years old and currently support the Horticulture program. To accommodate growth in the Horticulture program, the existing buildings would be replaced with more state-of-the-art buildings and outdoor space. The existing buildings are at the end of their useful life.

### **Theatre Arts Building 1300**

Theatre Arts Building 1300 is located in the southwestern portion of the campus. The existing building was built in 1966. To accommodate growth in the Theatre Arts program, the existing building would be replaced with a more updated Performance Arts Complex, which would provide classroom space and accommodate multiple campus programs.

### **Music Building 1100**

Music Building 1100 is located in the southwestern corner of campus, north of East Chapman Avenue. This building was originally constructed in 1966. The intent is to replace Music Building 1100 with a more updated Performance Arts Complex, which would provide classroom space and accommodate multiple campus programs.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Student Services Building 2000**

Student Services Building 2000 is located south of East Chapman Avenue. The original building was constructed in 1984 and would be replaced with a new Welcome Center.

### **Media Services/Academic Computing/Maintenance and Operation Shops Building 2300**

Media Services/Academic Computing/Maintenance and Operation Shops Building 2300 is located on the western edge of campus, north of Theatre Arts Building 1300. This temporary building would be replaced with a new Maintenance and Operations facility and new permanent instructional buildings.

### **Classrooms 1955–1960**

These temporary classrooms are located on the eastern portion of campus, in Lot 8. These temporary buildings would be replaced with new permanent instructional buildings.

### **Classrooms 1901–1904**

These temporary classrooms are located on the eastern portion of campus, in Lot B-2 East. These temporary buildings would be replaced with new permanent instructional buildings.

### **Office Building 2200**

This temporary office building is located in the center of campus, east of Math Building 600. This temporary office building would be replaced with a new Welcome Center, which would provide permanent office space.

### **Child Development Center Building 1800 Complex**

These temporary classrooms are located in the northeastern corner of campus, east of the Horticulture Building 1600 Complex. These temporary classrooms would be replaced with new permanent one-story instructional buildings.

### **428, 434, and 438 East Chapman Avenue and 400 North Newell Place**

These properties are located south of Chapman Avenue and east of North Newell Place and are currently developed with four single-family residences. These properties are currently vacant and would be removed and replaced with an instructional building.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.2.2.4 Site Improvement Elements**

Various site improvement elements include new signage at campus entryways, clear and safe vehicular drop-offs, and creation of more pedestrian pathways.

#### **Parking/Vehicular Entry Improvements**

Primary vehicular circulation is on public streets that surround the campus (Berkeley Avenue, East Chapman Avenue, and North Lemon Street). There is a need to improve circulation and connections on campus between the campus north of Berkeley Avenue and south of East Chapman Avenue, as well as within the main campus. Vehicular drop-off points need to be clearly identified. The campus is not open to bicycles or skateboards.

#### **Pedestrian Circulation**

Fullerton College is primarily a pedestrian-oriented campus, but there is a need for more pathways for pedestrians, particularly for students who park in the north and then walk across parking lots to access instructional buildings in the south of campus.

#### **Infrastructure Improvements**

New buildings would require sewer, water, storm, gas, telecom, and electrical utilities. The upgrades from the thermal energy storage tank will tie in to the existing utility infrastructure, which would accommodate and support these planned upgrades and modifications. New utility lines would connect to the existing infrastructure.

The existing ventilation and air conditioning infrastructure would be modified to connect all chilled and condensing water to the existing central plant and the thermal energy storage tank. An expansion of the existing chiller plant would also occur to serve these new facilities.

Future energy upgrades as part of the Fullerton College Energy Plan would include new lighting upgrades to interior and exterior facilities, HVAC system upgrades, installation of an automatic weather-sensing irrigation system, and installation of chiller water temperature reset controls (Fullerton College 2017). These upgrades are part of ongoing energy improvements, and are separate activities from the proposed project.

## **1.3 Regulatory Setting**

This section includes a discussion of the applicable national, state, and local laws, ordinances, regulations, and standards governing cultural resources, which must be adhered to before and during construction of the proposed project.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.3.1 Federal**

Although there is no federal nexus for this project, National Register of Historic Places (NRHP) criteria was addressed in consideration of previous evaluations that identified the Fullerton College Campus as potentially eligible for the NRHP (see Section 2.1.2, Previously Recorded Cultural Resources).

The NRHP is the United States' official list of districts, sites, buildings, structures, and objects worthy of preservation. Overseen by the National Park Service under the U.S. Department of the Interior, the NRHP was authorized under the National Historic Preservation Act, as amended. Its listings encompass all National Historic Landmarks and historic areas administered by the National Park Service.

NRHP guidelines for the evaluation of historic significance were developed to be flexible and to recognize the accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the NRHP. For a property to be listed in or determined eligible for listing in the NRHP, the property must be demonstrated to possess integrity and to meet at least one of the following criteria:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history (NRB 2002, p. 2).

Integrity is the ability of a property to convey its significance. To be listed in the NRHP, a property must not only be shown to be significant under the NRHP criteria, but it also must have integrity. The evaluation of integrity is sometimes a subjective judgment, but it must always be

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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grounded in an understanding of a property's physical features and how they relate to its significance. Historic properties either retain integrity (this is, convey their significance) or they do not. To retain historic integrity a property will always possess several, and usually most, of the seven aspects described above. The retention of specific aspects of integrity is paramount for a property to convey its significance (NPS 1990).

### **1.3.2 State**

#### **California Register of Historical Resources**

In California, the term “historical resource” includes, but is not limited to, “any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California” (California Public Resources Code (PRC), Section 5020.1(j)). In 1992, the California legislature established the CRHR “to be used by state and local agencies, private groups, and citizens to identify the state’s historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change” (PRC Section 5024.1(a)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

- (1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
- (2) Is associated with the lives of persons important in our past.
- (3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- (4) Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1(c)(1–4)).

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

### **California Environmental Quality Act**

As described further, the following CEQA statutes (PRC Section 21000 et seq.) and CEQA Guidelines (14 CCR 15000 et seq.) are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- PRC Section 21083.2(g) defines “unique archaeological resource.”
- PRC Section 21084.1 and 14 CCR 15064.5(a) defines “historical resources.” In addition, 14 CCR 15064.5(b) defines the phrase “substantial adverse change in the significance of an historical resource”; it also defines the circumstances when a project would materially impair the significance of a historical resource.
- PRC Section 21074(a) defines “tribal cultural resources.”
- PRC Section 5097.98 and 14 CCR 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- PRC Sections 21083.2(b) and 21083.2(c) and 14 CCR 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures. Preservation in place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause “a substantial adverse change in the significance of an historical resource” (PRC Section 21084.1; 14 CCR 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1(q)), it is a “historical resource” and is presumed to be historically or culturally significant for purposes of CEQA (PRC Section 21084.1; 14 CCR 15064.5(a)). The lead agency is not precluded from determining that a

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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resource is a historical resource even if it does not fall within this presumption (PRC Section 21084.1; 14 CCR 15064.5(a)).

A “substantial adverse change in the significance of an historical resource” reflecting a significant effect under CEQA means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (14 CCR 15064.5(b)(1); PRC Section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project:

- (1) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
- (2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- (3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA (14 CCR 15064.5(b)(2)).

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any “historical resources,” then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource’s historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC Sections 21083.2(a), (b), and (c)).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC Section 21083.2(g)).

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (PRC Section 21083.2(a); 14 CCR 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as a tribal cultural resource (PRC Section 21074(c), 21083.2(h)), further consideration of significant impacts is required.

Section 15064.5 of the CEQA Guidelines assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in PRC Section 5097.98.

### **California Health and Safety Code Section 7050.5**

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (California Health and Safety Code, Section 7050.5(b)). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (California Health and Safety Code, Section 7050.5(c)). The NAHC will notify the “most likely descendant.” With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the most likely descendant by the NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **1.3.3 Local**

#### **The Fullerton Plan**

The Built Environment and Revitalization sections of *The Fullerton Plan*, the City's General Plan (City of Fullerton 2012a), briefly discuss goals and policies associated with preservation of the built environment. The following are excerpted portions pertinent to the Fullerton College Facilities Master Plan.

**Goal 4** Value and preserve historic resources.

#### **Policy 4.2: Awareness of Historic Resources**

Support programs and policies to raise the awareness of the value of historic resources in strengthening communities, conserving resources, fostering economic development, and enriching lives.

#### **Policy 4.3: Historic Resources Maintenance and Enhancement**

Support projects, programs, policies, and regulations to promote the maintenance, restoration, and rehabilitation of historical resources.

#### **Policy 4.4: Historic Character and Sense of Place**

Support projects, programs, policies, and regulations to reinforce the character and sense of place of established neighborhoods and districts by protecting and preserving those elements in both the private and public realms which contribute to the historic character through the use of tools including, but not limited to, preservation overlay zones and landmark districts.

#### **Policy 4.5: Historic Building Preservation**

Support projects, programs, policies, and regulations to encourage the protection and preservation of individual historic structures throughout the City, but with particular attention to the preservation of noteworthy architecture in the downtown.

#### **Policy 4.7: Responsiveness to Historic Context**

Support projects, programs, policies, and regulations to design new buildings that respect the integrity of nearby historic buildings while clearly differentiating the new from the historic.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Policy 4.9: Historic Building Retrofits**

Support projects, programs, policies, and regulations to encourage the retrofit of historic buildings in ways that preserve their architectural design character, consistent with life safety considerations, maintaining the unique visual image of Fullerton.

**Goal 11** Revitalization activities that result in community benefits and enhance the quality of life in neighborhoods, districts, and corridors.

### **Policy 11.3: Preservation-Based Revitalization**

Support policies, projects, and programs concerning historic preservation to protect Fullerton's heritage, revitalize neighborhoods, generate design and construction jobs, and bolster the community's sense of place.

### **City of Fullerton Municipal Code**

Although the City of Fullerton has no jurisdiction over the proposed project, the college is located within the City of Fullerton. Therefore, local designation criteria are applicable to significance evaluations on campus. In the City of Fullerton Municipal Code, a "Significant Property" is defined as an individual building, structure, or feature that is considered a historical or cultural resource in the City and that is eligible for "Historical Landmark" designation. A list of Significant Properties is contained in the Resource Management Element of The Fullerton Plan.

#### ***15.48.060. Criteria for Designation***

- A. In considering a request for a "Historical Landmark" designation, the following criteria shall be used in determining eligibility:
1. Character, interest or value as part of the heritage of the city.
  2. Location as a site of a historic event.
  3. Identification with a person or persons or groups who significantly contributed to the culture and development of the city.
  4. Exemplification of a particular architectural style or way of life important to the city.
  5. Exemplification of the best remaining architectural types in an area.
  6. Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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7. Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.
  8. Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.
  9. A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.
  10. Integrity as a natural environment that strongly contributes to the well being of the people of the city.
- B. In considering a request for a “Landmark District” designation, support of the designation should be demonstrated by a substantial majority of the property owners within the boundary of the proposed district (City of Fullerton Municipal Code, Ordinance 2982, 2001).



**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

## 2 BACKGROUND RESEARCH

### 2.1 CHRIS Records Search

On December 14, 2016, Dudek archaeologist Adriane Dorrlor conducted a search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC), located on the campus of California State University, Fullerton. The search included any previously recorded cultural resources and investigations within a 0.5-mile radius of the project site. The CHRIS search also included a review of the NRHP, the CRHR, the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Historic Resources Inventory list. The records search results maps and bibliography of previous studies are provided in Confidential Appendix A.

#### 2.1.1 Previously Conducted Cultural Resources Studies

A total of seven cultural resources studies were previously conducted within a 0.5-mile radius of the project site (Table 1). Of these, one study (OR-03509) overlaps the current project site. An additional seven studies were conducted within the La Habra and Anaheim quadrangles that may include portions of the proposed project site. However, these studies are not mapped due to insufficient locational data. Confidential Appendix A provides a complete bibliography from the SCCIC, including the unmapped studies not included in Table 1.

**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

SCCIC Report No.	Title of Study	Author(s) and Date	Proximity to Project Site
OR-00559	Archaeological Survey of T.t. No. 9730, City of Fullerton, County of Orange, California	Cottrell, Marie G., 1977	Overview Study
OR-01114	An Archaeological Assessment for the Florence Crittenton Services of Orange County Fullerton, California	Cameron, Constance, 1991	Outside
OR-02101	An Archaeological Survey of Redevelopment Property in the City of Fullerton for the Orange County Transit District	Cameron, Constance, 1979	Outside
OR-02512	Cultural Resource Assessment, AT&T Wireless Services Facility No. 13054a, Orange County, California	Duke, Curt and Judith Marvin, 2002	Outside
OR-02564	Archaeological Assessment for Paseo Park, City of Fullerton, California	Demcak, Carol R., 2002	Outside
OR-02763	Proposed Verizon Wireless Facility: Commonwealth (9990225) in the City of Fullerton, Orange County, California	Maki, Mary K., 2001	Outside

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

SCCIC Report No.	Title of Study	Author(s) and Date	Proximity to Project Site
OR-2766	Cultural Resources Records Search and Literature Review Report for a Verizon Wireless Telecommunications Facility: Cell Site Commonwealth (99900225) in the City of Fullerton, Orange County, California	Mason, Roger D., 2001	Outside
OR-02768	Archaeological Survey and Record Search for Opsc-0038, La/Fullerton, Fullerton, Orange County (800-42)	Holson, John, 2002	Outside
OR-02811	Cultural Resource Assessment at AT&T Wireless Services Facility No. 13055a Orange County, California	Duke, Curt, 2002	Outside
OR-02831	Records Search for Crosswalk Lighting Project, Commonwealth Ave. at Yale Ave., City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02832	Records Search for Crosswalk Lighting Project, Raymond Ave. at Wilshire Ave., City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02839	Records Search for Crosswalk Lighting Project, Harbor Boulevard at Ellis Place, City of Fullerton	Allen, Kathleen C., 2003	Outside
OR-02895	Cultural Resources Records Search and Site Visit Results for Nextel Communications Candidate Ca8762a 147 East Amerige Avenue, Fullerton, Orange County, California	Bonner, Wayne H., 2005	Outside
OR-03298	(see LA7871) Historical Resource Evaluation Report Third Main Track and Grade Separation Project Hobart (mp 148.9) to Basta (mp 163.3), BNSF/Metrolink East-West Main Line Railroad Track, Vernon to Fullerton, Los Angeles and Orange Counties, California	Tang, Bai "Tom" and Teresa Woodward, 2003	Outside
<b>OR-03509</b>	<b>Cultural Resources Survey, Fullerton College, North Orange County Community College District</b>	<b>Secord, Paul R., 2003</b>	<b>Within</b>
OR-03825	A Cultural Resources Inventory of Planning Area 9B and 9C, Irvine, California	Drover, Christopher, 2000	Outside
OR-03921	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA03022-A (Fullerton Hand Car Wash), 812 North Harbor Boulevard, Fullerton, Orange County, California	Bonner, Wayne, 2010	Outside
OR-04012	Records Search for Bechtel Corporation Site LSANCA3028 (Elks Club C.O.W.)	Wlodarski, Robert, 2008	Outside
OR-04045	American Recovery and Reinvestment Act (ARRA) Funded Security Enhancement Project (PRJ29112364) – Station Hardening CCTV Surveillance System Upgrades, and Airborne Particle Detection at Fullerton Station, Fullerton, Orange County, California	Speed, Lawrence, 2009	Outside
OR-04086	Archaeological and Paleontological Resources Monitoring Compliance Report for the Fullerton transit Project, City of Fullerton, Orange County, California	Glover, Amy and Gust, Sherri, 2011	Outside

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 1**  
**Previously Conducted Cultural Resources Studies within 0.5 Miles of the Project Site**

SCCIC Report No.	Title of Study	Author(s) and Date	Proximity to Project Site
OR-04467	Cultural Resources Records Search Results for T-Mobile West, LLC Candidate LA02531A (CM531 AT&T Office) 143 Amerige Avenue, Fullerton, Orange County, California	Bonner, Diane, Wills, Carrie and Crawford, Kathleen, 2014	Outside
OR-04467A	Direct APE Historic Architectural Assessment for T-Mobile West, LLC Candidate LA02531A (CM531 AT&T Office) 143 Amerige Avenue, Fullerton, Orange County, California	Bonner, Wayne H. and Kathleen A. Crawford, 2014	Outside

**Notes:**

SCCIC = South Central Coastal Information Center.

Items shown in **bold** are on the project site.

## **OR-03509**

In August 2003, Paul Secord of UltraSystems Environmental Incorporated prepared the *Cultural Resources Survey, Fullerton College, North Orange County Community College District*. The study was prepared as part of an EIR for the Fullerton College Master Development Plan. A total of seven buildings were recommended as eligible for the CRHR and NRHP: Fullerton College Student Union Building 800, Fullerton College Industrial Building, Fullerton College Commerce Building 300, Fullerton College Administration Building 100, Wilshire Theatre Building 2100 (School Auditorium), Wilshire School Building 1A (Elementary School), and Wilshire School Building 2A (Elementary School).

## **GPA 2015**

One additional study within the proposed project site that was not identified by the CHRIS records search is a 2015 study conducted by GPA Consulting (GPA) entitled *428, 434, and 438 East Chapman Avenue, Fullerton, California, Historical Resource Evaluation Report*. This report presents the results of a historical resource evaluation of three properties using NRHP, CRHR, and Fullerton Historical Landmark criteria. The study concluded that none of the properties appear eligible for listing in any of the three registration programs due to a lack of historical significance.

### **2.1.2 Previously Recorded Cultural Resources**

Forty-two cultural resources were previously recorded within 0.5 miles of the project site (Table 2). Two of these resources overlap the proposed project site: Fullerton Junior College (FJC) (30-157212) and Wilshire Junior High School (30-157290). Both of these resource evaluations were

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

updated as part of the current study. There is one archaeological resource recorded within 0.5 miles of the project site (30-001712). Of the 41 structures and buildings recorded within 0.5 miles of the project site, 13 are listed in the NRHP (30-157210, -157213, -157218, -157226, -157232, -157247, -157253, -157254, -157261, -157278, -157289, -157299, and -157300), 8 are listed as City of Fullerton Local Landmarks (30-157210, -157211, -157213, -157253, -157254, -157261, -157289 and -157290), 1 is listed as a City of Fullerton Potential Local Landmark and is recognized as a City of Fullerton Significant Property (30-157212), 1 was found to be a contributing property to a district eligible for local listing (30-156665), and 2 were determined not eligible through Section 106 consultation (30-161896 and -162503).

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-001712	Historic: Fullerton Transit Historical Refuse deposit (CA-ORA-1712H)	Mort, J., 2010	Unknown	Outside
30-001724	Union Pacific Park	Gold, A., 2013	Unknown	Outside
30-156665	Historic: 1321 Frances Ave. (place where Hawaiian Punch formula was invented)	Jones, T., 2007	5D2	Outside
30-157210	Historic: Plummer (Louis) Auditorium, 201 East Chapman Ave.	Miller, E., 1979	1S (HL-10)	Outside
30-157211	Historic: Fullerton Union High School, 201 East Chapman Ave.	Miller, E., 1979	7N; (HL-78, -79, -81)	Outside (adjacent to southwest)
<b>30-157212</b>	<b>Historic: Fullerton Junior College, 321 East Chapman Ave.</b>	<b>Miller, E., 1979</b>	<b>7N; Potential Local Landmark (recognized as significant property)</b>	<b>Within</b>
30-157213	Historic: Hetebrink (John) House, 515 East Chapman Ave.	Miller and Woodward, 1978	1S; (HL-40)	Outside
30-157218	Historic: Commercial Building, Amerige (George) Block (Addresses include: 109, 111, 113, 115, 117, 119, 121, 123 East Commonwealth Ave.)	Miller, E., 1979	1S	Outside
30-157226	Historic: Old Fellows Hall, 114 East Commonwealth Ave.	Miller, E., 1979	1S	Outside
30-157227	Historic: Commercial Building, 118 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157228	Historic: Pacific Electric Railway Depot, 128 East Commonwealth Ave.	Stone, M., 1978	2S	Outside
30-157229	Historic: Residence, Davies (Richard Thomas) House, 145 East Commonwealth Ave.	Stone, M., 1978	7N	Outside

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-157230	Historic: Fullerton Post Office, 202 East Commonwealth Ave.	Miller, E., 1979	Unknown	Outside
30-157232	Historic: Fullerton City Hall, 237 West Commonwealth Ave.	Richey, D., 2002	1S	Outside
30-157234	Historic: Loumagne's Market, 329 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157235	Historic: Grumwald's (Gus) Tin Shop, 341 East Commonwealth Ave.	Miller, E., 1979	5S2	Outside
30-157237	Historic: Multi-family Residence, 520 East Commonwealth Ave.	Williman, L., 1979	5S2	Outside
30-157238	Historic: Residence, 524 East Commonwealth Ave.	Williman, L., 1979	5S2	Outside
30-157247	Historic: Farmers and Merchants Bank of Fullerton, 122 North Harbor Blvd.	Marsh, D., 1993	1S	Outside
30-157248	Historic: Masonic Temple, 201-203 North Harbor Blvd.	Stone, M., 1978	7N	Outside
30-157252	Historic: Peninsula Oil Burner Company, 425-427 South Harbor Blvd.	Miller, E., 1979	5S2	Outside
30-157253	Historic: Fox Fullerton Theatre Complex, 500-512 North Harbor Blvd.	Richey, D., 2006	1S (HL-35)	Outside
30-157254	Historic: Masonic Temple, 501 North Harbor Blvd.	National Park Service, 1995	1S (HL-43)	Outside
30-157261	Historic: Hillcrest Park, 200 Brea Blvd.	Richey, D., 2003	1S (HL-6)	Outside
30-157270	Historic: Residence, 117 South Pomona Ave.	Bryant, W., 1979	7N	Outside
30-157278	Historic: Santa Fe Railway Passenger and Freight Depot	Stone, M., 1978	1S, 3S, 2S3, 2S, 2S2	Outside
30-157280	Historic: Commercial Building, 125 West Santa Fe Ave.	Miller, E., 1979	5S2	Outside
30-157281	Historic: Sanitary Laundry, 225 West Santa Fe Ave.	Miller, E., 1979	5S2	Outside
30-157284	Historic: Union Pacific Passenger and Freight Depot	Stone, M., 1978	3S	Outside
30-157289	Historic: Dewella Apartments, 234 East Wilshire Ave.	National Park Service, 2009	1S (HL-70)	Outside
<b>30-157290</b>	<b>Historic: Wilshire Junior High School, 315 East Wilshire Ave.</b>	<b>William, L. 1979</b>	<b>7N (HL-12)</b>	<b>Within</b>
30-157299	Historic: Fullerton Union Pacific Depot, 100 East Santa Fe Ave.	Loomis, J., 1982	1S	Outside
30-157300	Historic: Chapman Building, 110 East Wilshire Ave.	Galvin, T., 1982	1S	Outside

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 2**  
**Previously Recorded Cultural Resources within 0.5 Miles of the Project Site**

Primary Number	Resource Description	Recorded By/Year	NRHP/CRHR Eligibility Status	Proximity to Project Site
30-161896	Historic: Residence at 412 S. Pomona Ave.	Morad, L., 1991	6Y	Outside
30-162503	Historic: 134 West Truslow Ave.	SHPO, 1995	6Y	Outside
30-176663 / 19-186804	Historic: Burlington Northern Santa Fe Railway	McCormick, S. 2007; Tang, B. 2002	6Z	Outside
30-176766	Historic: Fullerton First Methodist Episcopal Church, 117 N. Pomona Ave.	Richey, D., 2000	Unknown	Outside
30-176951	Historic: Residence, 615 E. Commonwealth Ave.	Jacquemain, T., 2009	5D2	Outside
30-177471	Historic: Fender's Radio Service, 1-7 S. Harbor Blvd.	National Park Service, 2013	1S	Outside
30-177510	Historic: Pacific Telephone and Telegraph Company, 143 East Amerige Ave.	Gallegos and Taniguchi, 2005	6Y	Outside
30-179864	Historic: Residence, 408 E. Truslow Ave.	SHPO, 2003	Unknown	Outside

**Notes:**

1S: Individual property listed in the NRHP by the Keeper. Listed in the CRHR.

2S: Individual property determined eligible for NRHP by the Keeper. Listed in the CRHR.

2S2: Individual property determined eligible for NRHP by a consensus through Section 106 process. Listed in the CRHR.

2S3: Individual property determined eligible for NRHP by Part 1 Tax Certification. Listed in the CRHR.

3S: Appears eligible for NRHP as an individual property through survey evaluation.

5D2: Contributor to a district that is eligible for local listing or designation.

5S2: Individual property that is eligible for local listing or designation.

6Y: Determined ineligible for the NRHP by consensus through Section 106 process. Not evaluated for CRHR or local listing.

6Z: Found ineligible for NRHP, CRHR, or local designation through survey evaluation.

7N: Needs to be reevaluated (formerly NRHP status code 4).

HL: City of Fullerton Local Landmark.

Resources shown in **bold** are on the project site.

### **30-157212**

A Historic Resources Inventory form was completed for FJC by Emily Miller in March of 1979. The form identified four of the buildings on the FJC Campus that were constructed with Works Progress Administration (WPA) funding throughout the 1930s by architect Harry Vaughn.

### **30-157290**

A Historic Resources Inventory form was completed for the Wilshire Junior High School by Lex Williman in March of 1979. The survey identified three buildings that were constructed with WPA funding in the 1930s by an unknown architect.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **428, 434, and 438 East Chapman Avenue**

As previously discussed, these previously recorded and evaluated resources were not identified by the CHRIS records search but fall within the proposed project site. In 2015, GPA evaluated all three properties using NRHP, CRHR, and Fullerton Historical Landmark criteria. The study concluded that none of the properties appear eligible for listing in any of the three registration programs due to a lack of historical significance.

## **2.2 Native American Coordination**

As part of the process of identifying cultural resources within or near the project site, Dudek contacted the NAHC to request a review of the Sacred Lands File. The NAHC emailed a response on January 19, 2017, which stated that the Sacred Lands File search was completed with negative results. Because the Sacred Lands File search does not include an exhaustive list of Native American cultural resources, the NAHC suggested contacting Native American individuals and/or tribal organizations who may have direct knowledge of cultural resources in or near the project site. The NAHC provided the contact list along with the Sacred Lands File search results. Documents related to the NAHC Sacred Lands File search are included in Appendix B.

Dudek prepared and sent letters to each of the nine persons and entities on the contact list requesting information about cultural sites and resources in or near the project site. These letters, mailed on February 16, 2017, contained a brief description of the proposed project, a summary of the Sacred Lands File and SCCIC search results and survey results, and a reference map. Recipients were asked to reply within 15 days of receipt of the letter should they have any knowledge of cultural resources in the area.

Dudek has received one response to the coordination letters to date (Appendix B). On February 24, 2017, Andrew Salas, Chairman of the Gabrieleño Band of Mission Indians – Kizh Nation responded via email. Mr. Salas stated that the proposed project site is in an area where the ancestral territories of Kizh Gabrieleño villages overlapped during the Late Prehistoric and Protohistoric periods. For this reason, Mr. Salas considers the project site to be highly sensitive for cultural resources and recommends the presence of both a Native American monitor and an archaeological monitor on site during all ground-disturbing activities.

The proposed project is subject to compliance with Assembly Bill 52 (PRC 21074), which requires consideration of impacts to “tribal cultural resources” as part of the CEQA process, and requires the CEQA lead agency to notify any groups (who have requested notification) of the proposed project who are traditionally or culturally affiliated with the geographic area of the



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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project. Because Assembly Bill 52 is a government-to-government process, all records of correspondence related to Assembly Bill 52 notification and any subsequent consultation are on file with the District. At the time this report was written, the District indicated they had not received any AB 52 consultation requests on the proposed project at Fullerton College.

### **2.3 Building Development Research**

On February 24, 2017, Dudek contacted Oscar Saghie, Project Manager of Campus Capital Projects, to inquire about access to Fullerton College Campus building as-built drawings and schematics, and to obtain copies of any available reports and historic reference documents on file with Fullerton College or the District. Mr. Saghie arranged for access to the District's electronic collection of campus as-built drawings and schematics, which date from 1933 to 2013.

Dudek also reviewed a set of documents and photographs available online through the Fullerton College Library called *Fullerton College: A Pictorial History*, which includes a collection of historic photographs of the campus with content largely written by Debora Richey et al. in 2012.

Other sources of information regarding the history and development of the campus included the following:

- *Los Angeles Times* (1923–current), accessed via ProQuest Historical Newspapers
- *Los Angeles Times*, accessed via Newspapers.com
- *San Diego Union*, accessed via Genealogybank.com
- *San Francisco Chronicle*, accessed in person at Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton News Tribune*, accessed in person at Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton City Directories*, accessed in person at the Fullerton Public Library Local History Room on March 16, 2017
- *Archival and historical files*, accessed in person at the Fullerton Public Library Local History Room on March 16, 2017
- *Fullerton Through the Years: A Survey of Architectural, Cultural & Environmental Heritage*, accessed through the City of Fullerton's website at [www.cityoffullerton.com](http://www.cityoffullerton.com)
- Historical aerial photograph research from the years 1952, 1953, 1954, 1963, 1972, 1994, 2002, 2003, 2004, 2005, 2009, 2010, and 2012 (NETROnline 2017)
- 1927–1949 Sanborn Fire Insurance Company maps (Sanborn).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3 HISTORIC CONTEXT**

Post-contact history for the State of California is generally divided into three periods: the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican–American War, signals the beginning of the American period, when California became a territory of the United States.

#### **Spanish Period (1769–1822)**

Spanish explorers made sailing expeditions along the coast of Southern California between the mid-1500s and mid-1700s. In search of the legendary Northwest Passage, Juan Rodríguez Cabrillo stopped in 1542 at present-day San Diego Bay. With his crew, Cabrillo explored the shorelines of present-day Santa Catalina Island, as well as San Pedro and Santa Monica Bays. Much of the present-day California and Oregon coastline was mapped and recorded in the next half-century by Spanish naval officer Sebastián Vizcaíno. Vizcaíno’s crew also landed on Santa Catalina Island and at San Pedro and Santa Monica Bays, giving each location its long-standing name. The Spanish crown laid claim to California based on the surveys conducted by Cabrillo and Vizcaíno (Bancroft 1885; Gumprecht 1999).

More than 200 years passed before Spain began the colonization and inland exploration of Alta California. The 1769 overland expedition by Captain Gaspar de Portolá marks the beginning of California’s Historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, while Portolá was exploring Southern California, Franciscan Friar Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823.

The Portolá expedition first reached the present-day boundaries of Los Angeles in August 1769, thereby becoming the first Europeans to visit the area. Father Crespi named “the campsite by the river Nuestra Señora la Reina de los Angeles de la Porciúncula” or “Our Lady the Queen of the Angeles of the Porciúncula.” Two years later, Friar Junípero Serra returned to the valley to establish a Catholic mission, the Mission San Gabriel Arcángel, on September 8, 1771 (Kyle 2002).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Mexican Period (1822–1848)**

A major emphasis during the Spanish period in California was the construction of missions and associated presidios to convert the Native American population to Christianity and integrated communal enterprise. Incentives were also provided to bring settlers to pueblos or towns, but just three pueblos were established during the Spanish period, only two of which were successful and grew into California cities (San José and Los Angeles). Several factors kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the indigenous population. After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Dallas 1955).

Extensive land grants were established in the interior during the Mexican period, in part to increase the population inland from the more settled coastal areas where the Spanish first concentrated their colonization efforts. Nine ranchos were granted between 1837 and 1846 in the future Orange County area (Middlebrook 2005). Among the first ranchos deeded within the future Orange County were Manuel Nieto's Rancho Las Bolsas (partially in the future Los Angeles County), granted by Spanish Governor Pedro Fages in 1784, and the Rancho Santiago de Santa Ana, granted by Governor José Joaquín Arrillaga to José Antonio Yorba and Juan Pablo Peralta in 1810. The secularization of the missions following Mexico's independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos.

During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary Southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of non-native inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

### **American Period (1848–Present)**

War in 1846 between Mexico and the United States precipitated the Battle of Chino, a clash between resident *Californios* and Americans in the San Bernardino area. The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American period.

California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as U.S. Territories (Waugh 2003). Horticulture and

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the Southern California economy through 1850s. The Gold Rush began in 1848 and, with the influx of people seeking gold, cattle were no longer desired mainly for their hides but also as a source of meat and other goods. During the cattle boom of the 1850s, rancho *vaqueros* drove large herds from Southern to Northern California to feed that region's burgeoning mining and commercial boom. The cattle boom ended for Southern California as neighboring states and territories began driving herds to Northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 1941).

### **3.1 City of Fullerton Historical Overview**

#### **Residential Development**

The architectural development of the City of Fullerton, as for a lot of cities, was shaped by the demographics of the City. Unlike high-style architectural movements seen in other cities, Fullerton represents a middle- and working-class development pattern starting prior to the City's founding in 1887. Prior to 1887, the development within Fullerton was largely pioneer settlements without significant architectural presences. It was not until the early 1900s that residential and commercial development really took off in Fullerton. Another interesting feature of the development in Fullerton is the concept of moving buildings from their original locations. The following discussion on residential development is largely based on information from *Fullerton Through the Years: A Survey of Architectural, Cultural & Environmental Heritage*, prepared for the Development Services Department (DSD) in 2002.

The period of Fullerton's architectural history beginning in 1900 represents a departure from the early founding patterns and a move to modern city development. Fullerton was largely an agricultural community until oil was discovered in 1890. The resulting oil boom in Fullerton continued into the 1920s, making a great deal of the residential and commercial developments of the early twentieth century possible (Morris et al. 2004). Although there are a few surviving pre-1900 buildings, most of the visible architectural development in the City is post-1900. Most of the buildings built prior to the turn of the century were largely vernacular and lacked the sophistication and key elements for classification as high style. Even though recognizable architectural styles appeared in Fullerton after the turn of the century, Fullerton was primarily a working- and middle-class city. This is reflected in buildings from the period, which lack many of the high-style elements seen in the truest forms of the early twentieth century styles.

Like other cities throughout the United States, Fullerton saw a boom era in the 1920s that laid the groundwork for the City's residential architectural foundation. The boom was seen in both residential and commercial building types and can largely be attributed to the oil boom. In 1920, Fullerton established an unofficial policy stating that Spanish Colonial Revival should be the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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style used when designing commercial and civic buildings, a policy that was largely followed by the business and civic leaders of the City until the 1950s.

One of the most prevalent architectural styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. In the City of Fullerton, California bungalows were popular and prevalent from 1915 to 1925 (DSD 2002; McAlester 2015).

Although the California Bungalow's popularity seemed unlikely, with its heavy use of wood in an area like Southern California where termite populations were high, it flourished. One of the key characteristics of the California Bungalow is the simplistic beauty and small footprint, which made it ideal for small families living on a middle-class budget. The key features of the style include one- to two-story designs, overhanging eaves, distinct horizontal lines, low pitched roof designs, wood shingle detailing, large front porches either centered or offset, paired windows, Craftsman style doors, interior built-in cabinets, recessed entryways, stone or brick fireplaces, and battered wooden porch supports (DSD 2002; McAlester 2015).

The California Bungalow was also taken a step further in cities like Fullerton, being used to create a Bungalow Court. A Bungalow Court is a collection of bungalows placed around a shared garden space to create a U shape. The intention of the Bungalow Court was to create a multi-family dwelling concept that provided greenspace for families or individuals who could not afford a single-family residence on their own private lot. Fullerton Bungalow Courts were placed near the downtown area within easy walking distance of urban amenities. Like standard Bungalow Courts, Fullerton Bungalow Courts typically provided six to ten units in a U shape, with a larger bungalow to the rear of the property forming the base of the U shape (DSD 2002).

In addition to California Bungalows, the Cottage/Storybook style also had some popularity in Fullerton during the 1920s. According to Fullerton Heritage, a local builder named E.S. Gregory built a tract of cottages on the north side of East Whiting Avenue and later the City built a model Cottage as a way to promote home buying in the City. The Cottage movement in Fullerton was short-lived and was not seen past 1935 in Fullerton, but there are still numerous examples remaining in the City today (DSD 2002).

The City of Fullerton experienced its last big housing boom following World War II (WWII) as veterans and young families were looking for places to call home. Throughout the 1940s and 1950s, the building permit valuations saw an incredible increase from \$2.5 million in 1948 to \$114 million by 1956 (DSD 2002; Morris et al. 2004).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2 Fullerton College Historical Overview**

The following historical context is largely drawn from the Fullerton College Library's *Fullerton College: A Pictorial History* (Richey et al. 2012).

#### **3.2.1 Fullerton College Beginnings**

Educational development in the City of Fullerton quickly followed the City's founding in 1887. Although high schools and grammar schools were the frontrunners in educational development, the City residents and leaders quickly realized that they needed an educated workforce for their growing city. In 1907 California became the first state with legislation that allowed for the establishments of junior colleges. The City of Fullerton quickly adapted the legislation and by April of 1913 established a junior college program stemming from the Fullerton Union High School. According to Fullerton College Library's *Fullerton College: A Pictorial History*, FJC first opened in September of 1913 with the following:

...enrollment of twenty-eight male and female students who registered for twelve classes, including English, Art, History, Logic, Psychology, Mathematics, Physics, Chemistry, German, Mechanical Drawing, and Manual Training (Richey et al. 2012).

On April 10, 1933, the California Field Act was passed to allow state input, inspection, and approval on school building plans. The Field Act was established as a reactionary legislative act to the Long Beach Earthquake of 1933 and the resulting damage and destruction caused to schools throughout Southern California. The 6.4 magnitude earthquake proved many schools unsafe and constructed without safeguards to protect against earthquake damage. Moving forward, all school building renovations and constructions had to be compliant with Field Act legislation to avoid a repeat of the events of the Long Beach Earthquake. In 1949, Donald Beach Kirby, president of the American Institute of Architects (AIA) in San Francisco, stated that all schools since 1933 met the requirements laid out by the Field Act of 1933 (SDU 1949; Alquist 2007).

In 1933, the Board of Trustees purchased 16 acres of land one block east of Fullerton Union High School. The acquisition of this parcel of land was the first official step taken by the board to separate the high school from the new FJC Campus. The Board of Trustees hired architect Harry K. Vaughn (1882–1962) to replace Carleton M. Winslow (Vaughn's mentor) as campus architect. Winslow was hired by the District in 1919 and designed all major buildings on the adjacent Fullerton Union High School campus. Prior to arriving in Fullerton, Vaughn had worked closely with Winslow on the extremely influential Panama-California International Exposition in San Diego (1915-1917) and followed Winslow back to Los Angeles to work on the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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high school project. While working with Winslow on the high school campus, Vaughn oversaw the finalization of drawings as well as construction of the buildings.

For its new FJC Campus, the college put Vaughn in charge of the design, planning, and development of the FJC Campus from 1935 to 1942. Vaughn brought a great deal of experience and expertise to the FJC Campus design. Prior to becoming the FJC Campus architect, Vaughn had studied and worked under accomplished California architects Irving Gill, William Sterling Hebbard, and Octavius Morgan. However, his most relevant experience was gained during his time working on Fullerton Union High School buildings with Winslow (Richey 2010).

### **3.2.2 The Great Depression and World War II**

Although the Great Depression financially devastated most of the country, the development of the FJC Campus continued.

Vaughn operated as the FJC Campus architect with the assistance of WPA funds, designing and supervising construction of numerous buildings on the campus until 1942. The costs for building construction under Vaughn were as follows:

Commerce Building (\$148,777), the Social Science and Administration Building (\$163,633), the Technical Trades Building (\$224,321), the Locker Room and Student Center (\$60,454), and the Shop Building (\$76,605). Vaughn also designed the walls for the sunken garden and additional landscaping features (\$47,793) (Richey et al. 2012).

While architectural development continued during the Depression, enrollment also increased. With 4-year university enrollments on the decline due to financial instability, FJC provided an affordable option for the students of Fullerton and the surrounding communities, eventually reaching an enrollment of 1,500 by September 1939. However, FJC was not immune to the effects of WWII and experienced a rapid decline in enrollment after 1939, as many potential students were drafted or volunteered for the military. FJC persevered through the war, implementing new programs to support the war effort by training workers for defense industry jobs. FJC had the Adult Education Department staff working 6 days a week in multiple shifts to keep the school doors open from 7:00 a.m. to midnight, 6 days per week. Other activities on the FJC Campus further supported the war effort, such as letter writing and making clothing for the troops (LAT 1935; Richey et al. 2012).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2.3 Postwar Expansion on Campus**

As the war was ending in 1944, the Servicemen Readjustment Act, also known as the G.I. Bill of Rights, was signed into law by President Franklin D. Roosevelt. The act afforded servicemen and women the opportunity to receive an education without having to worry about the high costs of tuition, and provided a monthly stipend for living expenses. The act also covered the costs of schoolbooks and other necessary supplies. These government incentives resulted in approximately 1.7 million veterans enrolling in colleges by 1947, accounting for nearly 49% of college admissions under the G.I. Bill. Of the 16 million WWII veterans in the United States, 7.8 million participated in higher education programs because of the G.I. Bill.

Although FJC did its best to anticipate the educational needs of WWII veterans, they were ultimately unprepared for the rush of student veterans. In the school year 1944–1945, only 15 veterans were enrolled at FJC. By 1946–1947, after the G.I. Bill had officially been signed into law, that number jumped drastically to 843 students. Not only did FJC have the largest freshman class in its history, but men outnumbered women by more than two to one. FJC found itself in dire need of funding to accommodate the demands of the veteran student population. The veteran population also had a different set of needs than that of the typical college student. Many of the veterans had not yet graduated high school and had to complete special courses at Fullerton Union High School. In addition, the veterans were often older; many were already married with young children at home. Some were in need of special psychological, vocational, and other types of counseling.

Housing was ultimately the biggest problem on the FJC Campus. The City of Fullerton had already experienced a drought in the housing market during the 1920s and 1930s, and the problem only worsened after the war when veterans returned home to settle down and start families, discovering that there was no housing available. To help remedy the problem, the FJC established a Veterans Home in 1946, the only school-sponsored housing for G.I. students in Southern California. The Veterans Home served as a dormitory for up to 40 single veterans and was located at the end of Las Palmas Drive in Sunny Hills. Because many veterans were married with small children, the Board of Trustees purchased a 4.1-acre property for \$10,126 in 1946 from City librarian Carrie Sheppard and her mother Dixie Carolyn to house married veterans and their families. The property was located adjacent to the northern boundary of the FJC Campus with a 276-foot frontage along North Harvard Avenue (now Lemon Street). With the support of the Federal Public Housing Authority, FJC was able to set up 25 temporary dwellings. Eventually 51 dwelling units were constructed, providing homes for 125 married veterans and their families on the FJC Campus.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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This was a tremendous accomplishment for FJC and an example of great cooperation among agencies; FJC was the first educational institution in California to apply for and be granted veteran student housing. The federal government provided the housing, the state government paid for all associated utilities, and FJC donated the land to build the property. The G.I. housing at 1000 North Harvard Avenue would eventually name itself “College View,” and would remain in place just north of the FJC Campus until around 1956. Although originally constructed for veterans of WWII, the onset of the Korean War provided a good reason to keep the housing in place for years to follow. By 1956, 381 Korean War veterans were enrolled at FJC, many of whom lived in College View (LAT 1954a).

With a growing post-war population, residents of the City of Fullerton approved tax increases and bond measures in support of the development of new schools and the expansion of existing campuses. FJC hired Pasadena architectural firm Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) to design a new master plan for the campus. This led to a number of new building projects on the FJC Campus, all under the architectural design of William H. Taylor, including a new Science building, Gymnasium, Library, Student Center, Technical Education building, Art–Home Economics building, and District Administration Center.

In 1965, FJC Superintendent Ernest G. Lake replaced architects Taylor and Conner with William E. Blurock and Associates. In addition to designing new buildings, Blurock’s firm made additions to the existing Library and Science buildings. Hoping that the addition of new buildings would finally be adequate to accommodate its student population, the District parted with the temporary classrooms it had obtained from the federal government at the end of WWII. By 1968, the District was forced to lease portable classrooms after underestimating its growing student body. By the time FJC reached its 50th anniversary in 1963, its regular daytime student enrollment had risen to 9,000; approximately 560 courses were being offered; and the FJC Campus had grown to over 57 acres, with 17 buildings valued between \$12 and \$15 million. In 1965, enrollment saw an unexpected sharp rise in the number of male students, who were hoping to avoid being drafted into the military. Other changes happening in 1965 were the split of Fullerton Union High School and FJC (LAT 1965a, 1965b, 1967a).

In 1965, FJC received the green light for expansion plans that would shape the campus’s future with the northern perimeter construction endeavor with the City of Fullerton. The plans would create a new road that would extend from Berkley Avenue, cross Lemon Street, and continue west toward Harbor Boulevard. The 1965 agreement between the City and the District laid the groundwork for FJC’s expansion in 1967 that included the purchase of lots along Chapman Avenue and Lemon Street. The parcels and buildings located at 816 North Lemon Street, 816½ North Lemon Street, 820 North Lemon Street, and 319 Chapman Avenue were successfully purchased by FJC and the buildings were demolished in preparation for the construction of the Music and Theatre buildings (LAT 1965c; Richey et al. 2012).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.2.4 Politics and Social Change**

In the 1960s and into the 1970s, FJC students were growing increasingly more political against the backdrop of McCarthyism and the growing anti-communist movement. FJC experienced its own political drama with the release of an “unapproved student publication” titled *The Black Flag: A Journal of Opinions*, which was declared “subversive” (Richey et al. 2012). The District Administration Center was subsequently crammed with over 200 angry parents and local community activists, who demanded that the literary journal be banned from FJC. These types of demands continued throughout the decade, along with new demands to close certain courses, fire specific District employees or faculty members, and allow students to attend anti-communist courses off campus during regular class time. In 1961, a popular FJC welding instructor named Wendell B. Phillips Jr. was dismissed, for reasons cited as his membership in the Communist Party and refusing to discuss the political activities of his fellow faculty members (Mudrick et al. 2015).

Faculty members continued to feel shut out from all policy-making decisions on campus and found themselves with almost no opportunity to speak honestly or partake in any organization with a minority viewpoint for fear it would elicit controversy. In the 1960s, the District officially merged with other nearby college districts to form the North Orange County Junior College District, later changed to the North Orange County Community College District (District) (Richey et al. 2012).

### **3.2.5 Economic Uncertainty**

In June 1971, the District Board of Trustees approved the new Master Plan for FJC, which called for the rehabilitation of three buildings—the Business Education, North Science, and Art–Home Economics buildings—as well as construction of new facilities, including a multi-use stadium/outdoor amphitheater. Unfortunately, a lackluster economy prevented new building projects from being approved to move forward. Although existing buildings were eventually refurbished, FJC focused on smaller projects such as new lighting in the parking lots, new tennis courts, expansion of the Print Shop, new air-conditioning units for several buildings, updated athletic facilities, and the addition of a new Reading Center, Women’s Center, Veterans Affairs Office, Service for the Disabled Center, Student Affairs Office, Office of Community Services, and Artist-in-Residence Program. In August 1972, the Board of Trustees voted to officially change the name of Fullerton Junior College (FJC) to Fullerton College.

In the latter part of the 1970s, Fullerton College, along with the most of the United States, continued to experience challenging economic conditions. On the heels of the Vietnam War, the country entered a recession, causing a decline in the Fullerton College student population. The Arab oil embargo of 1973–1974 caused a sharp rise in gasoline prices, and the passage of Proposition 13 in 1978 resulted in massive cutbacks and layoffs throughout Fullerton College.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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A 19% cutback in the state budget resulted in over 200 classes being canceled, a reduction in the number of satellite campuses, and dissolution of over 100 positions. The school library was subjected to a 73% budget cut, leaving little funding for new books. In response to the economic crisis, the District implemented student fees for health services and parking. The school's agricultural program was also completely phased out in 1972, and physical education was no longer a required course (Richey et al. 2012).

### **3.2.6 Diversity and Expansion**

Against the backdrop of the budget crisis, Fullerton College students began to question the underrepresentation of minorities in the curriculum. Fullerton College responded by offering an Ethnic Studies Program that included courses such as Black History, Chicano History, and History of Native Americans. Meanwhile, women were beginning to question the offering of courses such as Personal Charm I and II, Grooming and Poise, and Figure Control, and demanded courses that reflected the reality of women entering the workforce in record numbers. In 1973, Fullerton College offered a course called College and Career Opportunities for Women, followed by additional classes in Women's Studies. Fullerton College also began offering classes for the disabled, as well as never-before-seen workshops that reflected a new reality on campus, such as rape prevention, drug and alcohol abuse control, and venereal disease education workshops.

In the 1980s, the Fullerton College Campus was once again feeling pressed for space. Although no new classrooms were added, Fullerton College did make some additions and modifications for new facilities. In 1982, the photography and journalism laboratories were added to the 500 Building, outdated exterior lighting was replaced, old payphones were replaced, and a new telecommunications system linking all 25 buildings was installed. In compliance with Section 504 of the Rehabilitation Act of 1973, Fullerton College made numerous modifications to accommodate wheelchair access. In 1980, Fullerton College purchased the Chapman–Wilshire Schools, which included unused land in the northeastern portion of the property. Fullerton College opted to construct a new Student Services Center on this portion of land. Other new construction on campus included the Child Care building and a greenhouse located at the Horticulture Complex (Richey et al. 2012).

## **3.3 Campus Development and Expansion**

### **3.3.1 Original Campus Master Plan (1935–1942)**

Campus development at FJC was intertwined with the Fullerton Union High School buildings for many years in its early history, but in 1935 Vaughn ushered in a new era for FJC with his campus plan on the newly acquired 16 acres of land. Vaughn was assisted by landscape architect

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Ralph D. Cornell in his plan and would receive a great deal of WPA and Public Works Administration (PWA) funding for executing the campus plan (Richey 2010):

Having already supervised the construction of all the buildings on the high school campus while working for Carleton Winslow, Vaughn was eminently qualified for his new assignment as college campus architect. Using Public Works Administration (PWA), then Work Projects Administration (WPA) funds, Vaughn designed, then supervised, the construction of all of the new campus buildings... Vaughn also designed the walls for the sunken garden and additional landscaping features (\$47,793), which the WPA funded. Forty-five percent of the building costs were paid by the federal government, with the remainder supplied by the school district.

Typical of the time, Vaughn chose Spanish Colonial Revival as the architectural style for the early campus buildings, and the layout was greatly influenced by Thomas Jefferson's plan for the University of Virginia. As shown in Figure 6, Vaughn oriented the buildings facing a large central greenspace with shared services buildings, like the library and student services, in the center. The WPA also provided Vaughn and FJC with the funding for the construction of a greenhouse and for landscaping. With this funding, the Horticulture students of FJC were able to grow plants to place throughout the campus, accenting Vaughn's plan (see Figure 7 for an aerial view of the FJC Campus in 1940). Although 12 buildings were planned and designed by Vaughn, only the Commerce building, Administration building, Technical Trades building, Student Union building, and Greenhouse building were constructed and still stand today (Richey 2010; Epting 2014; LAT 1935).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

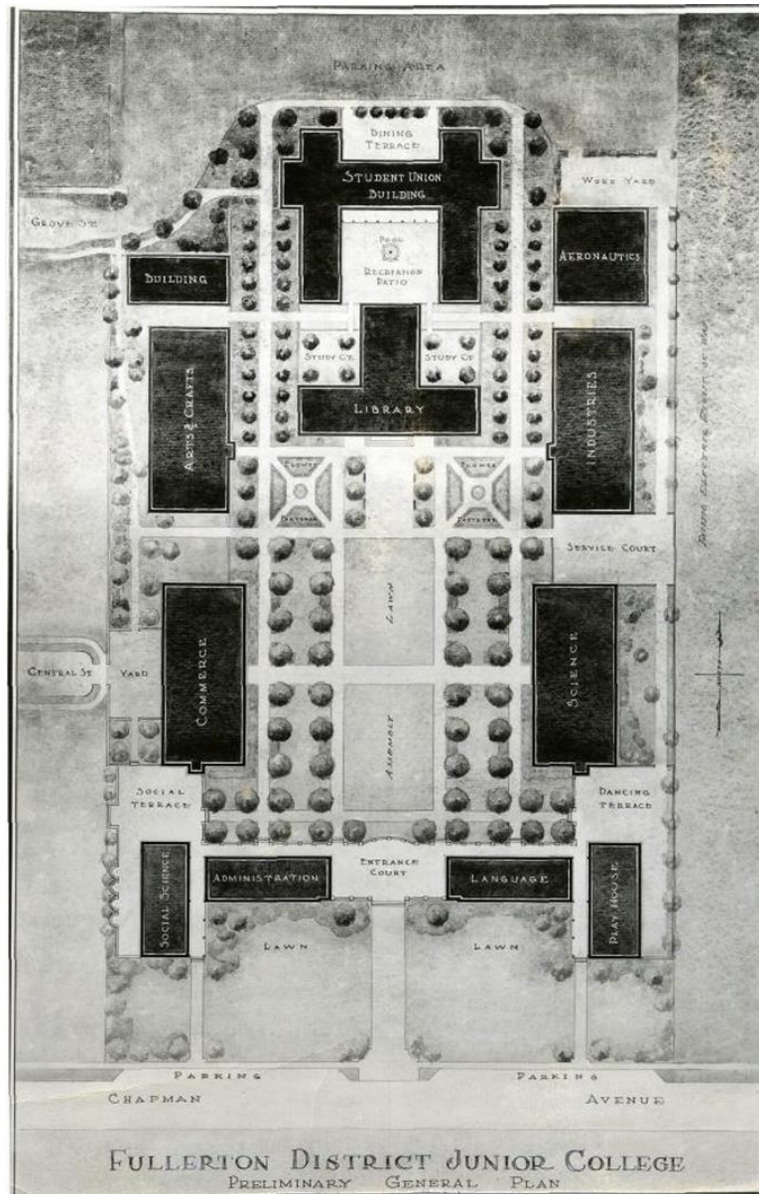


Figure 6. Vaughn's preliminary campus plan

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 7. Aerial photograph from 1940 showing the FJC Campus and Vaughn's many accomplishments during his time with FJC (Richey et al. 2012)**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Business Building 300 (1936)**

The original Commerce building (Building 300) was the first building constructed as part of Vaughn's general plan (Figure 8). It was built in 1936 at a cost of \$148,777 with PWA funding. According to Sanborn maps from 1949, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. The original interior of the building had a gymnasium, student bank, and multiple classrooms for 50% of the student body to attend classes. Classes taught at the original Commerce building included banking, finance, secretarial courses, English, and many more. Currently the building is used by Fullerton College for Business and Computer Information classes (Richey et al. 2012; Sanborn 1949; Morris et al. 2004; LAT 1936a, 1936b, 1990).



**Figure 8. 1939 photo of Commerce building**

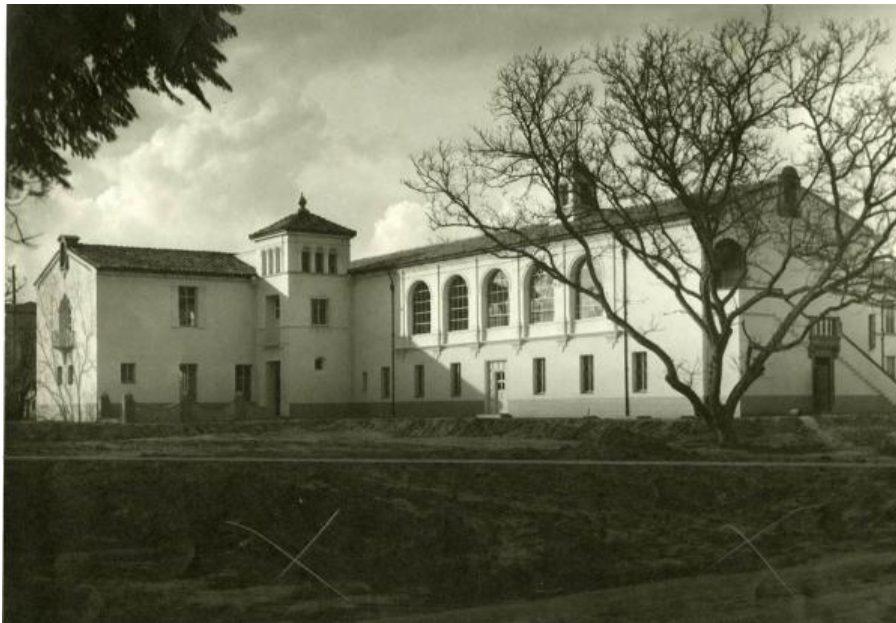


## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Administration Building 100 (1938)

The Administration and Social Sciences building was designed and constructed in 1938 for \$163,633 with PWA funding (Figure 9). The building is the second building designed and constructed by Vaughn as part of his campus plan. According to Sanborn maps from 1949, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. The original functions of the building included classrooms, administrative offices for FJC, and a student lounge. In the 1950s, FJC hired another architect (Taylor and Conner) to build an addition to the building's front elevation. The modern aesthetic of this new wing was completely incompatible with the Spanish Colonial Revival style of the original building. According to *Fullerton College: A Pictorial History*, Vaughn was so outraged by the modern addition to his original design that he refused to ever work for FJC again. The building is currently known as Administration Building 100 and still functions as the Administration building for Fullerton College (LAT 1937a, 1937b, 1938a, 1990; Richey et al. 2012; Sanborn 1949).



**Figure 9. Administration and Social Sciences building constructed in 1938**

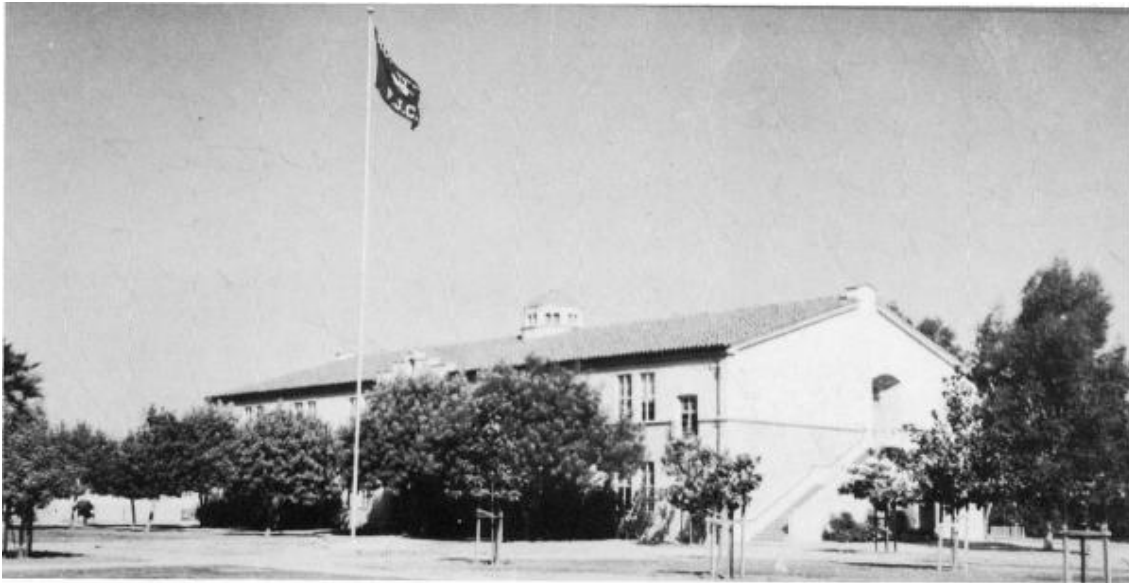


## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Math Building 600 (1938)**

The Technical Trades building, now referred to as Math Building 600, was constructed in 1938 for \$224,321 from WPA funding (Figure 10). According to the 1949 Sanborn map, the building was constructed with fireproof materials that included a reinforced concrete foundation and interior walls covered with metal lath and plaster. Although design and construction of the building was done by Vaughn, he was assisted on this building by FJC's building superintendent, William (Willy) B. Potter. Because the function of the building was Technical Trades, Vaughn was required to take extra care in the design of the structural system so that the foundation and floors did not fail once the weight and vibration of heavy machinery was introduced. Once finished, the building was used for technical trade education in welding, cabinet making, and architecture. There were traditional classrooms and shop areas throughout the building for the various trades (LAT 1938b, 1939a, 1990; Richey et al. 2012; Sanborn 1949). In 1980, a bridge was added to the south elevation of the building connecting Building 400 and Building 600. This addition is no longer extant.



**Figure 10. Technical Trades building constructed in 1937**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Greenhouse Building 401 (c. 1937)

Greenhouse Building 401 was constructed c. 1937 with WPA funding (Figure 11). The Greenhouse was an interesting mix of educational space and campus landscaping growth and development. The WPA funding also allowed for additional landscaping on the grounds. The students cultivated plants in the Greenhouse for use in their classes, but also helped the school by using plantings around the Commerce building. The creation of the Greenhouse and the WPA funding for additional landscaping was essential in the beautification of the FJC Campus and sparked this comment in a 1943 yearbook:

Inspirational beauty is the key note to the landscaping of the Fullerton campus. A vast expanse of lawn, lovely flowers, and many newly planted trees make a perfect background for the magnificent buildings of Spanish stucco. The brilliant sunshine brings every color vividly to life, the green of the grass, the tan of the buildings and the red of the roofs (Richey et al. 2012).



**Figure 11. Interior of Greenhouse, c. 1937**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Campus Services Building 840 (1940)**

The Student Union building (Building 840) began as a two-phased construction project in 1939 that was completed in 1940 for \$60,454 with WPA funding (Figure 12). Its original design was to house lockers and restrooms for FJC. The first section of the building was a one-story wood-and-stucco building that was rectangular in plan. The second phase of construction was for another rectangular section set perpendicular to the first section to the east, creating an L-shaped plan. In 1941 the building became U-shaped in plan with the addition of the Hornet Hive building, which was constructed as a café for the students. This is consistent with the 1949 Sanborn map, which shows the Student Union as a U-shaped building with the original section from 1939 creating the base of the U shape (Figure 13). The building was used for food services, locker rooms, publications, office space, and the campus bookstore (LAT 1939b; Richey et al. 2012).



**Figure 12. Student Union building under construction in 1939**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 13. 1940 Aerial photograph showing the second phase of construction on the Student Union building**

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### **T Shacks (1946)**

The increased enrollment following WWII brought about space shortages on the FJC Campus. One solution to resolve space issues was the acquisition of war surplus buildings from the Santa Ana Army Air Base in 1946. Known as the “T Shacks” (Figure 14), the buildings were originally used for administrative purposes and as barracks by the military, but were no longer needed by the end of the war. The T Shacks were acquired by FJC in 1946 and according to the 1949 Sanborn map, they were located to the north of the Shops building and the Commerce building. These temporary classroom buildings allowed FJC to make it through the post-war years until government funding for new buildings was released and also allowed for the shifting of more college-level courses away from the Fullerton Union High School site. Although these buildings were meant to be a temporary fix for the classroom shortages, they remained on the FJC Campus for decades. All of the T Shacks except one were removed from the campus in May of 1961. The remaining T Shack was relocated to the north side of the campus for the agricultural program, which is the current Horticulture Complex (LAT 1955a, 1961a, 1961b; Mudrick et al. 2015; Richey et al. 2012; Sanborn 1949).



**Figure 14. T Shacks used for classroom spaces starting in 1946**

### **3.3.2 Taylor and Conner’s Campus Expansion Master Plan (1953–1965)**

With a growing post-war population, residents of the City of Fullerton approved tax increases and bond measures in support of the development of new schools and the expansion of existing

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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campuses. FJC hired Pasadena architectural firm Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) to design a new master plan for the campus in 1953. This led to a number of new building projects on the FJC Campus, all under the architectural design of William H. Taylor, including a new Science building, Gymnasium, Library, Student Center, Technical Education building, Art–Home Economics building, Applied Arts building, and District Administration Center. In 1955–1956, the firm also designed an architecturally incompatible wing to the Administration and Social Science building, which attempted to blend the new modern style with the original Spanish style.

Taylor and Conner’s original design was for a campus-wide master plan that, in addition to multiple new buildings, included drastic changes to landscape and hardscape features. Plans called for a more streamlined look, including the addition of concrete walkways throughout the campus. Although new landscaping was added during the redesign, the number of plants, trees, and shrubs was drastically cut. As stated in *Fullerton College: A Pictorial History*, this “gradually changed the look and feel of the campus” (Richey et al. 2012). Although the construction of these buildings was much needed in terms of new classroom space/educational facilities, they intruded on college’s original Spanish Colonial Revival design, and have been viewed in a negative light by many, as recounted in *Fullerton College: A Pictorial History*:

Over the decades, the campus buildings designed in the 1930s by Harry K. Vaughn and built with federal relief funds had withstood the test of time and become eligible for listing on the National Register of Historic Places. The buildings designed by Taylor and Conner following World War II, however, were in a serious state of disrepair and no longer suited the needs of the campus. The decision was made to demolish many of the post-World War II structures and replace them with Hispano Moresque-styled buildings compatible with the historic Spanish Colonial Revival buildings constructed in the 1930s and 1940s. The result was a harmonious blending of the old and new, with the diversity of architecture making the campus more enjoyable and enriching (Richey et al. 2012).

When original 1930s FJC Campus architect Harry K. Vaughn visited the campus after the remodel, it is said that he was furious about the changes to the campus and vowed to never work with FJC again. Research indicates that many of the original Taylor buildings from the late 1950s and early 1960s have since been demolished. Extant Taylor buildings seen on the Fullerton College Campus today include the Berkeley Center (1960), the Music and Theatre Arts buildings (1967), the Art–Home Economics building (1959), the Technical Education building (1960), and various modifications to the 1930s buildings (LAT 1960; Mudrick et al. 2015; Richey et al. 2012).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Science Building (1954) – Demolished in 2010**

The Science Building (Figure 15) was the first building constructed under Taylor and Conner's plan. The two-story building was clad in stucco and rectangular in plan, featured regular fenestration, and was oriented with its main elevation facing the campus quadrangle. The building was later connected to the Technical Trades building by a pedestrian bridge. The building was the first building on campus to be used solely for mathematics and science, which had historically been taught at the Fullerton Union High School campus and not on the FJC Campus. Plans for the Science Building signed by Blurock indicate that the building was expanded in 1966. The building was demolished in 2010 to make way for the new Science Building 400 that stands today (LAT 1954b, 1954c; Richey et al. 2012).



**Figure 15. Science building, 1955**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Physical Education Building 1200 (1955)**

The Gymnasium (Figure 16) was the second building constructed under Taylor and Conner's plan in 1955. The building was noted as being the first building constructed on campus that would allow all physical education classes to be taught on the FJC Campus instead of the shared high school campus. The original building contained multiple basketball courts, locker rooms, instructional areas, and spectator seating areas. In 1956, a swimming pool and student health center were added to the building. Today the original building forms the core of the section now called the North Gym (LAT 1953, 1954d, 1954e, 1955b, 1958a, 1961c, 1962a; Richey et al. 2012).



**Figure 16. Gymnasium building constructed in 1955**



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Library (1957) – Demolished in 2003**

The two-story, reinforced-concrete library was constructed in 1957 (Figure 17). The building was irregular in plan and clad in stucco, with a complex roofline. The interior of the building included a beautiful two-story atrium and was used for a variety of functions, including studying, typing, and language listening, and also housed a faculty lounge. The building was demolished in 2003 for construction of the new library building, now referred to as the Library and Learning Resource Center Building 800 (LAT 1955c, 1957a, 1957b, 1962b, 1962c; Richey et al. 2012).



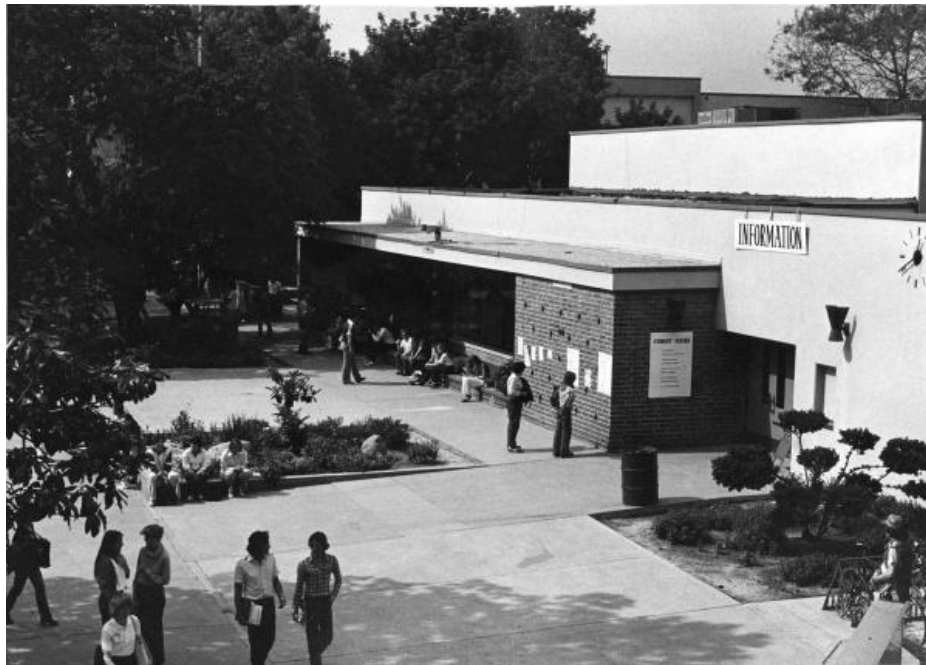
**Figure 17. Library constructed in 1957 and demolished in 2003**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Student Center (1957) – Demolished in 2007**

The two-story Student Center building was constructed in 1957 (Figure 18). The building was 11,040 square feet, irregular in plan, and clad in stucco, with a complex roof featuring a series of flat-roofed sections at varying heights. The interior was configured with a large lounge area that was 58 feet by 94 feet, with a stage at one end, so that the building not only could be used for reading and studying but could also accommodate performances and assemblies for the students. The remainder of the building was used for offices and storage. The building was demolished in 2007 and a new Student Center was constructed in approximately the same location. The current building is known as the College Center Building 200 (LAT 1955c, 1957a, 1957c; Richey et al. 2012).



**Figure 18. Student Center constructed in 1957 and demolished in 2007**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Technical Education Building 700 (1959)**

The fifth building constructed under Taylor and Conner's plan was the Technical Education building (Building 700) in 1959 (Figure 19). The original design of the building included classrooms and work areas for technical trades such as welding, drafting, fabrication, and cosmetology. The Technical Education building is also noted as the first building that allowed for parking in front of the building. It was remodeled heavily during the 2000s and retains very little of its original visual elements (LAT 1958b, 1958c, 1959a, 1959b; Richey et al. 2012).



**Figure 19. Technical Education building constructed in 1959**

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **Fine Arts Gallery 1000 (1959)**

The Art–Home Economics building (Building 1000) was constructed in 1959 (Figure 20). The original design of the building included classrooms and work areas for home-economics-related coursework such as table setting, home management, childhood development, cooking, and entertaining. The building was in keeping with the modern style that Taylor and Conner used for the other buildings on the FJC Campus. It was remodeled heavily during the 1970s with interior alterations (LAT 1959b; Richey et al. 2012).



**Figure 20. Art–Home Economics building view from top of Gymnasium**

### **Berkeley Center 3000 (1960)**

The District Administration building (Building 3000) was constructed in 1960 north of the main FJC Campus on Lemon Street (Figure 21). The District Administration building housed various administrative offices for the affairs of various schools, including but not limited to FJC (LAT 1959c; Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 21. District Administration building constructed in 1960**

### **Humanities Building 500 (1962)**

The Applied Arts building (Building 500) was designed by Taylor and Conner in 1962 (Figure 22). The two-story building was designed primarily as classroom space with a few offices. Subjects taught in the building included medical assisting, dental assisting, journalism, psychology, and merchandising. German, French, Spanish, and Russian classes were also taught in the Applied Arts building. It is also important to note that the Applied Arts building was one of the first buildings at FJC to have air-conditioning units. Today the building continues to be used for Applied Arts and Humanities studies. It also serves as the Humanities Division office and the Veterans Resource Center (Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 22. Applied Arts building constructed in 1962**

### **Music Building 1100 (1967)**

The last buildings constructed on the FJC Campus under the Taylor and Conner plan were the Music and Theatre buildings. The Music building (Building 1100; Figure 23) was designed for rehearsals as well as instrument storage and classroom space. The building included a stage, practice rooms, classrooms, storage and repair rooms, a uniform and robe room, and dressing rooms. The construction of the Music building allowed the music instruction at FJC to be shifted from the high school to the FJC Campus. Although research indicates that this building was under construction when FJC replaced Taylor and Conner in 1965, the architectural plans on file suggest that the building was completed with Taylor's designs and the Music and Theatre buildings were the last of Taylor's designs to be built on the FJC Campus. Today the building is still used as the Music building and also houses the Fine Arts Division office (LAT 1963a, 1963b, 1964a, 1964b, 1965d, 1966a; Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 23. Music building constructed in 1967**

### **Theatre Arts Building 1300 (1967)**

The Theatre building (Building 1300; Figure 24) was constructed at the same time as the Music building by Taylor and Conner. The building included a sound/projection booth, four dressing rooms, an auditorium, and basement storage for set dressing items. Although research indicates that this building was under construction when FJC replaced Taylor and Conner in 1965, the architectural plans on file suggest that the building was completed with Taylor's designs and the Music and Theatre buildings were the last of Taylor's designs to be built on the FJC Campus. Today the building is referred to as the Theatre Arts building and houses the Campus Theatre and Box Office (LAT 1963a, 1964b, 1965d, 1966a; Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 24. Theatre building constructed in 1967**

### **3.3.3 Blurock's Campus Expansion Projects (1965–1984)**

In 1965 FJC made the decision to terminate its agreement with Taylor and Conner and move forward with hiring William E. Blurock as the FJC Campus architect. Blurock's first contribution to the FJC Campus was the construction of an addition to the Library building. By the time Blurock began his tenure at FJC, the 1957 Library had outgrown its building and more space was required to meet the increasing enrollment numbers. Blurock completed the library addition by 1968. Blurock was also responsible for an addition to the Science building and renovations and additions to numerous other buildings on campus. During the 1960s and 1970s, FJC grew and expanded based on the needs of the students and of the industries that would be recipients of FJC graduates. Blurock completed numerous renovations to the existing buildings on the FJC Campus but was also responsible for the buildings described in this section during his time at FJC (LAT 1965e, 1966b, 1966c, 1967b, 1971a, 1971b; Richey et al. 2012).

#### **Child Development Center Buildings 1800 Complex (c. 1980)**

The Child Development Center Complex (Figure 25) was constructed c. 1980 and featured relocatable buildings combined with a section of new construction used to create an L-shaped plan for the building.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 25. Child Development Center Complex**

### **Media Services/Academic Computing/Maintenance and Operation Shops Building 2300 (c. 1970)**

According to architectural plans from the North Orange County Junior College District Division of Physical Plant and Facilities from July 1970, the Math Audio–Tutorial building (Building 2300) was a one-story relocatable building (Figure 26) that was renovated to serve as a building for the Mathematics and Engineering Division. The building was relocated to the west of the 500 Building and is currently used for the Media Services, Academic Computing, and M&O Shops.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 26. Math Audio–Tutorial building constructed c. 1970**

### **Student Services Building 2000 and Pedestrian Bridge (1984)**

The Student Center design and construction began in 1982 and was completed in 1984 by Blurock's firm. The Student Center (Building 2000) was located in the recently acquired tract of land purchased by Fullerton College in 1980. Due to the location of the Student Center, Blurock's firm also designed a connector bridge to cross Chapman Avenue (Figure 27). The building was designed to house a Bookstore, Disabled Student Services office, and Career Center, as well as the Admissions Department and the Bursar's office. Today the building houses the Admissions and Records, Bookstore, Bursar, Career and Life Planning Center, Counseling, Distance Education, and Extended Opportunity Programs and Services/Cooperative Agencies Resources for Education (EOPS/CARE) (Richey et al. 2012).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 27. Pedestrian Bridge and Student Center constructed in 1984**

### **3.3.4 Chapman and Wilshire School Acquisition (1980–1984)**

In 1980, the District acquired the Chapman School and Wilshire Junior High School (Wilshire School), located across the street on the south side of Chapman Avenue. The District renovated the buildings and turned them into the Wilshire Continuing Education Center in 1983. Once renovations were completed, the school started operations in the buildings in 1984. The purchase of the schools came with undeveloped land that Fullerton College intended to use for further expansion and development, including the construction of a new Student Center in 1984 designed by Blurock (Richey et al. 2012).

Although the Wilshire School buildings are the only buildings remaining on the plot to the south of Chapman Avenue, there was another school located beside the Wilshire School known as the Chapman School. According to a 1949 Sanborn map of the area, the Wilshire and Chapman Schools were multi-building school complexes arranged on a large parcel of land to the south of FJC. The Chapman school grounds were composed of a large one-story school building with an L-shaped plan, a roughly rectangular one-story building to the east labeled as Kindergarten, a playground to the east, and a one-story cafeteria building (Sanborn 1949).

The Wilshire School is also shown on the Sanborn map from 1949 as a three-building school complex. The Wilshire School appears to be oriented toward Wilshire Avenue, with two one-story classroom buildings that appear to be rectangular in plan and connected by an open

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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walkway between the buildings. To the north of the classrooms stands a building labeled Auditorium, which is the Wilshire Theatre (Sanborn 1949).

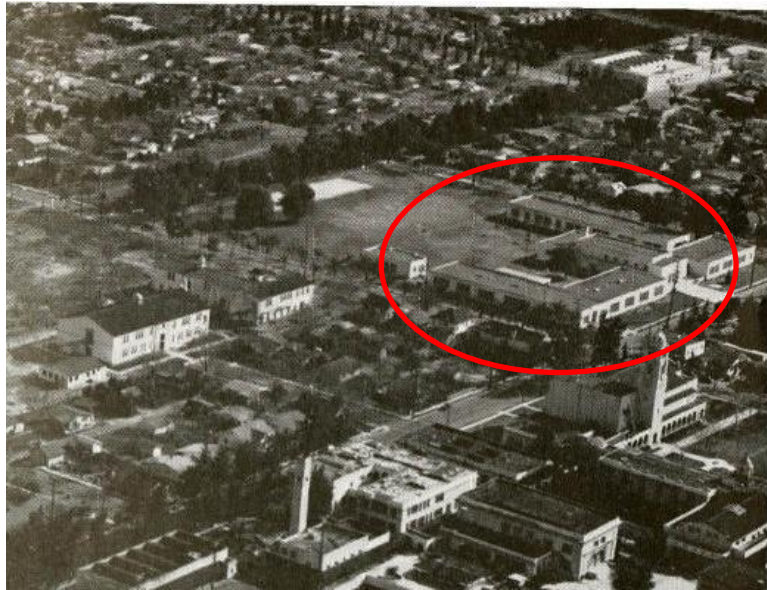
According to a California Department of Parks and Recreation (DPR) Historic Resources Inventory Form from 1979, the following information was recorded about the Wilshire Junior High School property:

Wilshire Junior High School bounded by Lemon, Chapman, Lawrence, and Wilshire is the latest building in an area which has been in continuous use for educational institutions since 1889. The first was a small red brick school house, constructed a year after the formation of the Fullerton Elementary School District near Lemon & Wilshire. The structure was in constant use and was modernized through the years until 1914 when it was replaced by a new, twelve-room building, the Wilshire School. By this time enrollment had increased from 333 in 1906 to 470. In 1919 the School District acquired the rest of the land around Wilshire School and in 1921, Chapman School, at the corner of Lemon and Chapman, was built. By 1924 two additional elementary schools, Ford and Maple had been constructed elsewhere in town, and average daily attendance in the District had increased to 1,336. The 1933 earthquake caused severe damage to this complex and in 1934 it was deemed necessary to make repairs and reconstruction. The Chapman School was restored and one classroom added for a total of 14 classrooms, and Wilshire School was totally demolished. The building was replaced by a new structure and an auditorium was built between it and Chapman School, joined by an archway. Wilshire School area was the location for a soup kitchen during the Depression (DPR 1979).

The current Wilshire School buildings were designed by Donald Beach Kirby in 1936 using PWA funding. The original Wilshire School was heavily damaged during the earthquake in 1933 and was unable to be saved. Kirby's new school buildings dominated the block between Chapman Avenue and Wilshire Avenue, as shown in the aerial photograph from 1938 (Figure 28). Today three buildings remain from Kirby's original designs: the Wilshire Theatre, 100 Wilshire Avenue, and 200 Wilshire Avenue. The school shut down in the early 1980s and the District purchased these buildings and renovated them for use as an Auditorium and Continuing Education Center (Epting 2014; LAT 1983).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 28. 1938 Aerial photograph looking southeast, showing the Wilshire School buildings (circled) to the south of the FJC Campus and Fullerton Union High School campus**

### **Wilshire Theatre Building 2100 (1936)**

The school purchase included the Wilshire Theatre (Figure 29), which was constructed in 1936 using PWA funding. The building was designed in the PWA Moderne style by architect Donald Beach Kirby (1905–1980). According to the 1949 Sanborn map, the Auditorium building was between the Wilshire School and the Chapman School and oriented with the entrance to Harvard Avenue. The Sanborn map shows the building as a two-story building that was constructed using fireproof reinforced concrete and a steel truss roof system. The map also notes a large stage area to the east side of the building's interior and a boiler room to the rear of the building. According to information provided in *Fullerton College: A Pictorial History*, "The auditorium was the first project approved for construction using federal Depression-era relief funds in Orange County" (Richey 2010; Richey et al. 2012; Sanborn 1949).



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Figure 29. Wilshire Theatre**

### **Wilshire School Building W100 (1936)**

The Wilshire School Building 1 was constructed in 1936, is located on the corner of Wilshire Avenue and Lemon Street, and is now known as the W1 Building or the 100 Wilshire Building (Figure 30). According to the information available from the 1949 Sanborn map, this building was a one-story building constructed in the PWA/WPA Moderne style and was originally part of the Wilshire School. The building functioned as a junior high school until it closed in the early 1980s. The District now uses the building for Continuing Education. The interior of the building has been renovated multiple times over the years, but the exterior retains much of its original PWA/WPA detailing.



**Figure 30. Wilshire School Building 1**

### **Wilshire School Building W200 (1936)**

The Wilshire School Building 2 was constructed in 1936, is oriented to face Wilshire Avenue, and is connected to Wilshire School Building 1 by a porte cochère. The building is currently

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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known as the W2 Building or the 200 Wilshire Building. According to the information available from the 1949 Sanborn map, this building was a one-story building constructed in the PWA/WPA Moderne style that was originally part of the Wilshire School. The interior of the building has been renovated multiple times over the years, but the exterior retains much of its original PWA/WPA detailing. No historic photographs of this building were located.

### **3.3.5 Chapman Avenue Residential Acquisitions (1980s, 1990s)**

During the 1980s and 1990s, Fullerton College acquired residential properties to the south of the main Fullerton College Campus on Chapman Avenue as part of their campus expansion plan. The residential properties located south of Chapman Avenue were originally multi-family or single-family residences that maintain their original uses or remain vacant. The only alterations made to the vacant properties were boarding up entry points to prevent vagrancy. Three of the residential properties were previously evaluated by GPA in 2015 and do not require additional evaluations for the purposes of this study. The previously evaluated buildings include 428 East Chapman Avenue, 434 East Chapman Avenue, and 438 East Chapman Avenue. Dudek evaluated all remaining properties on the project site, which include 325–327 North Newell Place, 409 North Newell Place, 416 East Chapman Avenue, 418 East Chapman Avenue, and 420 East Chapman Avenue. The City of Fullerton and the Orange County Assessor's office were unable to provide information on the properties in question. Visits were made in person to the Assessor's office and Permits office on March 22, 2017, and all possible building information was obtained at that time. City Directories for the City of Fullerton were accessed in person at the Fullerton Public Library Local History Room on March 22, 2017.

## **3.4 Campus Architectural Styles**

### **3.4.1 Spanish Colonial Revival (1915–1940)**

The Spanish Colonial Revival style has a rich history and popularity in California with a basis in Spanish architectural forms that were heavily influenced by the richness of the history of Spain. One huge influence on the history of Spain is the Moors. The Moors were in control of Spain for many years and made a truly significant impact on the architectural development in many Spanish cities like Seville. The Moors brought with them a rich Muslim tradition that was based on the Islamic patterns of development seen throughout the Middle East (NGS 2017). The combination of the Spanish and Moorish influence became known as the Hispano-Moorish (also referred to as Hispano-Moresque) architectural style. The height of Hispano-Moorish architecture in the Iberian Peninsula was from the 8th century to the 15th century and there was a significant revival during the 19th and early 20th centuries throughout Europe and the Americas (Curl 2006).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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During the Spanish colonial period in the late 1400s the architectural traditions known as the Hispano Moorish style were brought to the Americas. The convergence of Christian and Islamic traditions seen in America is most often referred to as Mudèjar. The convergence of religious and architectural traditions during the Spanish Colonial period set the stage for the Spanish Colonial Revival architectural movement that gained great popularity in the 1920s and 1930s in Southern California (Khalidi, SIC 2017, SOHO 2007).

Deeply rooted in Spanish and Islamic traditions, Hispano-Moorish architecture became a uniquely Southern California tradition following the 1915 Panama-California Exposition in San Diego. Drawing not only from the rich heritage of Southern California and building on the traditions of the incredibly popular Mission Revival movement, architect Bertram G. Goodhue chose to elaborate and ornate the style to new levels with his interpretation of the Spanish Colonial principles and precedents from both Spain and Mexico. The elaborate ornament used by Goodhue and the Spanish Colonial Revival architects he influenced was specifically referred to as Churrigueresque (Bevil 1995, SIC 2017, SOHO 2017). Goodhue's use of the Spanish Colonial Revival style with Churrigueresque ornament at the 1915 Exposition was an inspiration to architects and designers throughout California. While revivalist styles were popular throughout Southern California, some cities like Fullerton embraced the Spanish Colonial Revival style above all others. The City went so far as to make Spanish Colonial Revival its preferred form of architecture for commercial and civic buildings in the 1920s (McAlester 2015; FH 2008; SDHC 2017).

The most significant character-defining features of the Spanish Colonial Revival style include the following:

- Low pitched roofs with clay tiles
- Stucco walls
- Simple rectangular or L-shaped plans
- Asymmetrical façades
- Churrigueresque detailing and features around windows and entryways
- Arched entryways
- Irregular fenestration
- Elaborately carved wood entry doors
- Wrought-iron balconies
- Interior decorative tile work



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Arcaded walkways
- Recessed doors and windows

Due in large part to the City's preference for the style, Fullerton's most notable commercial/civic examples of the style are the Masonic Temple built in 1920 and the California Hotel built in 1922 (DSD 2002; Foster 330-333; McAlester 2015). According to Fullerton Heritage, the City also retained many residential examples of the Spanish Colonial style, including the following:

- Muckenthaler Estate, 1923
- The Grieves Apartments, 1924
- Clinton Smith House, 1924
- William Winter House, 1926
- Gowen House, 1928
- Dewella Apartments, 1929
- Foster House, 1929
- Cleaver House, 1929

Examples of Spanish Colonial Revival style architecture on campus include the following buildings. Note that the Spanish Colonial Revival Style buildings on the Fullerton campus also exhibit architectural details that reflect the Churrigueresque style of architecture, including scalloped entrances, horseshoe arches, and tile work.

- Business Building 300
- Greenhouse Building 401
- Math Building 600
- Administration Building 100
- Student Union Building 840

### **3.4.2 Craftsman (1905–1930)**

The Craftsman architecture movement in the United States is one of the most prevalent and widespread movements, which appealed to almost all social classes. One of the most notable architectural developments arising from the Craftsman movement is the Bungalow. The Arts and Crafts movement began in the mid-late part of the nineteenth century in England as a reactionary movement against the excessiveness and ostentatious designs of the Victorian era. One of the key contributors to bringing the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Craftsman movement to the United States was Gustav Stickley. His work and efforts helped fuel the development of the Craftsman movement and spread it across the United States. Upon its arrival in California, the Craftsman movement produced a truly unique California architectural form: the California Bungalow. Developed by the work of Greene and Greene in Pasadena, the California Bungalow became one of the most widespread architectural movements in California.

The adaptation of the Greene and Greene Bungalow model for the masses contributed to its appeal and application to meet the needs of the housing booms happening across California following World War I. Even though Greene and Greene designed very high-style versions of the California Bungalow, builders and contractors began to mass-produce designs for the homes in pattern books and made them more available to the public.

The California Bungalow is characterized by the following features:

- Overhanging eaves
- Distinct horizontal lines
- Low pitched roof designs
- Wood shingle detailing, porches
- Maximum of two stories, mostly one story or one-and-a-half stories
- Paired windows
- Craftsman style doors
- Tapered wooden porch supports
- Extensive use of natural materials and finishes
- Brick and/or stone chimneys
- Exposed roof beams

Although the Greene and Greene bungalows represent the highest artistic and pure forms of the movement, it is in the modest application that cities like Fullerton were able to latch onto the high-style tradition and make it their own (DSD 2002; Makinson 1977; McAlester 2015; SurveyLA 2016). Buildings within the project area that exhibit characteristics of the Craftsman style include:

- 325-327 North Newall Place
- 420 East Chapman Avenue
- 428, 434, and 438 East Chapman Avenue

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.4.3 PWA/WPA Moderne (1933–1944)**

During the Great Depression and the years shortly thereafter a new architectural form emerged called PWA Moderne. Under New Deal initiatives from President Roosevelt, the Works Progress Administration (WPA) and the Public Works Administration (PWA) were created. Like other New Deal programs, the WPA and the PWA were focused on creating American jobs in the Depression Era. The WPA was responsible for providing government relief to cities for materials and labor, whereas the PWA was established to provide funding for private contractors for public works projects, including but not limited to bridges, civic buildings, airports, schools, hospitals, and dams. Both programs were essential in the development of the PWA/WPA Moderne style of architecture and for putting many people back to work during the economic crisis.

Given the economic state of the country, it makes sense that the PWA/WPA Moderne style would be somewhat simplistic in nature and use readily available materials to keep project costs low. In addition to simplicity and readily available materials, the PWA/WPA Moderne style has the following character-defining features:

- Use of conservative elements and materials such as concrete
- Monumental feel
- Rectangular massing
- Zigzag ornamentation
- Balanced and symmetrical forms based on Classical design principles
- Windows arranged as vertical recessed panels
- Stucco or stone walls

The Wilshire School buildings, which are now part of the Fullerton College Campus, serve as good examples of the PWA/WPA Moderne style. It is also notable that the Wilshire Theatre building was the first PWA building constructed in Orange County (DSD 2002; Epting 2014; Morris et al. 2004).

### **3.4.4 Mid-Century Modern (1933–1965)**

Following WWII, the United States had a focus on forward thinking, which sparked architectural movements like Mid-Century Modern. Practitioners of the style were focused on the most cutting-edge materials and techniques. Architects throughout Southern California implemented the design aesthetics made famous by early Modernists like Richard Neutra and Frank Lloyd Wright, who created a variety of Modern architectural forms throughout Southern California.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The Mid-Century Modern movement in Fullerton, as in other cities in the United States, was characterized by simplistic and clear uses of materials and structural components, open interior planning, and large expanses of glass. Mid-Century Modern flourished in Fullerton housing forms and in school constructions supporting the post-war housing boom. The cost-effective nature of the style and the ability to mass-produce Mid-Century Modern building materials like concrete, wood, steel, and glass made it the perfect style for growing cities like Fullerton. Today there is a Fullerton Heritage Driving Tour that includes numerous examples of Mid-Century Modern architecture, including the following (City of San Diego 2007; DSD 2002; FPL n.d.):

- Forever Houses, 1954
- Nicolas Junior High School, 1956
- Hunt Foods Foundation Library, 1962
- Fern Drive Elementary School, 1954
- Golden Hills Elementary School, 1950

Characteristics of the Mid-Century Modern style include the following:

- One to two stories in height
- Post-and-beam construction using wood and/or steel
- Cantilevered canopies and overhangs
- Little to no exterior ornamentation
- Simple lines and geometric patterns
- Emphasis on function and simplicity
- Open floor plans
- Buildings sheathed in stucco, wood, brick, or steel frame with glass
- Flat roof designs
- Flush-mounted metal frame and clerestory windows
- Large expanses of windows
- Simple size and massing
- Use of simplistic geometric shapes
- Use of covered walkways with geometric canopies using such forms as butterfly or folded plate

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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- Indoor/outdoor integration
- Exterior staircases, decks, patios, and balconies

Examples of Mid-Century Modern buildings on the Fullerton College campus include:

- Physical Education Building 1200
- Fine Arts Gallery 1000
- Berkeley Center Building 3000
- Humanities Building 500
- Theatre Arts Building 1300

### 3.4.5 New Formalism (1954–1970s)

In the City of Fullerton, the New Formalism movement emerged in the 1950s and lasted until the early 1970s. The New Formalism movement emerged as a reactionary movement against the International style. Some of the most acclaimed architects of the style are Edward Durrell Stone, Philip Johnson, and Minoru Yamasaki, who all had experience working in the International style but wanted to create a more formal and ceremonial form of architecture that was strongly rooted in Classical design motifs and principles. The design of the New Delhi American Embassy in by Edward Durrell Stone is often noted as the starting point for the New Formalism movement.

Characteristics of New Formalism:

- Incorporation of formal landscapes and central plazas
- Use of classical features such as columns, arches, and colonnades
- Monumental style scale and massing, often set atop a visual podium
- Use of extravagant materials like granite, marble, and travertine
- Symmetrical façade design
- Use of arched supports
- Use of concrete screens

The New Formalism movement had its limitations, in that it was used primarily in large-scale cultural and institutional buildings with little use in other architectural sectors. Examples of New Formalism in the United States include Lincoln Center in New York City, the Los Angeles Music Center, and the Kennedy Center for the Performing Arts in Washington DC.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Smaller cities and universities also embraced the New Formalism style, and examples of the style are seen in Fullerton with the City Hall built in 1963 and the Western University College of Law built in 1975 (City of San Diego 2007; DSD 2002; Gebhard 2003; McAlester 2015). The Fullerton College Music Building 1100 serves as an example of New Formalist style educational architecture.

### **3.4.6 International Style (c. 1925–present)**

The International style of architecture came to Los Angeles in the early 1920s and flourished under architects like Richard Neutra and R.M. Schindler. The style became very popular in almost all forms of architecture, using precise and universal materials and techniques that allowed the style to be used anywhere in the world. The strong Bauhaus roots of the movement incorporated simple and precise designs and incorporated mass-produced materials such as concrete, steel, and glass. Functionality in design was also one of the highest priorities of the style.

Characteristics of the International style:

- Flat roof structure
- Little decoration or ornamentation
- Glass curtain walls
- Open interior spaces
- Smooth wall surfaces, usually clad with stucco
- Strong linear lines
- Large concrete expanses
- Use of modern materials such as metal windows, concrete, and steel
- Flush-mounted metal windows
- Asymmetrical design

The City of Fullerton's International style buildings include the Beckman Instruments Headquarters (1953), Fullerton Community Bank Building (1960), and Hunt Administrative Building (1960) (City of San Diego 2007; DSD 2002; Gebhard 2003; McAlester 2015).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.5 Campus Architects**

#### **3.5.1 Harry K. Vaughn (1882–1962)**

Harry K. Vaughn (1882–1962) was born in Wisconsin and moved to San Diego in 1906. Shortly after his arrival in San Diego, Vaughn became a draftsman for the architectural firm of Hebbard and Gill. After the dissolution of the Hebbard and Gill partnership in 1907, Vaughn made the decision to stay on with Hebbard as a draftsman. His career continued under Hebbard until 1913, when he went to work for Carleton M. Winslow. With Winslow's appointment to Architect in Residence for the Panama–California International Exposition in San Diego, Vaughn gained valuable experience working with Winslow at the exposition to design many of the temporary buildings. Following Winslow's success at the exposition, he and Vaughn relocated to Los Angeles. While living in Los Angeles, Vaughn obtained his certification in architecture after completing the required coursework at the University of California. While working with Winslow, Vaughn also worked with another noted architect, Irving Gill. Vaughn's first experiences with the FJC began when Winslow was named the Fullerton College architect in 1919. During his time under Winslow, Vaughn designed and supervised numerous construction projects. Vaughn also began to make a name for himself and was hired to design the Louis E. Plummer residence in 1927. The superintendent's fondness for Vaughn likely influenced the Board of Trustees on the decision to hire Vaughn for the new FJC Campus project in 1933.

Following in the footsteps of his previous employers, Vaughn was greatly influenced by the Spanish Colonial Revival style and incorporated it into his designs for FJC. Vaughn designed the following buildings during his time at FJC:

- Business Building 300, 1936
- Greenhouse Building 401, c. 1937
- Administration Building 100, 1938
- Math Building 600, 1938
- Campus Services Building 840, 1940

Throughout Vaughn's time at FJC, he built a following and was asked to take on other architectural projects in the City of Fullerton, including the Fullerton Public Library. A great deal of Vaughn's work was based on WPA funding; once the WPA work was completed, Vaughn returned to San Diego and continued his architectural career with the California Department of Public Works, Division of Architecture (Michelson 2015a; Richey 2010; Richey et al. 2012; Morris et al. 2004; Flanigan 1987).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **3.5.2 Ralph D. Cornell (1890–1972)**

Ralph D. Cornell (1890–1972) was born in Nebraska and relocated to California in 1908. Following his graduation from Pomona College in 1914, he continued his studies at Harvard University and in 1917 was awarded the degree of Master Landscape Architect. Prior to his service in World War I, Cornell worked as an architect at the firm of Harries and Hall in Toronto, Canada. Upon his return from the war, Cornell settled in Los Angeles and opened one of the very first practices specializing in landscape architecture (Tyack 2011; TCLF 2014; Michelson 2015b). His principal works in California include Hillside Memorial Park Cemetery (1945); Los Angeles Civic Center Grounds (1956); Beverly Gardens Park (1931); Glen Haven Memorial Park (c. 1940); Restoration of Rancho Los Cerritos (1931); Grand Park (1956); Los Angeles Mall (1973–1975); Los Angeles Department of Water and Power Grounds (c. 1959); Pasadena’s Central Park (1927); Pasadena’s Washington Park (1922); Pomona College Grounds (beginning in 1919); Los Angeles Music Center Grounds; University of California, Los Angeles (UCLA) Grounds (beginning in 1937); and Torrey Pines (1922).

His professional architectural firms included the following:

- Cornell and Payne Landscape Architect and Wild Garden Specialist (1919–1924)
- Cook, Hall and Cornell (1924–1933)
- Cornell, Bridgers and Troller (1955–1969)
- Cornell, Bridgers, Troller and Hazlett (1969–1972)

Cornell’s work at FJC began in 1935 when he teamed with Vaughn to create the general campus plan for FJC’s new site. Heavily influenced by the University of Virginia campus, Cornell and Vaughn sought to design a series of pathways, walkways, and open spaces that worked cohesively with the surrounding buildings (Epting 2014).

Cornell’s design aesthetic was restrained and thoughtful of the natural environment. In addition to his numerous residential and public projects, Cornell also served as a landscape architect at Pomona College (1919–1959), UCLA (1937–1972), and University of Hawaii (1928–1972). Another notable point in Cornell’s career was that he was appointed as Landscape Architect Consultant for the Federal Relief Administration in 1935. Cornell’s contributions to Southern California landscape architecture were fundamental to the development of the Southern California landscape (Tyack 2011; TCLF 2014; Michelson 2015b).

### **3.5.3 Donald Beach Kirby, Architect (1905–1980)**

The principal works of Donald Beach Kirby (1905–1980), the architect for the Wilshire School buildings, include the Maharajah of Indore Residence in Santa Ana (1940), Player’s Café in



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Hollywood (1941), Miss Burke's School in San Francisco (1950), Castle Air Force Base in Merced (1953), Post Library Presidio in San Francisco (1958), Hunter's View Public Housing in San Francisco (1955), and Upper Noe Fieldhouse in San Francisco (1955). Born in Denver and educated at the University of Pennsylvania, Kirby came to Los Angeles in 1929 and worked under two accomplished California architects for a few years. Although Kirby's training under Reginald D. Johnson and Gordon B. Kaufmann lasted a short time, Kirby decided to go out on his own in 1933. From 1934 to 1942 Kirby served as the National Housing Administration director. In 1945, Kirby relocated to San Francisco, continued a very successful architectural practice, won awards from the AIA and Association of School of Administrators for his work on the Burke School, and won the Certificate of Distinguished Service from the AIA. During his time in Southern California, Kirby designed the Wilshire Junior High School buildings using WPA funds (AIA 1970; AR 1952; AF 1956; Marsh 1994; Michelson 2015c; Lowe 1986; Priaulx 1957; SDU 1957; SFC 1980; *Who's Who* 1974–1975).

### **3.5.4 William Henry Taylor, Architect (1912–1995)**

William Henry Taylor (1912–1995), a prominent architect in the San Gabriel Valley whose principal works during the mid-century include the Public Bathhouse and Pool in Palmdale (1951); 3164 Brookdale Road in Studio City (1952); Pasadena City College buildings (1954); Whittier Intermediate School (1956); Wilson Junior High School in Glendale (1956); the first FJC Science building, Gymnasium, Library, Student Center, Technical Education building, and Art–Home Economics building (1960); the FJC Applied Arts building (1962); the FJC Administration building expansion (1964); the FJC Music and Theatre Arts building (1966); the FJC Library expansion (1969); residences in the Poppy Peak Drive district in Pasadena (1968); and the Pasadena Unified School District Services Center (1970). In 1953, FJC started its second expansion phase, which continued into the 1960s. The Pasadena architectural firm of Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) was selected by the FJC trustees to develop a new master plan for the campus, with Taylor serving as the buildings' principal designer.

Taylor's work on the Poppy Peak District in Pasadena, California is perhaps one of the best examples of his Mid-Century Modern aesthetic. Taylor, who often partnered with Kenneth Nishimoto on projects, designed the 1615 Poppy Peak Drive residence. As described on the district's NRHP nomination form:

The district is characterized by a density of excellent examples of Modern 20th century residential architecture designed by a range of architects, including internationally renowned masters, nationally influential architects, and regionally and locally recognized architects, who were also responsible for a wide range of projects in Pasadena and Southern California. This diverse group, including Lyman Ennis, James Pulliam; Kenneth Nishimoto, Buff, Straub & Hensman,

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Leland Evison, Harwell Hamilton Harris, Richard Neutra, William Henry Taylor and Robert Cox, among others, is represented by the wide range of expressions of Modern residential architecture from the mid-1930s to the late 1960s. The district is further distinguished in having atypical, early work by famous architects as well as houses that represent their classic “signatures”; the former embodied by Harris’s Laing House, rendered in an International Style not typically associated with his mature work, and the Perkins House by Richard Neutra, a quintessential example of Neutra’s 1950s work (Lamprecht and Paul 2008:5).

The NRHP district nomination form notes that all of these architects “shared the trait of interpreting Modernism individually.” Many of the architects also built houses for themselves or had family members and clients that lived in the residences, including Taylor and his brother. Many of the architects for Poppy Peak had also fought in World War II. Taylor and Nishimoto were such close friends that Taylor accompanied Nishimoto to a Japanese internment camp and attempted to secure his release by assisting as an architect for the war effort (Lamprecht and Paul 2008).

Taylor also served as a member of the Housing Research Council of Southern California with local masters like Whitney R. Smith who served as Chairman, working on a “non profit organization composed of architects, engineers and planners in private practice who are interested in research into all fields of housing, in an effort to reduce costs and raise standards (HRC 1953).”

He was also part of the Pacific Architects Collaborative at 25 S. Euclid Avenue in Pasadena. The group comprised eight principal architects and their associated firms, each with extensive experience in Southern California (Independent Star News 1962).

In the 1960s, building and expansion plans continued with the architectural and design services of Taylor and Conner. Taylor would go on to design several more buildings for the Fullerton Union High School and FJC, including an Auto Shop Facility, an Applied Arts building, a Music building, and a Theatre building (AIA 1962; Richey et al. 2012).

### **3.5.5 William E. Blurock, Architect (1922–2012)**

William E. Blurock (1922–2012) was born and raised in Los Angeles, California. He graduated from the University of Southern California School of Architecture in 1947, despite his studies being interrupted at the onset of WWII. While stationed in Foggia, Italy, Blurock flew 62 missions as a P-38 Lightning Fighter Pilot for the U.S. Army Air Corps 82nd Operations Group, flying over parts of Europe and North Africa. At the end of the war, he stayed abroad for one year to complete coursework at the University of Florence, School of Architecture, before returning to California and completing his degree in architecture (Bissell 2012; Michelson 2015d).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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His professional architectural firms included the following:

- Blurock, Pleger, Hogan and Ellerbroek, Architects, Orange County, California (1952–1959)
- William E. Blurock and Associates, Architects; Principal, William Blurock Associates, Newport Beach, California (1960–1974)
- William Blurock & Partners, Newport Beach, California (1975–1982)
- The Blurock Partnership (TBP), Newport Beach, California (1983–1994)

Examples of his work on other educational buildings in Orange County between the 1950s and 1970s include the following:

- Orange Coast College, Costa Mesa, California: 1950s Facilities Master Plan (association with Richard Neutra/Robert Alexander) and 1970 Facilities Master Plan
- University of California, Irvine: 1965 Original Master Plan, Phases I and IA (association with William Pereira)
- Fullerton College, Fullerton, California: 1970 Facilities Master Plan
- Golden West College, Huntington Beach, California: 1972 Master Plan Update
- Saddleback College, Mission Viejo, California: 1976 Campus Master Plan
- Coastline Community College, Fountain Valley, California: 1978 Facilities Master Plan
- Irvine Valley College, Irvine, California: 1978 Original Facilities Master Plan

# **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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## **4 CULTURAL RESOURCES SURVEY**

### **4.1 Methods**

Dudek Architectural Historians Samantha Murray, MA, RPA; Sarah Corder, MFA; and Kara R. Dotter, MSHP, conducted a pedestrian survey of the project site on February 20, 2017. The project site includes an entirely developed active college campus and a small residential section across the street from the main Fullerton College Campus on the south side of Chapman Avenue. Although intensive-level archaeological survey methods (i.e., regularly spaced pedestrian transects) were not warranted, Ms. Murray spot-checked areas of exposed sediment throughout. All buildings and structures that were constructed prior to 1972 were photographed, researched, and evaluated in consideration of CRHR designation criteria and integrity requirements and in consideration of potential impacts to historical resources under CEQA. The 45-year rule was established by OHP in recognition of the fact that there is often a lag time between the point at which resources are identified and the date that planning decisions are made on projects. The survey entailed walking all portions of the campus and documenting each building with notes and photographs, specifically noting their character-defining features, spatial relationships, and observed alterations.

Dudek documented the fieldwork using field notes, digital photography, close-scale field maps, and aerial photographs. Photographs of the project site were taken with a Canon Power Shot SD90 digital camera with 12 megapixels and 3× optical zoom; a 20-megapixel Canon EOS Rebel T5i DSLR with an EF-S 18-55mm f/3.5-5.6 IS STM lens; and a Canon Power Shot SX160 IS digital camera with 16 megapixels and 16× optical zoom. All field notes, photographs, and records related to the current study are on file at Dudek’s Pasadena, California, office.

### **4.2 Description of Surveyed Resources**

Table 3 provides an overview of all buildings and structures surveyed as part of the cultural resources study, including a photograph of each building, current building name, current building number (if applicable), historic building name (if applicable), year built (if known), a general physical description of the building, and any alterations identified either through building development research or during the cultural resources survey. Dates and details of construction and alterations were confirmed through building development research conducted on the District facilities management website, as well as archival research.


The following buildings are not listed in Table 3 because they are of recent construction and are not proposed for alteration or demolition as part of the proposed project:

- Building 200, College Center/Food Services

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

- Building 400, South Science Building
- Building 800, Library–Learning Resource Center
- Building 900, Auto/Machining/Printing
- Building 1400, Classroom Office Building
- Building 1900, Classrooms and Food Bank
- Building 2100, Sculpture/3D Arts
- Building W3, Wilshire Continuing Education
- Chiller Plant

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Original Campus Master Plan Buildings (Vaughn, 1935–1942)</i>			
<b>100 Administration</b> 	1938	<p>Built as part of the original campus plan by Vaughn, the two-story Spanish Colonial Revival style building with Churrigueresque style elements is irregular in plan, with a square tower jutting upwards at the juncture between the main portion and the south-facing ell. The low-sloped side-gabled roof and hipped tower roof are covered in Mission-style half-barrel clay tiles. Each gable end sports a projection sheltering a small decorative niche with scalloped detailing along the arch intrados. The building is characterized by board-formed concrete on the exterior with Churrigueresque flourishes at the roofline, main entry doors, and second-floor-level French doors. There are multiple entry points, but the original main elevation faced south toward East Chapman Avenue. The original main elevation is obscured by a modern one-story, flat-roof addition with a variety of metal windows. The second story of the main elevation remains visible, and features a series of five large multi-lite metal-framed windows in arched openings. Windows on the original building are wood-framed and of varying shapes and styles.</p>	<p>1957 (Taylor): Addition to south elevation altered original L-shape building plan.</p> <p>1963 (Taylor): Interior reconfiguration, addition of wire glass to windows, and addition of aluminum and glass entry door to south elevation.</p> <p>1987 (tBP/Architecture Inc.): Interior reconfiguration, updates to electrical plans, and updates to interior finishes.</p> <p>2000 (Hill): Seismic upgrades</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2003 (Swanye): Fire Alarm System Upgrade</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>300 Business and Computer Information</b></p> 	1936	<p>Built as the first building in Vaughn's campus plan, this two-story Spanish Colonial Revival building with Churrigueresque style elements is rectangular in plan and features a low-sloped side-gabled roof clad in Mission-style half-barrel clay tiles. A large octagonal cupola straddles the ridgeline near the center of the roof, with an arch sheltering a bell at the southern gable end and dentil moulding lining the cornice. The main elevation faces east toward the center of campus, with the recessed main entrance having double wooden doors topped by a lunette window. The main entry is emphasized by the use of Churrigueresque design elements, including a stilted arch with fluting above the impost line, three horseshoe-arch windows with elaborate metalwork at the second floor, and a scallop-capped niche flanked by pilasters on a decorative parapet rising from the cornice line. Secondary entry points on each remaining elevation are similarly detailed, but are less elaborate and at a reduced scale. The building was constructed of poured-in-place board-formed concrete, featuring a projecting molded string course capped by a row of stretcher bricks. Fenestration is regular, with two-by-two inoperable casement windows directly above two-by-two operable casement windows presenting as a single window unit. Near either end of the main elevation is a French door, located midway between floors, opening onto a shallow, elliptically-arched concrete bracket and protected by elliptically-arched decorative ironwork. Exterior staircases on either end of the building grant access to the second floor.</p>	<p>1962 (Taylor): Interior alterations, plumbing and mechanical system upgrades.</p> <p>1980 (Blurock): Interior plan reconfigurations; update of finishes; electrical, plumbing and mechanical system upgrades; replacement of plaster ceiling with reflective ceiling.</p> <p>2003 (Swanye): Fire Alarm System Upgrade.</p> <p>2005 (McMurray): Changes to stairs on north elevation.</p> <p>Date Unknown: Addition of a free-standing exterior elevator on the north elevation.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR



**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>600 Math</b></p> 	1938	<p>The two-story Spanish Colonial Revival building with Churrigueresque style elements is rectangular in plan and features a low-sloped side-gabled roof clad in Mission-style half-barrel clay tiles. A large octagonal cupola straddles the ridgeline near the center of the roof, with two front vertical protrusions at each gable end and dentil moulding lining the cornice. The main elevation faces west toward the center of campus, with the recessed main entrance having a single, wide wooden door beside a hinged partial-width section, topped by a lunette window. The main entry is emphasized by the use of Churrigueresque design elements, including a stilted arch with decorative voussoirs above the impost line and flanked by quoins, three subtly-pointed equilateral-arch windows at the second floor, and a niche flanked by grooved pilasters on a decorative stepped parapet rising from the cornice line. Secondary entry points on each remaining elevation are similarly detailed, but are less elaborate and at a reduced scale. The building was constructed of poured-in-place board-formed concrete, featuring a projecting molded string course capped by a row of stretcher bricks. Fenestration is regular, with two-by-two inoperable casement windows directly above two-by-two operable casement windows presenting as a single window unit. Near either end of the main elevation is a French door, located midway between floors, opening onto a shallow, elliptically-arched concrete bracket and protected by elliptically-arched decorative ironwork. Exterior staircases on either end of the building grant access to the second floor.</p>	<p>1980 (Blurock): Addition of bridge to the south elevation, which was likely removed when the South Science building was demolished.</p> <p>1985 (Blurock): Interior changes included mechanical, plumbing, and electrical, as well as changes to interior finishes.</p> <p>2003 (Swayne): Fire alarm system upgrade.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p> <p>Date Unknown: Addition of free-standing external elevator to the north elevation.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR



**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>401 Biological Greenhouse</b> 	c. 1937	The one-story rectangular greenhouse building features a front-gabled glass-and-metal roof. The concrete foundation supports the exterior walls. The lower two feet of the walls are running-bond brick courses, with the upper portion of the walls framed with steel I-beams and infilled with metal-framed lites, some of which open for ventilation and sunlight. A single metal door pierces the east elevation near the northern end. A fenced-in area is located to the east of the building.	Date Unknown: Glass wall lites painted.
<b>840 Campus Services</b> 	1940	A more restrained version of the style observed elsewhere on campus, this one-story Spanish Colonial Revival style building features multiple wings clad with stucco and low-sloped side-gabled roofs covered in Mission-style half-barrel clay tiles. The rectangular west wing was the first section of the building constructed, with the second comprising the rectangular north wing, oriented perpendicular to the first section and joined onto its north elevation to form an L-shaped plan. The west wing, constructed in 1941, created the U-shaped building plan present today. Fenestration consists of single- and double doors, some wood and others metal, typically with one or two lites, and multi-lite metal-framed windows in various sizes, some of which have operable sections within fixed sections. A concrete courtyard fills the area bounded by the U-shaped building on the south side, providing seating area for the café in the west wing	<p>1941 (Vaughn): Hornet Hive building addition created U-shaped plan.</p> <p>1959 (Taylor): Hive Snack Shop added to the patio area.</p> <p>2011: Hive Snack Shop remodeled and renamed Stinger.</p> <p>Date Unknown: Handicap ramps, addition to rear of building; replacement and/or resizing of original doors; addition of security bars on some windows.</p> <p>Date Unknown: Restrooms upgraded.</p> <p>Date Unknown: HVAC units.</p>




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1600-1691 Horticulture Center</b> 	c. 1946; relocated to current location 1961	One of the original T-buildings moved onto campus, this one-story building has a low-sloped side-gabled roof coved in composition shingles. The walls are clad in horizontal drop-lap wood siding, and the south-facing main elevation has a central entry point accessed by a set of broad, open, wood replacement stairs. Fenestration is regular, with eight-over-eight wood-framed double-hung windows. The building is one of many in the horticulture section of campus, including various greenhouses and growing buildings, as well as a single-story brick bathroom building.	Dates Unknown: HVAC units, porch construction with railing, handicap ramp to main entry door.
<i>Taylor and Conner's Campus Master Plan (1953–1967)</i>			
<b>500 Applied Arts and Humanities</b> 	1962	The International-style building is rectangular in plan and clad in painted stucco with a flat roof covered in rolled roofing material. The main elevation faces east, and features the recessed main point of entry under a cantilevered flat roof awning. Fenestration is regular with metal-framed windows placed singly or in pairs separated by a narrow mullion. The windows are of various shapes and sizes, but the majority typically have three or four horizontal lites, with the upper lites fixed and the bottom lite being an operable hopper window. The broad expanses of stucco are generally smooth, with subtle vertical grooves accenting the spaces above and below the windows.	1980 (Blurock): addition of free-standing external elevator to the north elevation, interior reconfigurations, and mechanical system upgrades.  2000 (Hill): Seismic upgrades.  2005 (McMurray): Changes to stairs on south elevation.  2006 (Asuncion): Chiller plant upgrade.  Date Unknown: Windows on the north portion of the west elevation at ground floor level were painted over.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>700 Technology and Engineering</b> 	1959	<p>The two-story reinforced concrete building is irregular in plan and features a flat roof with raised parapet. The main (south) elevation features a variety of multi-paned metal windows; a recessed entry point left (west) of center; the addition of an elevator on the east side of the elevation; installation of exterior insulation and finish system (EIFS) panels featuring stucco textures reminiscent of the original board-formed concrete buildings; and Spanish Colonial/Mission Revival style detailing that is not original to the building. A series of openings with segmental arches and applied ornament details dominate the elevation.</p>	<p>1964 (Taylor): Interior reconfigurations, mechanical system upgrades.</p> <p>1968 (Taylor/Blurock): Building addition, interior reconfigurations.</p> <p>1980 (Blurock): Addition of elevator and concrete walk to south elevation.</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2003 (Swanye): Fire alarm system upgrades.</p> <p>2012: Interior reconfigurations.</p> <p>2012 (RND): Guardrail and stair installation.</p> <p>Date Unknown: Modern EIFS with board-formed stucco texture.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>3000 Berkeley Center</b> 	1960	<p>The two-story Mid-Century Modern-style educational building is L-shaped in plan. The main (southwest) elevation has an uneven roofline and two sections projecting forward from the main building. The main elevation is clad with broad expanses of alternating brick and stucco; windows are set flush with the stucco cladding between the brick portions. The rest of the building is clad in stucco. The primary front entrance is recessed beneath decorative metal grilles that extend out from the exterior wall and are supported by metal posts. Fixed, floor-to-ceiling multi-pane windows are located next to the front entrance and are partially obscured by the metal grilles. There is a second entrance recessed into the brick wall with a metal door accessed by a set of concrete steps. The southwest corner of the building contains two fixed multi-pane windows on the first story and two louvered windows on the second story set flush into vertical bands of textured stucco.</p>	<p>1982 (Blurock): Interior reconfigurations, mechanical system upgrades, elevator added.</p> <p>2000 (Hill): Seismic upgrades.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1000 Fine Arts/Art Gallery</b> 	1959	<p>The two-story Mid-Century Modern building is irregular in plan with a flat roof and is clad in stucco. One-story partial-length projections clad in running-bond brick occur on the main (south), east, and north elevations. Fenestration is regular on the main elevation and features paired metal-framed windows, separated by structural mullions, with four horizontal lites; the second lite operates as an awning window, and the fourth lite operates as a hopper window. Other windows on the building are metal-framed with one or two lites. A replacement window punctuates the brick projection on the main elevation. The main entry is recessed with a newer wide metal and glass entry door and a narrow sidelite to the left (west), surrounded by wider sidelites and topped by a fixed, three-lite transom window. Access is provided by a handicap ramp leading to a poured concrete stoop.</p>	<p>1976 (Blurock): Interior reconfigurations, addition of external elevator and construction of brick walls and patio area to east elevation area.</p> <p>1981: Wheelchair ramp added.</p> <p>2001 (Asuncion): HVAC system upgrades.</p> <p>2002 (McMurray): Seismic work, new interior finishes, mechanical system upgrades, new handicap ramp, interior reconfigurations, finish replacements, fireproofing.</p> <p>2009 (Runge): Reroofed.</p>


# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1100 Music</b> 	1967	<p>This New Formalism-style building is clad in stucco and is irregular in plan with block-like massing and a flat roof. The main elevation faces south towards East Chapman Avenue, and presents as two sections: the western section with slender, attenuated columns supporting minimalist arches, four of which are infilled with smooth, monolithic stucco panels and the fifth, just west of center, is open and leads to the recessed main entrance; and the eastern section, which is recessed and contains with smooth, monolithic concrete panels sparsely punctuated by pairs of small metal-framed windows and displaying large ornamental screen grilles. The remaining elevations contain portions of running-bond brickwork at the ground floor while the rest is clad in smooth, monolithic stucco. Fenestration on the remaining elevations consists of metal-framed windows of various sizes, some fixed and others operable, as well as secondary entrances. An external staircase on the east elevation references the external staircases observed on the original campus buildings.</p>	<p>2003 (Swanye): Fire alarm system upgrade.</p> <p>2008 (Asuncion): Chilled water distribution modifications.</p> <p>Date unknown: Second-floor-level walkway from the Administration Building connecting to the east elevation, and a free-standing external elevator attached to the east elevation south of the walkway.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**


Current Building Number and Name	Built	Description	Identified Alterations
<b>1200 Physical Education</b> 	1955	<p>The Mid-Century Modern two-story building presents with block-like massing, thanks in part to building additions during Taylor's tenure as campus architect. The main body of the building is clad in stucco, with one-story projections constructed of brick in a running bond pattern and wrapped with a flush band of stucco near or at the roofline. The building is irregular in plan and features multiple levels of flat roofs. The fenestration for the building is irregular. Metal-framed multi-lite clerestory windows adorn the main body of the building, while the one-story projections contain a variety of metal-framed windows of different styles and arrangements. Of note is the placement of multi-lite windows in the top half to one-third of exterior walls on some of the one-story projections, subtly referencing the clerestory windows of the main section.</p>	<p>1956 (Taylor): One-story brick addition for health center.</p> <p>1957 (Taylor): Additions to men's and women's locker rooms.</p> <p>1962 (Taylor): Addition to south and northwest sections of the buildings, interior reconfiguration, construction of flat-roof covered walkway and butterfly-style covered walkway.</p> <p>1979 (Blurock): Interior reconfigurations, HVAC upgrades, plumbing upgrades, updates to finishes.</p> <p>1982: Reroofed.</p> <p>1999: Interior reconfiguration, mechanical systems upgrades, site work, removal of skylights, and fixture replacement.</p> <p>2000 (Hill): Seismic upgrades.</p> <p>2001 (Smith/tBP): Women's Locker Room HVAC work, interior renovations and demolitions, new exterior doors.</p> <p>2003 (Swanye): Fire alarm system upgrade.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
			<p>2008 (Amicay): Fire alarm system upgrades.</p> <p>2008 (Lambert): Construction of swimming pool, single-story 24-foot by 72-foot equipment building and handicap-accessible restroom upgrades.</p>
<p><b>1300 Theatre Arts</b></p> 	1967	<p>The two-story Mid-Century Modern building is irregular in plan with block-like massing. The main elevation faces east towards the center of campus. The majority of the building is clad in smooth, monolithic stucco, with sections of running-bond brickwork at the ground floor. Fenestration is minimal and irregular, typically consisting of metal-framed windows with a large fixed lite over a horizontal hopper-window lite. Exterior staircases are located on the south and main elevations..</p>	<p>2003 (Swanye): Fire alarm system upgrade.</p> <p>2008: Upgrades to fire system.</p> <p>Date Unknown: Addition of a free-standing external elevator to the south elevation.</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Chapman and Wilshire School Acquisition and Annexation (Kirby, 1980–1984)</i>			
<b>2100 Wilshire Theatre</b> 	1936	<p>This two-story PWA/WPA Moderne-style school auditorium is a modest example of the style. The building is largely rectangular in plan, is clad in stucco, and has a flat roof. The main (west) elevation features a centered trio of recessed three-panel wood double-doors, each topped by 12-lite transom windows. The doorways are flanked by fluted pilasters, with a recessed three-by-three wood-framed casement window to either side of the door grouping. The casement window to the right (south) serves as the ticket window. Additional secondary entrances, along with recessed three-by-three wood-framed casement windows located near the second-floor level, exist on the north and south elevations.</p>	<p>1982 (Blurock): New interior and exterior finishes, window replacements and additions, interior reconfigurations, updates to electrical plan and fixtures.</p> <p>2008: Interior renovations, upgraded finishes, electrical upgrades.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p> <p>2009 (Runge): Reroofed.</p>




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>W1 Building 100</b> 	1936	<p>This one-story PWA/WPA Moderne-style school classroom building is a modest example of the style. The rectangular building is clad in stucco and features a raised parapet surrounding a flat roof. The main (south) elevation features a centered, recessed wood double-door, with each leaf having six lites over two panels. There appears to be an infilled transom window above the doors. The entrance is flanked by fluted pilasters, with a pair of 12-lite windows, separated by a structural mullion, to either side. Two decorative stucco bands and two subtle stepped roofline bands ring the building. Fenestration on the other elevations is regular, and consists of either a single pair or a group of two 12-lite windows separated by structural mullions with fluted pilasters to either side of the groupings; some windows appear to be filled in. Porte cochères located on the west and north elevations connect to the Wilshire Theatre and Building 200 .</p>	<p>1970: Installation of AC system.</p> <p>1982 (Blurock): Replacement of windows, repair and repaint of interior and exterior finishes, installation of new aluminum sunscreen to east elevation, HVAC system upgrades.</p> <p>2007 (Runge): Window replacements, mechanical system upgrades, interior reconfiguration, repainting, site work.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p>



# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<p><b>W2 Building 200</b></p> 	1936	<p>Similar to W1 Building 100, this one-story PWA/WPA Moderne-style school classroom building is a modest example of the style. The rectangular building is clad in stucco and features a raised parapet surrounding a flat roof. The main (east) elevation features a centered, recessed wood double-door, with each leaf having six lites over two panels, and topped by a 12-lite transom window. The entrance is flanked by fluted pilasters, with a pair of 8-lite windows, separated by a structural mullion, to either side; the windows appear shorter than the typical 12-lite windows and the door appears raised to the level of the newer concrete entry stoop (likely to improve ADA access). Two decorative stucco bands and two subtle stepped roofline bands ring the building. Fenestration on the other elevations is regular, and consists of a group of three 12-lite windows separated by structural mullions with fluted pilasters to either side of the groupings.</p>	<p>1982 (Blurock): Replacement of windows, repair and repaint of interior and exterior finishes, installation of new aluminum sunscreens on east west elevations, HVAC system upgrades.</p> <p>2007 (Runge): Window replacements, mechanical system upgrades, interior reconfiguration, repainting, changes to handicap ramp, site work, and parking lot work.</p> <p>2008 (Asuncion): Chilled water distribution system modifications.</p>




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>Chapman Avenue Residential Acquisitions 1980s and 1990s</i>			
<b>428 East Chapman Avenue Buildings 1 and 2 (400 N. Newell Place)</b> 	Building 1:c. 1920 Building 2:c. 1940	<p>APN 033-072-01 consists of a single-family residence (Building 1) and a multi-family residence (Building 2) that are currently owned and used by FCC. Building 1 is a one-story single-family residence with an irregular plan set on a concrete foundation, and has a hipped roof clad with composite shingles. The house was constructed in the Craftsman style around 1920.</p> <p>The multi-family residence on the property that we will refer to as Building 2 is a duplex designed in the Minimal Traditional style and is oriented toward Newell Street.</p>	None identified.
<b>434 East Chapman Avenue</b> 	1922	<p>APN 033-072-02 features a single-family residence constructed in the Craftsman style in 1922. The one-story, front-gabled home has a composite shingle roof and is clad with horizontal wood siding and set on a poured concrete foundation. The building is rectangular in plan, with a prominent front porch oriented to Chapman Avenue. The parcel also contains a small, one-story garage building.</p>	None identified.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR




**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>438 East Chapman Avenue</b> 	1921	APN 033-072-03 features a one-story single-family residence that is oriented toward Chapman Avenue that was originally constructed in 1921 in the Craftsman style and was remodeled in 1949 to its present Minimal Traditional appearance. The residence is irregular in plan, set on a poured concrete foundation, with a complex roof clad in composite shingles, and is clad in horizontal wooden siding.	Remodeled to Minimal Traditional style in 1949.
<b>325–327 North Newell Place</b> 	c. 1921–1924	The one-story Bungalow style duplex is clad in horizontal wood siding, features a gabled roof, and is square in plan. The façade of the building features mirrored entry points with wooden doors and three-section, fixed Craftsman style windows, all under a gabled porch with brick-and-wood columns. The other elevations have irregular fenestration and feature a variety of sizes, but maintain a one-over-one configuration.	None identified.
<b>409 North Newell Place</b> 	c. 1958–1960	This modern two-story multi-family apartment building is rectangular in plan and clad in stucco, with a low pitched roof with exposed rafter tails. The first floor features three bays with double-wide sectional garage doors, and the second floor features a wooden balcony providing access to three living spaces. Entry to the building is provided by an exterior staircase located on the north elevation. There are a variety of windows throughout, including jalousie windows on the north and west elevations. The west elevation also features a single entry door centered on the elevation that provides access to the first story of the building.	None identified.





# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>420 East Chapman Avenue</b> 	c. 1920	The one-story gabled Bungalow features an offset to the east front gabled porch supported by brick-and-wood columns, which features a Craftsman style fixed three-section window and an entry door. The house is clad in horizontal wood siding and sheathed in composition shingles, and the roof features exposed rafter tails. The remaining windows are single-hung, fixed wood windows in a variety of sizes.	None identified.
<b>416 East Chapman Avenue</b> 	c. 1936	The one-story gabled Minimal Traditional duplex is clad in stucco, is rectangular in plan, and is sheathed in composition shingles. The façade of the building features an offset to the east gabled entry point that provides two entry points to the duplex. There is also a bay window and a 12-paned wood window on the façade of the building.	None identified.
<b>418 East Chapman Avenue</b> 	c. 1958	The one-story tract house duplex is clad in stucco features a low pitched roof sheathed in composition shingles and is set on a poured concrete foundation. The building features irregular fenestration with a central entry point. Windows appear to be vinyl replacement windows in varying sizes and arrangements. The building is largely obscured from view by a tall wooden fence.	Date Unknown: Replacement windows, screen door, and construction of fence.




# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<i>William E. Blurock's Campus Expansion Plan (1965–1984)</i>			
<b>2200 Micro Computer Lab</b> 	1973	The one-story relocatable modern building with a low pitched roof sits on a poured concrete foundation and features two entry points on the east elevation under a cantilevered canopy. The building is rectangular in plan. The entry is accessed by concrete ramp with metal handrails. Fenestration is irregular and there is little exterior ornamentation.	None identified.
<b>2300 Media Services/Academic Computer/M&amp;O Shops</b> 	c. 1970	The one-story relocatable modern building is rectangular in plan, is clad in stucco, and features a low pitched shed roof. The building has paved parking areas on the north, east, and south elevations. The main points of entry for the building are located on the north elevation. There are multiple points of entry with two sets of double metal doors and five sets of single metal doors with sidelights. The north elevation also features two sets of fixed metal windows offset to the west.	None identified.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR


**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
<b>1800 Child Development Building</b> 	c. 1980	The one-story Modern style classroom building complex consists of three one-story buildings that were connected and arranged in an L shape around an open courtyard to the south. The two buildings, which feature low pitched roofs, were known as relocatable buildings to the campus and the clay-roof-tiled building that creates the "L" in the plan was newly constructed after the two relocatable buildings were moved to the location. The buildings are clad in stucco, with some sections of vertical wooden siding, and feature a complex roofline with clay tiles. Fenestration is irregular and includes metal-frame windows in varying sizes on all elevations. There is also a chain-link fence on the south elevation that provided security for the courtyard area, which was a play area for children.	None identified.
<b>2000 Student Services Building</b> 	1984	The two-story Modern style building is clad in stucco with a flat roof. It is irregular in plan and features irregular fenestration with fixed metal windows of varying sizes. The main point of entry for the building is located on the east elevation. The building connects to a pedestrian bridge that connects it to the rest of the campus on the north side of Chapman Avenue.	2008: Reroofed.
<b>Pedestrian Bridge</b> 	1984	The pedestrian bridge provides north-south access across Chapman Avenue. It is of Modern style construction and is supported by arched concrete supports on the north and south ends. The bridge is connected to the Student Services building to the south and the Administration building to the north.	None identified.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 3**  
**Fullerton College Campus Buildings and Structures Surveyed**

Current Building Number and Name	Built	Description	Identified Alterations
Building 3100, Academic Technology 	1976	The one-story Modern building is irregular in plan and sits on a poured concrete foundation. The building features a built-up flat roof and was designed by Blurock.	2008: Interior renovations, upgrades to telecommunications and electrical systems.



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## 5 SIGNIFICANCE EVALUATIONS

Extensive archival research, combined with an intensive pedestrian survey of the Fullerton College grounds, indicates the campus has three potential historic districts (Figure 31): the Fullerton Junior College Campus Historic District, the Mid-Century Modern Campus Expansion Historic District, and the Wilshire Junior High School Historic District. Furthermore, the Music Building 1100 was identified as being potentially eligible for individual listing at the local level. The significance evaluations for each of the proposed historic districts and the individual property are detailed below.

### 5.1 Fullerton Junior College Campus Historic District

After purchase of the college grounds in 1934, Vaughn laid out a master plan for the new 16-acre FJC Campus. Assisted by landscape architect Ralph Cornell, Vaughn created a plan that called for 12 buildings symmetrically organized around a formal central courtyard area, similar to the arrangement of Jefferson's University of Virginia. Vaughn designed the buildings in the Spanish Colonial Revival style with Churrigueresque style influences, an architectural style synonymous with Southern California. The FJC received a great deal of WPA and PWA funding for executing the campus plan. The WPA also provided Vaughn and FJC with funding for the construction of a greenhouse and for landscaping. With this funding, the Horticulture students of FJC were able to grow plants to place throughout the campus accenting Vaughn's plan. Although the master plan originally called for 12 buildings, only 5 were constructed: the Commerce building, Administration building, Technical Trades building, Student Union building, and Greenhouse Building (FHN 2010; Epting 2014). Each of those 5 buildings still exists and continues to serve a vital role on campus. Furthermore, the City of Fullerton identifies the FJC Campus as a "Significant Property" in their publication *Fullerton Through the Years: A Survey of Architectural, Cultural, and Environmental Heritage* (DSD 2002) and in Section 5.10, Cultural Resources, of *The Fullerton Plan: Final Program EIR* (City of Fullerton 2012b).

The boundary of this potential historic district includes the historic core of the FJC Campus, and consists of the original five buildings and remnants of the formal campus plan, such as the open courtyard, linear pathways, and building locations and orientations. There are also non-contributing elements (i.e., they do not contribute to the historic district's significance) within the historic boundaries of the campus, namely more modern buildings, but they were constructed on areas of ground originally apportioned for buildings in Vaughn's master plan. Table 4 provides a complete list of all potential contributing and non-contributing components. Figure 32 shows the location of all contributing buildings. The period of significance for the district is 1935–1942, when Vaughn completed the original campus master plan.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 4**  
**Inventory of Buildings within the Potential**  
**Fullerton Junior College Campus Historic District**

Component	Year Built	Historic District Status
Landscape Design Components	c. 1935–1942	Contributor
Commerce (Bldg. 300)	1936	Contributor
Greenhouse (Bldg. 401)	c. 1937	Contributor
Technical Trades (Bldg. 600)	1938	Contributor
Administration and Social Sciences (Bldg. 100)	1938	Contributor
Student Union (Bldg. 840)	1940	Contributor
College Center (Bldg. 200)	1969	Non-contributor
South Science (Bldg. 400)	1969	Non-contributor
Applied Arts/Humanities (Bldg. 500)	1969	Non-contributor
Library (Bldg. 800)	1969–1976	Non-contributor

### Character Defining Features

The character-defining features of the Fullerton Junior College Campus Historic District include the following exterior features:

- Low pitched side-gabled roofs with half-barrel clay Mission tiles
- Painted, board-formed concrete walls
- Simple rectangular or L-shaped plans
- Exterior stairways on gable ends
- Symmetrical fenestration
- Prominent arches above entryways
- Heavy, multiple-panel wood doors
- Low relief oriels with typically semi-circular balconies below slightly recessed windows
- Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes
- Elaborate ground-floor entrances with recessed doorways, surmounted by decorative plaques
- Extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings



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The character-defining features of the Fullerton Junior College Campus Historic District also include the following interior features (as observed in the 100, 300, and 600 buildings):

- Recessed doorways
- Wood doors with stacked panels
- Decorative iron work (including stair railings; light fixtures in buildings 100 and 300)
- Barrel vault ceilings
- Brass door hardware

### **5.1.1 NRHP/CRHR Evaluation Criteria**

The buildings and campus components within the proposed Fullerton Junior College Campus Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met for a property to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

***Criterion A/I: Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.***

FJC was established in 1913 and opened in September of that year, making it the longest continually operating junior college in California. The founding and growth of FJC occurred at the same time as the City of Fullerton and the surrounding area experienced rapid growth due to the oil boom, which peaked during the 1920s. Classes were originally held at Fullerton Union High School, until 16 acres of land were bought across the road from the high school in 1934. The Board of Trustees hired Vaughn to design and oversee planning and development of the FJC Campus from 1935 to 1942. Vaughn operated as the FJC Campus architect with the assistance of WPA funds, designing and supervising construction of numerous buildings on the campus until 1942.

With 4-year university enrollments on the decline due to financial instability, FJC provided an affordable option for the students of Fullerton and the surrounding communities, eventually reaching an enrollment of 1,500 by September 1939. A rapid decline in enrollment followed, as many potential students were drafted or volunteered for the military. FJC persevered through the war, implementing new programs to support the war effort by training workers for defense industry jobs. Other activities on campus further supported the war effort, such as letter writing



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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and making clothing for the troops. FJC continued serving the military after the war effort by adding temporary buildings and veterans' housing to accommodate the massive influx of WWII veterans using the G. I. Bill.

FJC has a rich history of assisting with the war effort by providing training and education, both during WWII and after the war, as veterans returned to civilian life. Furthermore, the original FJC Campus forms the core of California's longest continuously operating junior college. Therefore, the Fullerton Junior College Campus Historic District appears eligible for listing as a historic district under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Although numerous persons are historically associated with FJC, archival and background research failed to indicate any associations with persons important in history during 1934–1942. Therefore, the Fullerton Junior College Campus Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

The buildings constructed as part of the original FJC Campus design plan embody the distinctive design characteristics of Spanish Colonial Revival, a modern architectural style that dates from 1915 to 1940 and became synonymous with Southern California architecture. During this period, Spanish Colonial Revival was a popular style of architecture on college campuses in California, particularly in the south.

The campus buildings from the 1930s and 1940s are most strongly characterized by their simple rectangular and L-shaped plans; symmetrical fenestration; barrel-shaped Mission tiles cladding low-sloped, side-gabled roofs; prominent arches above entrance doors; exterior stairways on the gable ends; and use of concrete as the dominant material type. The buildings are unified aesthetically by a number of character-defining features, including painted, board-formed concrete walls; heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings.

The FJC campus was designed by an important creative individual, Harry K. Vaughn, and represents the peak of Vaughn's career (1930s–1940s) when he completed his most important—possibly his

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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only—designs as an independent architect, including the Spanish Colonial Revival style Fullerton Public Library. Prior to that time, Vaughn worked under such notable architects as Irving Gill, William Hebbard, Carleton Winslow, and Octavius Morgan, and afterward he went on to work for the California Department of Public Works, Division of Architecture. During Vaughn's time with Hebbard, he prepared working drawings for the historic Craftsman style Marston House in San Diego. Afterwards, while working for Winslow, Vaughn prepared the working drawings for buildings associated with the 1915–1916 Panama–California International Exposition, including the Administration building. The Exposition buildings (now Balboa Park National Historic Landmark) were seminal in making the Spanish Colonial Revival style synonymous with Southern California; this was Vaughn's first known exposure to the Spanish Colonial Revival architectural style.

Although the 1930s and 1940s buildings are unified by their Spanish Colonial Revival style and shared character-defining features, and they remain functionally related buildings, the original landscape design of the campus master plan has been altered over time (as seen in historic aerials c. 1953–1963, c. 2004, and after 2012 (NETR Online 2017)). The front of campus, facing onto East Chapman Avenue, was originally a broad expanse of flat lawn with ornamental, curvilinear plantings near the Administrative building and the anticipated footprint of another L-shaped building in the southeastern corner; a wide, north–south oriented pathway separated the two buildings and formed the grand entrance into the heart of the original campus. Between 1953 and 1963, modern additions to the two buildings infilled approximately half of the open lawn, eliminating the curvilinear planting beds, and several ancillary paved pathways further segmented the lawns. A distinctive and prominent feature of the original campus was the arrangement of the central courtyard into *parterres* (i.e., flat gardens arranged in a formal design), delineated by a grid of walkways. The grid of north–south and east–west oriented walkways served a functional use, facilitating movement within and around campus. The symmetry of the strict spatial organization created by the grid, and positioning of the library at the northern end, opposite the main entrance to campus, symbolized the power and success imparted by knowledge and learning. The expansion of the library in 2004 resulted in foreshortening the length of the original courtyard space and introduced a curved element in the shape of the hardscaping fronting the library. Additionally, at some point after 2012, the original pattern of the courtyard *parterres* was altered by removing the existing two north–south pathways and replacing them with one central north–south pathway leading directly from the main campus entrance to the library's door, and by introducing more circular hardscaped areas at the site of formerly orthogonal intersections.

Other compromised historic materials and details include the building interiors, particularly on the second floor, with the interior of the Campus Services Building 840 being fully compromised; the expansion of two newer buildings slightly beyond the bounds of the original

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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campus footprint; and a 1957 Modern style addition to the front of the Administration Building 100. However, the essential physical features that constitute the Fullerton Junior College Campus Historic District's Spanish Colonial Revival architectural style remain largely intact. Although new buildings were added to the campus, and removal of portions of the landscape design altered the flow of the original FJC Campus design, the historic-age buildings are still united aesthetically by their Spanish Colonial Revival style and functionally by their history as the original 1930s–1940s FJC Campus buildings.

Despite alterations to the original FJC Campus design plan and the addition of new buildings in recent years, the original 1930s and 1940s Spanish Colonial Revival buildings and the master plan landscape design still convey most of the major character-defining features of their style and design, and represent the notable work of a master architect. Therefore, the buildings appear eligible for listing as contributors to a historic district under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, Fullerton Junior College Campus Historic District does not appear eligible for listing under Criterion D/4.

### **5.1.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Fullerton Junior College Campus Historic District appears eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** The Fullerton Junior College Campus Historic District appears eligible for listing for being the original buildings and campus master plan of FJC. The original FJC Campus forms the core of California's longest continuously operating junior college.
5. ***Exemplification of the best remaining architectural types in an area.*** The historic district represents a group of exceptional examples of Spanish Colonial Revival architecture and the landscape design of the original campus master plan.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** The buildings in the historic district are rare examples of Harry K. Vaughn's work as a solo architect, who had an esteemed career working for such esteemed California architects as Irving Gill, William Hebbard, Carleton Winslow, and Octavius Morgan. It was his time working on the

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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1915–1916 Panama–California Exposition buildings with Winslow that inspired Vaughn’s designs for the Fullerton Junior College campus.

7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The historic district appears eligible for listing for the outstanding attention to detail evident in the buildings’ heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The historic district’s buildings and campus master plan present a group of buildings designed in the Spanish Colonial Revival style, of which the preservation of each of the five buildings and landscape design components are necessary to maintain their integrity and recognition as a historic district.

### 5.1.3 Integrity Considerations

Integrity is the authenticity of a historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.1.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

**Location:** The Fullerton Junior College Campus permanent buildings have always occupied the same location. While various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the Fullerton Junior College Campus Historic District retains integrity of location.

**Design:** For historic districts, design includes more than the integrity of the individual buildings. It also includes the way in which buildings within the district are related and connected. Overall, contributing buildings within the historic district retain a preponderance of the major design elements and character-defining features of Spanish Colonial Revival architecture that aesthetically unify them on the exterior, including their simple rectangular and L-shaped plans; symmetrical fenestration; barrel-shaped Mission tiles cladding low-

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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sloped side-gabled roofs; prominent arches above entrance doors; exterior stairways on the gable ends; and use of concrete as the dominant material type. Major exterior alterations to the buildings include an addition to the west wing of the Campus Services Building 840, and replacement of some original iron guardrails.

Additionally, the majority of the building interiors were substantially altered as part of remodeling efforts, which in many cases included removal of character-defining features on the interior. The design aesthetics of Spanish Colonial Revival architecture extended into interior spaces. The ornate iron fixtures such as handrails and lighting components, heavy wood doors, and decorative flourishes are still evident in many of the buildings. However, the reconfiguration of interior spaces on any campus is a common occurrence in response to changes in enrollment capacity, education pedagogy, and building functionality.

Integrity of the original campus plan has been somewhat compromised by foreshortening the original courtyard space; removing the existing two north–south pathways and replacing them with one central north–south pathway; and introducing several circular hardscape features among the originally orthogonal intersections and pathways. The campus does, however, still retain the essence of its original plan as a symmetrical arrangement of buildings organized around a formalized central courtyard.

In consideration of integrity of design, the Fullerton Junior College Campus buildings appear to retain the requisite integrity of the Spanish Colonial Revival stylistic elements that unify them, and Fullerton College retains the integrity of the basic layout of the original campus plan. However, aspects of design integrity related to the original campus landscape design have been partially lost.

**Setting:** The area surrounding FJC has noticeably changed since the 1930s. Originally set in an area of Fullerton bordering agricultural land, the surrounding residential and commercial development expanded along with the campus during the district’s period of significance. Later additions to campus were built around the periphery of the original FJC master plan campus. One notable change to the campus setting in recent years is alterations to pathways of the original landscape design. Additionally, trees and greenspace once located at the front (southern end) of campus were largely replaced with the College Center Building 200, the Modern extension to the main (south) elevation of the Administration Building 100, and a pedestrian bridge across East Chapman Avenue. Although most portions of the campus retain their setting, others (e.g., the area fronting onto East Chapman Avenue) have been altered. Therefore, the Fullerton Junior College Campus Historic District retains partial integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, including painted, board-formed concrete walls; heavy, multiple-panel

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings. Although sections of the original landscape design were altered or removed, the remaining sections and repetitive nature of the materials historically used on campus still conveys the materials and intent of the original campus. Therefore, the Fullerton Junior College Campus Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the board-formed concrete that shapes the buildings, the purposeful use of similar yet noticeably different design flourishes, and in the striking Spanish Colonial Revival characteristics of the buildings and the sculptural qualities that they exude. Overall, the Fullerton Junior College Campus Historic District retains integrity of workmanship.

**Feeling:** The Fullerton Junior College Campus Historic District buildings and other contributing elements strongly express the Spanish Colonial Revival aesthetic. The buildings' simple rectangular and L-shaped plans and symmetrical fenestration, combined with the aesthetically unifying painted, board-formed concrete walls; heavy, multiple-panel wood doors; oriels with typically semi-circular balconies below slightly recessed windows; modest Churrigueresque flourishes at second-story doors, balconies, and gable-end apexes; elaborate ground-floor entrances with recessed doorways surmounted by decorative plaques; and extensive use of ornate, highly detailed iron work for grilles, handrails, and stair railings, immerses one in the Spanish Colonial Revival style. The Fullerton College Campus continues to evoke the spirit of Spanish Colonial Revival through its original 1930s and 1940s buildings, and therefore retains integrity of feeling.

**Association:** The Fullerton Junior College Campus Historic District is not associated with any important historic events or people.

### 5.1.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicates that the original 1930s–1940s FJC Campus appears to be eligible as a historic district under NRHP Criterion A/CRHR Criterion 1 and NRHP Criterion C/CRHR Criterion 3, as well as local criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district's period of significance (1935–1942).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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As a result of these findings, the Fullerton Junior College Campus Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6, Impacts Analysis.

### 5.2 Mid-Century Modern Campus Expansion Historic District

The buildings constructed during the late 1950s through the 1960s represent a significant community of buildings united aesthetically by their Modern architectural style. These buildings were developed as part of the mid-century expansion master plan for the campus, which was designed and executed by architect William Henry Taylor, of Taylor, Warren, Nishimoto and Conner. The Mid-Century Modern Campus Expansion Historic District period of significance is 1955–1967. This period begins with the early phases of campus expansion when FJC hired Taylor as their campus architect, and ends while the last buildings designed by Taylor were under construction and the role of campus architect transitioned to William E. Blurock.

The boundary of this potential historic district is discontinuous, forming three distinct clusters around the core of the original campus: the Music, Theatre Arts, and Applied Arts/Humanities buildings west of the core campus; the North Gym and Fine Arts/Art Gallery buildings east of the core campus; and the Berkeley Center at the northern bounds of campus. All pre-1955 and post-1967 buildings on campus are non-contributors. Table 5 provides a complete list of all potential contributing elements within the historic district. Figure 33 shows the location of all contributing buildings.

**Table 5**  
**Inventory of Buildings within the Potential**  
**Mid-Century Modern Campus Expansion Historic District**

Building Name and No.	Year Built	Historic District Status
<i>Science Building (N/A)</i>	1954	<i>Demolished in 2010</i>
Gymnasium Complex (1200)	1955–1962	Contributor
Art–Home Economics (1000)	1957	Contributor
<i>Library (N/A)</i>	1957	<i>Demolished in 2003</i>
Technical Education (700)	1959	Non-contributing; altered beyond recognition after 2007
District Administration Building (3000)	1960	Contributor
Applied Arts/Humanities (500)	1962	Contributor
Music (1100)	1967	Contributor
Theatre Arts (1300)	1967	Contributor

**Notes:** N/A = not applicable.

The Gymnasium Complex comprises three phases of construction: main building completed in 1955, followed by additions in c. 1957 and c. 1962. All phases were designed by William Henry Taylor.







**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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### Character Defining Features

The character-defining features of the Mid-Century Modern Campus Expansion Historic District include the following:

- Flat roofs without copings
- Broad, typically smooth, expanses of light-colored concrete walls
- Flush-mounted metal-framed windows arranged in linear groupings
- Cantilevered canopies and overhangs
- Exterior staircases, patios, and balconies
- A marked absence of decorative detailing around windows and doors
- Asymmetrical block-like building massing
- *Brise soleils* (particularly the Music Building 1100)
- Slender, attenuated columns supporting minimalist arches (Music Building 1100)
- Covered walkways with butterfly canopies (Gymnasium Complex)
- Brick privacy screens (Gymnasium Complex)
- Repetition of butterfly form in landscape bench seating

Of the nine buildings designed by Taylor, six remain largely unaltered, one has been altered beyond recognition, and two have been demolished to make room for newer buildings.

### 5.2.1 NRHP/CRHR Evaluation Criteria

The buildings and campus components within the proposed Mid-Century Modern Campus Expansion Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

**Criterion A/I:** *Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.*

As FJC was already well established, it does not appear that construction of the Mid-Century Modern buildings resulted in any significant contribution to patterns of development in the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Fullerton area. Further, no other events were identified as a result of archival and background research that would warrant consideration under this criteria. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Although numerous persons are historically associated with FJC during the Mid-Century Modern Campus Expansion period of significance, archival and background research failed to indicate any associations with persons important in history. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

The majority of buildings constructed as part of the Mid-Century Modern Campus Expansion embody the distinctive characteristics of the International style, an architectural style popular in the United States between the 1950s and 1970s in the United States, while one was designed in the New Formalism style, which is characterized by the adaptation of classical elements into an International style expression. The buildings were designed by the late William Henry Taylor (1912–1995), an important architect in the San Gabriel Valley for his interpretation of modernism (see Section 3.5.4). In 1953, FJC started its second expansion phase, which continued into the 1960s. The Pasadena architectural firm of Taylor, Warren, Nishimoto and Conner (later Taylor and Conner) was selected by the FJC trustees to develop a new master plan for the campus, with Taylor serving as the buildings' principal designer.

The Gymnasium Complex (Building 1200), Art–Home Economics building (Building 1000), District Administration building (Building 3000), Applied Arts/Humanities building (Building 500), and Theatre Arts building (Building 1300) were designed in the International style. Somewhat modest interpretations of that style, the buildings are characterized by flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. The shared design characteristics unify the discrete groupings of these modern buildings, making them instantly recognizable as a discontinuous but integrated whole.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The Music Building 1100 is a significant element of Taylor's modern campus design, exhibiting New Formalist design principles and anchoring the southwest corner of the campus. The 1962 Lincoln Center for the Performing Arts (New York) is one of the best-known examples of New Formalism in the United States, which is an adaptation of International style created to evoke a more symbolic, ceremonial feeling by translating classical elements into a modern aesthetic. Taylor emulated that design ethos in his design for the Music building by intentionally incorporating the defining characteristics of New Formalism: slender, attenuated columns supporting minimalist arches; smooth, monolithic concrete panels; ornamental screen grilles; and a flat slab roof, with the overall building massing presenting as block-like forms (McAlester 2015). The Music Building also represents one of the few examples of New Formalism in Fullerton. The only other known examples of the style in the city include Fullerton City Hall (1963) and the Western State University College of Law (1975).

Although not widely known, Taylor appears to have quietly played an important role in the local interpretation of modernism in Southern California during a time when architects like Neutra and Harris were making a name for themselves as among the most important modern architects in the country. Much of Taylor's mid-century modern work occurred in Pasadena and San Gabriel Valley, from which some of the most influential modern architects emerged. Taylor's modern designs at Fullerton College embody characteristics of the International style: flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. The buildings largely retain exterior physical integrity, with the exception of some minor alterations to the landscape and hardscape, including removal of the pool behind the gymnasium; the area now serves as a sand volleyball court. The Gymnasium Complex also had the skylights above the main and women's gymnasiums removed, with the resulting gaps roofed over and covered with rolled roofing material. The most notable exception to integrity is the Technical Education Building 700, a non-contributor to the district, which was altered beyond recognition after 2007. Regardless, the remaining Modern buildings retain their characteristics of International and New Formalist architectural styles and exemplify educational architecture during the mid-century. For these reasons, the Mid-Century Modern Campus Expansion Historic District appears eligible for listing under NRHP/CRHR Criterion C/3.

Additionally, the Music Building 1100 appears eligible for individual listing under NRHP/CRHR Criterion C/3 as an excellent local example of New Formalism, as evidenced by its slender, attenuated columns supporting minimalist arches; smooth, monolithic concrete panels; ornamental screen grilles; and a flat slab roof, with the overall building massing presenting as block-like forms.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion D/4:** *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor are they associated with any archaeological resources. Therefore, the Mid-Century Modern Campus Expansion Historic District does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.2.2 Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Mid-Century Modern Campus Expansion Historic District appears eligible for listing under the following criteria:

5. ***Exemplification of the best remaining architectural types in an area.*** The Mid-Century Modern Campus Expansion Historic District appears eligible for listing for being a rare grouping of exemplary International style educational buildings in Fullerton; and for the Music building being one of the few extant examples of New Formalism in Fullerton.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** The historic district appears eligible for listing for being the work of William Henry Taylor, an important Southern California modern architect.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The historic district appears eligible for listing for embodying the distinctive elements of the Mid-Century Modern style, as seen in educational architecture. In particular, the Music building incorporates outstanding attention to architectural design in the attenuated columns and geometrically patterned metal, *brise soleil* while still remaining visually connected to Taylor's other International style buildings on campus.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The Mid-Century Modern Campus Expansion Historic District buildings represent a group of buildings ringing the original FJC Campus grounds and designed in the International or New Formalism style, of which the preservation of each of the six remaining buildings is necessary to maintain their integrity and recognition as a historic district.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** The historic district appears eligible for listing for the Music building, which is prominently situated on the northeast corner of

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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East Chapman Avenue and North Lemon Street and as such is strongly associated with the first view people have of the Fullerton College campus.

### 5.2.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.2.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

**Location:** The Mid-Century Modern Campus Expansion buildings have always occupied the same location. Although various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the Mid-Century Modern Campus Expansion Historic District retains integrity of location.

**Design:** For historic districts, design concerns more than the integrity of the individual buildings. It also concerns the way in which buildings within the district are related and connected. Overall, contributing buildings within the Mid-Century Modern Campus Expansion Historic District retain a preponderance of the major design elements and character-defining features of the International and New Formalism styles that aesthetically unify them on the exterior, including their flat roofs without copings; broad, typically smooth, expanses of concrete walls; flush-mounted metal-framed windows arranged in linear groupings; a marked absence of decorative detailing around windows and doors; and asymmetrical block-like building massing. Exterior alterations to the buildings are minimal, and the addition of a free-standing elevator off the north end of the Applied Arts/Humanities building is consistent with the *Secretary of the Interior's Standards for Historic Preservation*. The one notable exception to this is the Technical Education Building 700, which was altered beyond recognition sometime after 2007.

In consideration of integrity of design, the Mid-Century Modern Campus Expansion Historic District buildings appear to retain requisite integrity of the International and New Formalist stylistic elements that unify them.

**Setting:** The area surrounding the Mid-Century Modern Campus Expansion Historic District buildings has not substantially changed since the late 1960s. Most of the residential and commercial development that surrounds the campus was already in place during the historic

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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district's period of significance. Therefore, the Mid-Century Modern Campus Expansion Historic District retains integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, including smooth concrete walls, metal-framed multi-paned windows, and light-toned painted surfaces. The repetitive nature of the materials historically used on campus ties the Mid-Century Modern buildings with the original campus buildings, while at the same time differentiating them based on finishing techniques. Therefore, the Mid-Century Modern Campus Expansion Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the concrete panels and columns that shape the buildings, the purposeful use of smooth and textured concrete finishes, and in the clean, linear, box-like massing of the buildings. Overall, the Mid-Century Modern Campus Expansion Historic District retains integrity of workmanship.

**Feeling:** The Mid-Century Modern Campus Expansion Historic District buildings and other contributing elements strongly express the International and New Formalism aesthetic. The graceful, elegant, unadorned forms, with the occasional artistic flourish of textured concrete or patterned metal screen grilles, evokes the zeitgeist of the modern era. The buildings form discrete pockets of modern elegance and simplicity, accentuating the more exuberant Spanish Colonial Revival buildings of the original campus; they share the feelings of excitement, innovation, and uniqueness, yet remain their own discrete parts of the campus. The Mid-Century Modern Campus Expansion Historic District exudes the spirit of modernism and therefore retains integrity of feeling.

**Association:** The Mid-Century Modern Campus Expansion Historic District is not associated with any important historic events or people.

### 5.2.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicate that the buildings designed by Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP Criterion C/CRHR Criterion 3, as well as local criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect William Henry Taylor.

Additionally, the Music Building 1100 appears eligible as both a district contributor and an individual property under NRHP Criterion C/CRHR Criterion 3, as well as local criteria 5, 6, 7,

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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8, and 9, for its high artistic value associated with the New Formalism style and its location prominently anchoring the southwest corner of campus.

As a result of these findings, the Mid-Century Modern Campus Expansion Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6.

### 5.3 Wilshire Junior High School Historic District

The 1936 buildings of the Wilshire Junior High School represent a significant grouping of buildings united aesthetically by their PWA/WPA Moderne architectural style, a style prominent in PWA/WPA buildings. Designed by architect Donald Beach Kirby, the auditorium and two classroom buildings were built of reinforced concrete; the two one-story classroom buildings and the two-story auditorium had flat roofs with low parapets. These buildings were developed to replace the original Wilshire School, which was damaged in the 1933 Long Beach Earthquake. The Wilshire Junior High School Historic District period of significance is 1936, for its association with the PWA/WPA program and being a fine example of the PWA/WPA Moderne style of buildings. Furthermore, the Wilshire Junior High School Auditorium and Classroom buildings are a listed City Landmark (Landmark number HL-12), and they are already considered historical resources under CEQA.

The boundary of this potential historic district includes the three existing campus buildings constructed in 1936, which serve as contributing elements to the district, and one c.1990 building, which is a non-contributor, built adjacent to the east elevation of the Auditorium. Table 6 provides a complete list of all potential contributing and non-contributing elements. Figure 34 shows the location of all contributing buildings.

**Table 6**  
**Inventory of Buildings within the Potential Wilshire Junior High School Historic District**

Building Name and No.	Year Built	Historic District Status
Wilshire Theatre	1936	Contributor
W1, Building 100	1936	Contributor
W2, Building 200	1936	Contributor
3D Sculpture Arts (Building 2100)	c. 1990	Non-contributing

#### Character Defining Features

The character-defining features of the Wilshire Junior High School Historic District include the following:



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Balanced and symmetrical forms based on Classical design principles
- Feeling of monumentality and authority
- Rectangular massing
- Windows arranged as vertical recessed panels
- Smooth concrete walls
- Fluted vertical ornamentation reading as modern versions of classical columns
- Subtle, unadorned, broad belt courses
- Parapets crowned with horizontal recessed bands

### **5.3.1 NRHP/CRHR Evaluation Criteria**

The buildings and campus components within the proposed Wilshire Junior High School Historic District were evaluated for listing at the local level of significance. The NRHP denotes four specific criteria for listing, of which at least one must be met to be considered potentially eligible for listing on the NRHP. The CRHR criteria were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP. As such, the NRHP and CRHR evaluations are presented concurrently. According to the NRHP and CRHR, a resource is considered historically significant if it (i) retains “substantial integrity,” and (ii) meets at least one of the following criteria:

***Criterion A/1: Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.***

The Wilshire Junior High School buildings were funded by monies from the PWA/WPA during the Depression. The PWA/WPA relief program had an exceptional impact on the local economy, making possible the construction of several governmental and educational buildings during the Depression years. Other PWA/WPA buildings in Fullerton include portions of the original Fullerton Community College campus, the main public library (now Fullerton Museum Center), the city hall (now the Fullerton Police Department), the main post office, and the Fullerton Union High School. The three Wilshire Junior High School Historic District buildings appear eligible for listing under NRHP/CRHR Criterion A/1 as contributors to a historic district.



**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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**Criterion B/2:**        *Is associated with the lives of persons important in our past.*

Although numerous persons are historically associated with Wilshire Junior High School, archival and background research failed to indicate any associations with persons important in history. Therefore, the Wilshire Junior High School Historic District does not appear eligible for listing under NRHP/CRHR Criterion B/2.

**Criterion C/3:**        *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

The buildings constructed for the Wilshire Junior High School embody the distinctive characteristics of PWA/WPA Moderne, a modern architectural style that dates between 1933 and 1944 in the United States. Associated with public buildings constructed as part of the relief projects sponsored by the PWA/WPA, this style of architecture draws inspiration from Beaux-Arts classicism and Art Deco exuberance, presenting them in more conservative, understated ways that lend a feeling of monumentality and authority to the buildings. Although not uncommon in public buildings of this period, examples of entire campuses specifically designed in the PWA/WPA Moderne style are less common. Elements of the style include classically balanced, symmetrical forms; windows arranged vertically as recessed panels; and expanses of smooth stucco or concrete surfaces. The Wilshire Junior High School buildings incorporate all of these defining characteristics, as well as vertically oriented fluting reminiscent of classically fluted columns. These fluting groupings are located on either side of the main entrances and window groupings, further evoking the sense of classical columns. Subtle, unadorned, broad belt courses run along the building walls at a height under window sills, while the parapets are crowned with two horizontal recessed bands.

Although the Wilshire Junior High School buildings are unified by their PWA/WPA Moderne style and shared character-defining features, and they remain functionally related buildings, the buildings have been altered in recent years. The windows and doors on the classroom buildings were replaced at some point. It also appears that some exterior doors were added on both classroom buildings to enhance access, and that a couple of window groupings facing onto Lemon Street were closed in. The auditorium appears largely intact, with a minor alteration being the addition of a newer building adjacent to the east elevation, enclosing a previously exterior-facing wall.

Despite alterations to the original campus design plan and the addition of new buildings in recent years, the original 1936 PWA/WPA Moderne buildings still convey most of the major character-defining features of their style and design, and represent the notable work of a local architect. Therefore, although not rising to a national level of significance, the buildings appear

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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eligible for listing as contributors to the Wilshire Junior High School Historic District under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The buildings are unlikely to yield any information important to prehistory or history, nor are they associated with any archaeological resources. Therefore, the Wilshire Junior High School Historic District does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### **5.3.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the Wilshire Junior High School Historic District appears eligible for listing under the following criteria:

3. *Identification with a person or persons or groups who significantly contributed to the culture and development of the city.* The Wilshire Junior High School Historic District appears eligible for listing as part of the PWA/WPA projects carried out from 1933 to 1944.
5. *Exemplification of the best remaining architectural types in an area.* The historic district's buildings exemplify the PWA/WPA Moderne style, an architectural style uncommon in Fullerton despite the many projects that relied on PWA/WPA funding.
8. *Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.* The historic district's buildings represent a group of buildings designed in the PWA/WPA Moderne style, of which the preservation of each of the three buildings is necessary to maintain their integrity and recognition as a historic district.

### **5.3.3        Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.3.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Location:** The Wilshire Junior High School campus buildings have always occupied the same location. Although various functions may have changed within the buildings themselves, their location remains unchanged. Therefore, the historic district retains integrity of location.

**Design:** For historic districts, design concerns more than the integrity of the individual buildings. It also concerns the way in which buildings within the district are related and connected. Overall, contributing buildings within the historic district retain a preponderance of the major design elements and character-defining features of PWA/WPA Moderne that aesthetically unify them on the exterior, including their rectangular plans, board-formed concrete walls, rounded stairwells clad in glass mosaic tiles, reflected ceilings, cross-shaped smooth-formed concrete posts, recessed entrances, and minimal use of tinted glass panels. Exterior alterations to the buildings include replacement of the original windows and doors on the two classroom buildings, the addition of exterior access doors, and the removal and subsequent filling in of windows on the west elevation facing North Lemon Street.

Although there is some evidence for the removal of original interior materials and fixtures, the reconfiguration of interior spaces on any campus is a common occurrence in response to changes in enrollment capacity, education pedagogy, and building functionality. Additionally, minor changes were made to the interior of the auditorium to accommodate modern technology.

In consideration of integrity of design, the campus buildings appear to retain the requisite integrity of the PWA/WPA Moderne stylistic elements that unify them into a readily identifiable, cohesive whole.

**Setting:** The area surrounding the Wilshire Junior High School buildings has noticeably changed since the 1930s. Originally set in an area of Fullerton bordering agricultural land, the surrounding residential and commercial development expanded along with the campus during the Wilshire Junior High School Historic District's period of significance. An L-shaped building (the Chapman School) originally stood at the corner of East Chapman Avenue and North Lemon Street, blocking the view of the Wilshire Junior High School buildings from East Chapman Avenue. That building was demolished at some point after Fullerton College acquired the property in 1984. There were also grass-covered sports fields east of the Wilshire Junior High School buildings, which were paved over for parking after 1984. Therefore, the Wilshire Junior High School Historic District retains partial integrity of setting.

**Materials:** The historic district buildings retain the key exterior materials that date from their period of significance, namely wood-frame construction on 4-foot stem walls with layered plaster surfaces and minimal ornamentation in the form of elegant, classical fluting. The windows and doors on two of the three buildings were replaced at some point, with the design of



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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replacement windows being sympathetic to the original building aesthetics. The third building, the auditorium, is largely unaltered. Therefore, the Wilshire Junior High School Historic District retains the requisite integrity of materials.

**Workmanship:** The workmanship of the historic district is evident in the technology of the smooth expanses of concrete that shapes the buildings and the purposeful use of classical forms expressed in modern aesthetics. Overall, the Wilshire Junior High School Historic District retains integrity of workmanship.

**Feeling:** The Wilshire Junior High School Historic District buildings strongly express the PWA/WPA Moderne aesthetic. The combination of Beaux-Arts classicism and Art Deco exuberance, expressed in a more conservative, understated way, incorporates classically balanced, symmetrical forms; vertically arranged recessed windows; expanses of smooth stucco or concrete surfaces; and vertically oriented fluting reminiscent of classically fluted columns. Combined with subtle, unadorned, broad belt courses and parapets crowned with horizontal recessed bands, the buildings radiate a feeling of monumentality and authority. Therefore, the Wilshire Junior High School Historic District retains integrity of feeling.

**Association:** The Wilshire Junior High School Historic District is not associated with any important historic events or people.

### 5.3.4 Conclusions

The significance evaluation, including consideration of NRHP, CRHR, and local-level evaluation criteria and integrity requirements, indicate that the original 1936 campus buildings appear to be eligible as a historic district under NRHP Criterion A/CRHR Criterion 1; NRHP Criterion C/CRHR Criterion 3; and local criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose most well-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke's School in San Francisco.

As a result of these findings, the Wilshire Junior High School Historic District is considered a historical resource under CEQA. As such, the proposed project has the potential to adversely impact historical resources. Recommendations to reduce impacts to historical resources are provided in Chapter 6.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.4 325–327 North Newell Place**

#### **5.4.1 NRHP/CRHR Evaluation Criteria**

***Criterion A/1: Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.***

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City’s population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton’s population boom laid the groundwork for the City’s residential architectural foundation. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

Although the property at 325–327 North Newell Place was built during this period of residential growth and development, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 325–327 North Newell Place does not appear eligible under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

The 325–327 North Newell Place duplex appears to have been a rental property, with a long list of residents throughout its history. Although the building was built by J.R. Parker, who owned and built numerous homes in the vicinity of this property, archival research did not reveal any information about Parker being a significant historical figure. Archival research also failed to provide any additional significant information for any of the renters of the property over the years. Therefore, 325–327 North Newell Place does not appear eligible for listing under NRHP/CRHR Criterion B/2.



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion C/3:**      *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

One of the most prevalent styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style, to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

The property at 325–327 North Newell Place is a California Bungalow style duplex built during the 1920s residential boom in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, low pitched roof design with roof overhangs, exposed rafter tails, and a large front porch with brick-and-wood supports. However, the subject property is a common and unremarkable example of the style.

Because the Craftsman style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of California Bungalows that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalow style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Craftsman style, the subject property appears not eligible for listing under NRHP/CRHR Criterion C/3.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion D/4:** *Has yielded, or may be likely to yield, information important in prehistory or history.*

The duplex is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion D/4.

### 5.4.2 Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 325–327 North Newell Place duplex does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 325–327 North Newell Place was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.4.1 under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.4.1 under Criterion C/3, the property is a common example of the Craftsman style and is one of many examples throughout the City. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Craftsman architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 6.

7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The duplex does not display outstanding attention architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1920s throughout Southern California. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the duplex, so there is no bearing on the preservation of other historic resources. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a duplex residence, the building cannot be classified as a natural environment. Therefore, 325–327 North Newell Place does not appear eligible for listing under Criterion 10.

### 5.4.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.4.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Evaluation of the building at 325–327 North Newell Place did not find it significant under NRHP/CRHR or local criteria; thus it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building’s setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.4.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.5 420 East Chapman Avenue**

### **5.5.1 NRHP/CRHR Evaluation Criteria**

**Criterion A/I:** *Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City’s population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton’s population boom laid the groundwork for the City’s residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

Although the property at 420 East Chapman Avenue was built during this period of residential growth and development, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 420 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Archival research for the 420 East Chapman Avenue property indicated that the original owner John R. Parker, who owned the property from 1920 to 1948, was an educator at Fullerton Elementary Schools and also owned other residential properties in the general vicinity of 420 East Chapman Avenue (FNT 1951). Following Parker's ownership, another educator, J.S. Arnold, took over ownership of the property from 1955 to 1959. Arnold was an educator at FJC and served as the Social Science Chair (FNT 1959). Following Arnold's ownership of the property it appears the property was turned into residential rental property, with numerous occupants over the years. No other significant information was found on other residents and/or owners of the property. Therefore, 420 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

One of the most prevalent styles seen in Fullerton residential development of the early twentieth century is the Craftsman style, specifically the California Bungalow. Having originated in Southern California with Greene and Greene residential architecture, the movement spread throughout the United States and has an especially strong presence throughout California. During this boom period, the City of Fullerton experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style, to support the influx of agricultural workers and oil workers (DSD 2002; McAlester 2015).

The property at 420 East Chapman Avenue is a California Bungalow style residence built during the 1920s residential boom in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, low pitched roof design with roof overhangs, exposed rafter tails, and a large front

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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porch with brick-and-wood supports. However, the subject property is a common and unremarkable example of the style.

Because the Craftsman style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of California Bungalows that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalow style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Craftsman style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

***Criterion D/4:       Has yielded, or may be likely to yield, information important in prehistory or history.***

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 420 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### 5.5.2       Local Evaluation Criteria

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 420 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 420 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 1.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.5.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.5.1 under Criterion C/3, the property is a common example of the Craftsman style and is one of many examples throughout the City. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Craftsman architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1920s in Southern California. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the residence, so there is no bearing on the preservation of other historic resources. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 8.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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9. *A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.* Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. *Integrity as a natural environment that strongly contributes to the well-being of the people of the city.* Given the development of the parcel with a residence, the building cannot be classified as a natural environment. Therefore, 420 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### 5.5.3 Integrity Considerations

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.5.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 420 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.5.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.6 416 East Chapman Avenue**

### **5.6.1 NRHP/CRHR Evaluation Criteria**

***Criterion A/1:*** *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional (DSD 2002; McAlester 2015).

Although the property at 416 East Chapman Avenue was built during the Depression era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the Depression era. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 416 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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***Criterion B/2: Is associated with the lives of persons important in our past.***

Archival research for the 416 East Chapman Avenue property indicated that the original owner was John R. Parker; however, it does not appear that Parker ever resided at the property, as he was residing at 420 East Chapman Avenue during the early years of this property. There were a series of occupants for the building over the years, which further suggests its use as a rental property. No other significant information was found on other residents and/or owners of the property. Therefore, 416 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

The Great Depression and the years leading up to WWII showed a rapid decline in architectural development in cities like Fullerton, until New Deal programs like the PWA/WPA and Federal Housing Administration (FHA) were established in the 1930s. The FHA allowed provided mortgage insurance and published standards for small, modest housing options to help bolster the housing market during the Depression era. With programs like the FHA, residential development in cities like Fullerton was able to continue and residents were able to make it through the Depression years.

Prior to the 1930s, housing in Fullerton was modest but stylized to popular and affordable styles like the California Bungalow. However, the Depression years brought about the rise of more modest and less stylized home styles like Minimal Traditional, which would gain increased popularity during the war and post-war years because of its affordability, accessibility, and ease of construction. The Minimal Traditional style dominated the Southern California landscape during the 1930s and 1940s and provided a cost-effective housing option for veterans and families. Although typically built in housing tracts, Minimal Traditional homes are seen in earlier residential neighborhoods intermixed with California Bungalows (NRB 2002).

The property at 416 East Chapman Avenue is a Minimal Traditional style residence built during the Depression era in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, simple low pitched gabled roof with composition shingles, exterior clad in stucco, and a bay window with multi-paned windows. However, the subject property is a common and unremarkable example of the style (McAlester 2015).

Because the Minimal Traditional style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of Minimal Traditional residences that lack high artistic value but share a history of development with the neighborhood is best conveyed through residential

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the historic district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Minimal Traditional style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 416 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### **5.6.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 416 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 416 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.6.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with person or persons or groups who significantly contributed to the culture

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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and development of the City. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 3.

4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.6.1 under Criterion C/3, the property is a common example of the Minimal Traditional style and is one of many examples throughout the City. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Minimal Traditional architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1930s throughout Southern California. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the residence, so there is no bearing on the preservation of other historic resources. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the subject property, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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cannot be classified as a natural environment. Therefore, 416 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### **5.6.3 Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.6.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 416 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Review of Sanborn maps from 1927 and 1949 indicate that the surrounding areas to the south, east, and west of the subject property were significantly developed with single- and multi-family residences and there are few remaining empty parcels of land for development. The lack of Sanborn maps for the area to the north during this period, combined with historic aerial photographs, indicates that the land to the north was largely agricultural and not significantly developed. Post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.6.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.7 418 East Chapman Avenue**

#### **5.7.1 NRHP/CRHR Evaluation Criteria**

***Criterion A/I: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.***

The broad patterns of California history and cultural heritage related to the residential properties within the project area are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City of Fullerton due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional that would flourish in the 1940s (DSD 2002; McAlester 2015).

Post WWII Fullerton experienced a housing boom that continued until the 1970s due to the influx of veterans and the availability of land due to new City annexations. The housing boom was marked by the need for rental housing options for returning soldiers, because a great number of them were single. Duplexes and small apartment buildings became much more popular during this era and provided temporary relief for housing shortages. Throughout Fullerton, the popularity of tract housing emerged as an affordable and accessible housing option that could be built very quickly (Mudrick et al. 2015).

Although the property at 418 East Chapman Avenue was built during the important boom era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the post-war era. Due to a lack of

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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significant contributions to the broad pattern of history or cultural heritage, the property located at 418 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion A/1.

***Criterion B/2: Is associated with the lives of persons important in our past.***

Archival research revealed a series of occupants for the building over the years, which is consistent with its function as a duplex rental unit. No other significant information was found on other residents and/or owners of the property. Therefore, 418 East Chapman Avenue does not appear eligible under NRHP/CRHR Criterion B/2.

***Criterion C/3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.***

Prior to the 1950s, housing in Fullerton was largely modest and affordable with styles like the California Bungalow and Minimal Traditional. However, the post-war era in Fullerton sparked mass produced housing options on a scale never seen before in Fullerton in the form of tract housing. Innovators of tract housing developments in Fullerton like the Jewett Brothers were able to build homes in as little as 3 days. The following quote from *Fullerton: The Boom Years* sheds light on the housing boom in Fullerton in the 1950s:

In 1955 alone, the city approved fifty-five new tracts for a total of 3,941 lots, with the tracts ranging in size from 12 to 205 lots. By August 24, 1955, city staff reported that twenty-seven homes were being added to the city's residential areas every weekday (Mudrick et al. 2015).

The property at 418 East Chapman Avenue is an example of a post-war tract house in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: one-story height, modesty in scale and massing, simple low pitched hipped roof with composition shingles, exterior clad in stucco, poured concrete foundation, metal windows, little to no ornamentation, rectangular plan, and a box-like aesthetic. However, the subject property is a common and unremarkable example of the style (NRB 2002; McAlester 2015).

The tract houses of Fullerton were modest in size and scale, and tended to be rectangular and boxy with little to no ornamentation.

Because the tract house style is so prevalent throughout Southern California residential neighborhoods, an individually eligible property must be able to convey the essential and unique elements of the style. The significance of tract house residences that lack high artistic value but share

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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a history of development with the neighborhood is best conveyed through residential historic districts. Historic districts exemplify the style through a concentration of buildings unified aesthetically by their collective character-defining features and shared history of development.

The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the tract house style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**        *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 418 East Chapman Avenue does not appear eligible for listing under NRHP/CRHR Criterion D/4.

### **5.7.2        Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 418 East Chapman Avenue residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 418 East Chapman Avenue was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.7.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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culture and development of the City. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 3.

4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.7.1 under Criterion C/3, the property is a common example of the tract house style and is one of many examples throughout the City. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of tract house architecture, which retain integrity of materials and design and embody the characteristics of the style. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of residential construction using materials and techniques that were used throughout the 1950s throughout Southern California. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 7.
8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the duplex, so there is no bearing on the preservation of other historic resources. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the duplex, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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cannot be classified as a natural environment. Therefore, 418 East Chapman Avenue does not appear eligible for listing under Criterion 10.

### **5.7.3 Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.7.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 418 East Chapman Avenue did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Aerial photographs show how post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

### **5.7.4 Conclusions**

As a result of the significance evaluation, the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

## **5.8 409 North Newell Place**

### **5.8.1 NRHP/CRHR Evaluation Criteria**

**Criterion A/I:** *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

The broad patterns of California history and cultural heritage related to the residential properties on the project site are early twentieth century residential development patterns within the City of Fullerton. Although the residential properties are now owned by Fullerton College, they were acquired many years after the property was developed.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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The City experienced an outward expansion from its original town plan in the 1910s. Further population growth and development continued in the 1920s due to positive economic conditions brought on by the oil boom and the citrus farming boom in Fullerton. By the 1930s, the City's population had more than doubled. Review of Sanborn maps from 1917 and 1927 illustrates the impact of the growing population, as growth and development of the City began to develop high-density neighborhoods. Like other cities throughout the United States, Fullerton's population boom laid the groundwork for the City's residential architectural foundation. During this boom period, the City experienced a large amount of single-family and small multi-family residential construction, with most buildings designed in the California Bungalow style. The affordability and accessibility of this architectural style facilitated residential development to support the influx of agricultural workers and oil workers. Following the housing boom in the 1920s, the 1930s were marked by a period of little architectural development in the City due to the Great Depression; however, there were some examples of home building at the time in modest styles like Minimal Traditional that would flourish in the 1940s (DSD 2002; McAlester 2015).

Post WWII Fullerton experienced a housing boom that continued until the 1970s due to the influx of veterans and the availability of land due to new City annexations. The housing boom was marked by the need for rental housing options for returning soldiers, because a great number of them were single. Duplexes and small apartment buildings became much more popular during this era and provided temporary relief for housing shortages. Throughout Fullerton, the popularity of Mid-Century Modern housing styles emerged as an affordable and accessible housing options (Mudrick et al. 2015).

Although the property at 409 North Newell Place was built during the important boom era, it is not significant to the broad pattern of development. It is one of many modest residential buildings constructed throughout Southern California in the post-war era. Due to a lack of significant contributions to the broad pattern of history or cultural heritage, the property located at 409 North Newell Place does not appear eligible under NRHP/CRHR Criterion A/1.

***Criterion B/2:           Is associated with the lives of persons important in our past.***

Archival research revealed a series of occupants for the building over the years, which is consistent with its function as a multi-family rental unit. No other significant information was found on other residents and/or owners of the property. Therefore, 409 North Newell Place does not appear eligible under NRHP/CRHR Criterion B/2.

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Criterion C/3:**      *Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

Prior to the 1950s, housing in Fullerton was largely modest and affordable with styles like the California Bungalow and Minimal Traditional. However, the post-war era in Fullerton sparked the need for efficient and higher-density housing options such as duplexes and apartment buildings. One of the popular styles for apartment buildings in the post-war era was Mid-Century Modern, as it was more stylized than the popular tract house forms but was also able to be constructed with easily accessible and cost-effective building materials.

The property at 409 North Newell Place is an example of a Mid-Century Modern apartment building in the City of Fullerton. The property appears to retain the requisite integrity and exemplifies some of the most basic character-defining features of the style: two-story height, exterior staircase, flush-mounted metal windows, low pitched roof design, exterior clad in stucco, and a second-floor balcony with modestly detailed railing. However, the subject property is a common and unremarkable example of the style (NRB 2002; McAlester 2015).

The building at 409 North Newell Place is a common and unremarkable example of a prevalent architectural style in Southern California and does not possess high artistic value. The subject property is adjacent to the northern boundary of the East Townsite Historic District, which includes a concentration of California Bungalows intermixed with Minimal Traditional style residences. The entire block on which the subject property is located is intentionally excluded from the adjacent historic district due to its commercial zoning classification. Adjacent buildings within the historic district have been zoned as R-2P, a residential preservation zone classification. Further, the block on which the subject property is located appears to lack the unified aesthetic necessary to qualify as a historic district. Given its lack of significance with relation to the Mid-Century Modern style, the subject property appears not eligible under NRHP/CRHR Criterion C/3.

**Criterion D/4:**      *Has yielded, or may be likely to yield, information important in prehistory or history.*

The residence is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, 409 North Newell Place does not appear eligible for listing under NRHP/CRHR Criterion D/4.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.8.2 Local Evaluation Criteria**

According to the criteria for designating a local historic landmark as defined in the City of Fullerton Municipal Code, Ordinance 2982, Section 15.48.060, the 409 North Newell Place residence does not appear eligible for listing under the following criteria:

1. ***Character, interest or value as part of the heritage of the city.*** Although the property at 409 North Newell Place was built during a significant period of residential growth and development in the City of Fullerton, it is not significant to the broad pattern of development. It is one of many residential buildings constructed to support the population boom. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 1.
2. ***Location as a site of a historic event.*** Archival research failed to indicate any significant historic events at this property. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 2.
3. ***Identification with a person or persons or groups who significantly contributed to the culture and development of the city.*** As discussed in Section 5.8.1, NRHP/CRHR Evaluation Criteria, under Criterion B/2, archival research did not reveal any significant associations with a person or persons or groups who significantly contributed to the culture and development of the City. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 3.
4. ***Exemplification of a particular architectural style or way of life important to the city.*** As discussed in Section 5.8.1 under Criterion C/3, the property is a common example of the Mid-Century Modern style and is one of many examples throughout the City. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 4.
5. ***Exemplification of the best remaining architectural types in an area.*** The City of Fullerton has many excellent examples of Mid-Century Modern architecture that retain integrity of materials and design and embody the characteristics of the style. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 5.
6. ***Identification as the work of a person or persons whose work has influenced the heritage of the city, the state of California or the United States.*** Building development research did not indicate any identification as the work of a person or persons whose work has influenced the heritage of the City, the State of California, or the United States. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 6.
7. ***Embodiment of elements of outstanding attention to architectural design, detail, materials, or craftsmanship.*** The residence does not display outstanding attention to architectural design, detail, materials, or craftsmanship. It is a common example of

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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residential construction using materials and techniques that were used throughout the 1950s throughout Southern California. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 7.

8. ***Relationship to other landmarks, where the preservation of one has a bearing on the preservation of another.*** The subject property is located directly north of the East Townsite Historic District, and was intentionally excluded from the boundary of this district. No further potential historic districts or landmarks were identified in the vicinity of the apartment building, so there is no bearing on the preservation of other historic resources. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 8.
9. ***A unique location or singular physical characteristic representing an established and familiar visual feature of a neighborhood.*** Given the proximity of numerous residences to the apartment building, the location of the residence is not unique. The residence is in keeping with materials, scale, and massing at adjacent properties. The property has no unique characteristics that distinguish it from adjacent residential properties. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 9.
10. ***Integrity as a natural environment that strongly contributes to the well-being of the people of the city.*** Given the development of the parcel with a residence, the building cannot be classified as a natural environment. Therefore, 409 North Newell Place does not appear eligible for listing under Criterion 10.

### **5.8.3 Integrity Considerations**

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the NRHP or CRHR must meet one of the criteria of significance discussed in Section 5.8.1, NRHP/CRHR Evaluation Criteria, and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. Furthermore, integrity must be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Evaluation of the building at 409 North Newell Place did not find it significant under NRHP/CRHR or local criteria; thus, it does not have a period of significance or relevant associations to evaluate. It is notable that the building does retain integrity of location, design, materials, workmanship, and feeling. However, the building's setting is compromised by the development of the surrounding area since the date of construction. Aerial photographs show how post-war development at FJC led to significant campus expansion and development of large agricultural areas to the north of the subject property, which compromised the original integrity of setting for the subject property.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **5.8.4 Conclusions**

The significance evaluation indicates that the subject property appears not eligible under all NRHP, CRHR, and local-level evaluation criteria and integrity requirements. Therefore, the subject property is not considered a historical resource under CEQA.

### **5.9 428, 434, and 438 East Chapman Avenue**

In 2015, GPA evaluated three properties on the project site located at 428, 434, and 438 East Chapman Avenue and reached the following conclusions from their evaluations:

None of the properties at 428, 434, or 438 East Chapman Avenue are currently designated under any national, state, or local landmark programs. They were evaluated in this report as part of the CEQA compliance process. None of the properties appear to be eligible for listing in the National Register, California Register, or for designation as a Fullerton Historical Landmark due to a lack of historical or architectural significance. In the case of the property at 438 East Chapman Avenue, its eligibility is also affected by its lack of integrity. Additionally, none of the properties appear to contribute to a potential historic district. The recommended evaluation code for all properties on the project site is 6Z, ineligible for designation at the national, state, and local levels through survey evaluation. Therefore, the properties at 428, 434, and 438 East Chapman Avenue are not historical resources subject to CEQA. As the project will have no impact on historical resources, no further study is recommended or required (GPA 2015).

Dudek reviewed the GPA report from 2015 in its entirety and concurs with the findings presented in the report by GPA. Given the extensiveness of the survey and its recent date of evaluation, Dudek does not feel that any further study is necessary on these properties.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

## 6 IMPACTS ANALYSIS

Based on the information contained in the *Proposed Facilities Master Plan Updates* (District 2016b), some Master Plan elements will be assessed at the program level because specific project details are not known at this time. Other Master Plan elements have detailed information available and will receive project-level assessment. As described in the project description (Section 1.2), the District is proposing various improvements to the Fullerton College Campus that include new construction, renovation, and demolition. The following paragraphs provide an impacts analysis of all proposed activities. Table 7 provides an overview of all identified impacts to historical resources and any associated mitigation measures to reduce impacts (see Section 6.5, Recommended Mitigation, for full text of mitigation measures).

**Table 7  
Summary of Impacts and Mitigation**

Building/Structure	Level of Impact Before Mitigation	Identified Impacts	Level of Impact After Mitigation
<i>Demolition (Project Level)</i>			
Berkeley Center (3000)	<b>Significant</b>	The Berkeley Center is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1
Horticulture (1600)	Less than significant	The horticulture complex was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant  No mitigation required
Theatre Arts (1300)	<b>Significant</b>	The Theatre Arts building is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1
Music (1100)	<b>Significant</b>	The Music building is a contributor to the Mid-Century Modern Campus Expansion Historic District. Demolition of an historical resource is a significant unavoidable impact.	<b>Significant</b> (demolition of an historical resource cannot be mitigated below a level of significance)  See MM-CUL-1



## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Student Services (2000)	Less than significant	The Student Services building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Media Services-Academic Computing-Maintenance and Operation Shops (2300)	Less than significant	The temporary Media Services building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Classrooms (1955-1960)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
Classrooms (1901-1904)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
Office (2200)	Less than significant	The temporary Micro Computer Lab building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant No mitigation required
Child Development (1800, 1810, 1820, and 1830)	Less than significant	The temporary classroom buildings were found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
<i>Demolition (Program Level)</i>			
428, 434, and 438 East Chapman Avenue and 400 North Newell Place	Less than significant	These buildings were found not eligible under all NRHP, CRHR and City designation criteria. Therefore, they are not historical resources.	Less than significant No mitigation required
<i>Renovation (Project Level)</i>			
Math (600)	<b>Potentially significant</b>	<p>The Math building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include:            -alteration/removal of interior CDFs            -new exterior fenestrations for air intakes            -replacement of original handrails            -ADA renovations</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Physical Education (1200)	<b>Potentially significant</b>	The PE building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -ADA renovations	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Wilshire Theatre (2100)	<b>Potentially significant</b>	The Wilshire Theatre was found eligible as a contributor to the Wilshire Junior High School Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -alteration/removal of interior CDFs -ADA renovations -addition of new box office	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Business (300)	<b>Potentially significant</b>	The Business building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building. However, more detail is needed to fully assess the level of impact.  Potentially significant impacts include: -alteration/removal of interior CDFs -alteration/removal of exterior CDFs -new exterior fenestrations for air intakes -replacement of original handrails -ADA renovations	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Humanities (500)	<b>Potentially significant</b>	The Humanities building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.  Potentially significant impacts include: -reconstruction of stairs and ramps -application of board form finish on exterior -application of roof tiles	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Campus Services (840)	Potentially significant	<p>The Campus Services building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -addition of testing space -doorway modifications and other ADA renovations</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Administration Building (100)	Potentially significant	<p>The Administration building was found eligible as a contributor to the Fullerton Junior College Campus Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -renovation of front upon removal of 1950s addition -renovation to entrance and basement</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Fine Arts Gallery (1000)	Potentially significant	<p>The Fine Arts Gallery building was found eligible as a contributor to the Mid-Century Modern Campus Expansion Historic District. Proposed renovation activities have the potential to significantly impact the building.</p> <p>Potentially significant impacts include: -installation of new glass doors -application of board form finish to exterior -replacement of elevator -replacement of handrails</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Academic Computing (3100)	Less than significant	The Academic Computing building was found not eligible under all NRHP, CRHR, and City designation criteria. Therefore, it is not a historical resource.	Less than significant  No mitigation required
<i>New Construction (Project Level)</i>			
Welcome Center	Potentially significant	<p>See Demolition section above for a discussion of impacts related to demolition of the Music building (1100).</p> <p>Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.</p>	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
New Instructional Building	Potentially significant	The proposed design/style of the new building is currently unknown.  Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Horticulture and Vocational Services Center	Less than significant	Although the proposed design/style of the new buildings is currently unknown, the proposed location of the new building is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Centennial Parking Structure	Less than significant	The proposed location of the new parking structure is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Pedestrian Bridge	Less than significant	The proposed location of the new bridge is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction. Further, the bridge will only connect with new construction.	Less than significant  No mitigation required
Realignment of Campus Access to the Centennial Parking Structure	Less than significant	The proposed location of the campus access realignment is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.	Less than significant  No mitigation required
Parking Lots	Less than significant	See Demolition section above for a discussion of impacts related to demolition of the Berkeley Center building (3100); Theatre Arts building (1300); and 428, 434, and 438 E. Chapman Avenue and 400 N. Newell Place residential buildings.  The proposed location of the new parking lots will not impact any adjacent historical resources.	Less than significant  No mitigation required

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Table 7  
Summary of Impacts and Mitigation**

<b>Building/Structure</b>	<b>Level of Impact Before Mitigation</b>	<b>Identified Impacts</b>	<b>Level of Impact After Mitigation</b>
Maintenance and Operation Facility, Chiller Plant Addition, and Thermal Energy Storage	Less than significant	<p>The proposed location of the new Maintenance and Operation Facility is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.</p> <p>The Chiller Plant was is of recent construction and is at a significant distance from any historic district buildings.</p> <p>The proposed thermal energy storage tank building addition is at significant distance from any historic district buildings, and is located within a portion of campus that is primarily of recent construction.</p>	<p>Less than significant</p> <p>No mitigation required</p>
Aquatics Center	Less than significant	The pool area is of recent construction, so construction of the new shower/locker room will not impact surrounding historical resources.	<p>Less than significant</p> <p>No mitigation required</p>
Performing Arts Complex	<b>Potentially significant</b>	<p>See Renovation section above for a discussion of impacts related to renovation of the Wilshire Theatre.</p> <p>Although the proposed Performing Arts Complex will block the view of the Wilshire Junior High School Historic District from Chapman Avenue, the district was blocked by two buildings (part of the Chapman School) during its period of significance. The existing sculpture garden was installed relatively recently (between 1980 and 1995) and does not contribute to the significance of the district or its historic setting. However, construction of the new building in close proximity to the Wilshire Junior High School Historic District has the potential for construction-related impacts.</p>	<p>Less than significant after implementation of MM-CUL-3</p>

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

**Table 7**  
**Summary of Impacts and Mitigation**

Building/Structure	Level of Impact Before Mitigation	Identified Impacts	Level of Impact After Mitigation
<i>New Construction (Program Level)</i>			
Chapman–Newell Instructional Building	<b>Potentially significant</b>	See Demolition section above for a discussion of impacts related to removal of the 428, 434, and 438 E. Chapman Avenue and 400 N. Newell Place residential buildings.  Potential significant impacts include: -incompatible massing, size, scale, and architectural features in relation to adjacent historic buildings. -damage to adjacent historic buildings.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
<i>Site Improvement Elements</i>			
Parking/Vehicular Entry Improvements	Less than significant	None of the proposed on-campus circulation improvements appear to be near historical resources, nor would they disrupt any historic patterns of circulation.	Less than significant  No mitigation required
Pedestrian Circulation	<b>Potentially significant</b>	Although no specific information is known at this time, potential significant impacts include: -disruption of existing spatial relationships. -alteration of historic district CDFs.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3
Infrastructure Improvements	<b>Potentially significant</b>	Although no specific information is known at this time, potential impacts resulting from infrastructure improvements include: - exterior modifications to historic buildings to accommodate new utility connections.	Less than significant after implementation of MM-CUL-2 and MM-CUL-3

CDF = character-defining feature; ADA = Americans with Disabilities Act.

## 6.1 Proposed Demolition

The proposed project includes the demolition of multiple buildings as part of implementation of the Facilities Master Plan. These buildings include the Berkeley Center (3000), Horticulture (1600), Theatre Arts (1300), Music (1100), Student Services (2000), Media Services (2300), Classrooms 1955–1960, Classrooms 1901–1904, Office (2200), and Child Development (1800, 1810, 1820, and 1830) buildings. The project also proposes removal of the residences at 428, 434, and 438 East Chapman Avenue and 400 North Newell Place at a program level.

Three of the buildings proposed for demolition, the Berkeley Center (3000), Theatre Arts (1300), and Music (1100) buildings, are contributing elements of the Mid-Century Modern Campus Expansion Historic District on campus and are considered historical resources under CEQA.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Demolition of an historical resource constitutes “substantial adverse change” and is considered a significant effect on the environment (14 CCR 15064.5(b)) that cannot be mitigated below a level of significance. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate below a level of significance. Mitigation for demolition of these buildings is provided in Section 6.5 (see MM-CUL-1). It is recommended that a preservation alternative be explored as part of the EIR to avoid a significant impact.

The Horticulture (1600), Student Services (2000), Media Services (2300), Classrooms 1955–1960, Classrooms 1901–1904, Office (2200), and Child Development (1800, 1810, 1820, and 1830) buildings are not considered historical resources under CEQA. Therefore, demolition of these buildings would result in a less than significant impact. No mitigation is required.

### **6.2 Proposed Renovations**

The project proposes renovations to the following buildings as part of implementation of the Facilities Master Plan: Math (600), Physical Education (1200), Wilshire Theatre (2100), Business (300), Humanities (500), Campus Services (840), Administration (100), Fine Arts Gallery (1000), and Academic Computing (3100).

Eight of the nine buildings proposed for renovation are considered historical resources under CEQA. The Math (600), Business (300), Campus Services (840), and Administration (100) buildings are contributing elements of the Fullerton Junior College Campus Historic District; the Physical Education (1200), Humanities (500), and Fine Arts Gallery (1000) buildings are contributing elements of the Mid-Century Modern Campus Expansion Historic District; and the Wilshire Theatre (2100) is a contributing element of the Wilshire Junior High School Historic District. Therefore, it is necessary to evaluate potential impacts to these buildings resulting from the proposed renovation activities.

#### **6.2.1 Interior Renovations**

Most campus buildings have been subject to extensive interior renovations that have compromised their interior integrity. However, three buildings, Math (600), Business (300), and Administration (100), were found to retain interior character-defining features that contribute to the significance of the resources, and should be protected/preserved during campus renovation activities. All three of these buildings are contributors to the Fullerton Junior College Campus Historic District. Interior features that should be retained include the following:

- Recessed doorways
- Wood doors with stacked panels

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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- Decorative iron work (including stair railings; light fixtures in buildings 100 and 300)
- Barrel vault ceilings
- Brass door hardware

In thoughtful treatment of interior character-defining features, impacts to building interiors can be less than significant with mitigation incorporated (see MM-CUL-2 in Section 6.5).

### **6.2.2 ADA Compliance Renovations (Interior and Exterior)**

ADA compliance modifications are proposed for all buildings undergoing renovation. In order to avoid significant impacts to historical resources, the District shall complete these renovations in a manner that is sensitive to the architectural style of the buildings/historic districts. The Secretary of the Interior's Guidelines for Rehabilitation includes an "Accessibility" section which provides guidance for making modifications to historic buildings that are in compliance with current accessibility codes while still maintaining important character-defining features, spaces, and finishes. National Park Service Preservation Brief 32, *Making Historic Properties Accessible* (Jester and Park 1993), also provides specific guidance on how to make historic buildings ADA accessible while minimizing changes to historic materials and features. Impacts resulting from ADA compliance work can be less than significant with mitigation incorporated (see MM-CUL-2 in Section 6.5).

### **6.2.3 Exterior Renovations**

The following provides an overview of proposed renovation activities that will impact the exterior of historic buildings. The specific details of the proposed renovation activities for each individual building are not known. However, this list identifies proposed renovation activities with the potential to significantly impact historic buildings and structures on campus (note that this list does not constitute a complete/final list of proposed exterior renovations):

- ADA compliance modifications (all buildings)
- Incorporation of new exterior fenestrations/louvers for air intakes (Math 600 and Business 300)
- Changes to building access/entrances (Physical Education 1200, Wilshire Theatre 2100, Business 300, Administration 100, and Fine Arts Gallery 1000)
- Designated box office for the Wilshire Theatre (2100) building
- Application of board-formed finish and/or Spanish roof tiles on Humanities (500) and Fine Arts Gallery (1000) buildings to match the original campus buildings
- Demolition of 1957 addition on Administration (100) building



## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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These proposed exterior renovations have the potential to adversely impact historical resources, because they are proposed for buildings that contribute to the historic district on campus. Further, the vast majority of the identified character-defining features are found on the buildings' exteriors. Most of the impacts associated with the above-described proposed exterior renovations will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). However, it is strongly recommended that some of the proposed changes be reconsidered, as they are unlikely to be mitigated below a level of significance. This includes the application of a board-formed concrete finish and Spanish roof tiles to the Humanities (500) and Fine Arts Gallery (1000) buildings. Because these are Mid-Century Modern style buildings, the application of Spanish Revival style details is considered incompatible with the existing style and aesthetic of the modern buildings, and does not conform to the Standards for Rehabilitation. If these proposed modifications are carried forward, they will likely result in a significant impact to historical resources. It is recommended that a preservation alternative be explored as part of the Program EIR to avoid a significant impact.

Some of the more substantial renovation activities have the potential to adversely impact adjacent historic buildings. In consideration of indirect impacts to adjacent buildings, it is strongly recommended that a preservation plan be developed that includes protection measures for historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

### **6.3 Proposed New Construction**

The project proposes construction of the following new facilities/elements on campus: Welcome Center, Instructional building, Horticulture and Vocational Services Center, Centennial Parking Structure, pedestrian bridge, campus realignment for access to new parking structure, parking lots, Maintenance and Operation Facility, Chiller Plant addition, Thermal Energy Storage, Aquatics Center, Performing Arts Complex, and Chapman–Newell Instructional building.

Much of the proposed new construction will occur in the recently developed northern portion of campus, at a significant distance from historic buildings. This includes the Horticulture and Vocational Services Center, Centennial Parking Structure, pedestrian bridge, campus realignment for access to new parking structure, parking lots, Maintenance and Operation Facility, Chiller Plant addition, Thermal Energy Storage, and Aquatics Center. Because there are no direct or indirect impacts identified for historical resources, no additional mitigation is required for these construction activities.

Construction of the proposed Welcome Center and Instructional buildings has the potential to adversely impact adjacent historic buildings. The new buildings' designs should take into account the massing,

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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size, scale, and architectural features in relation to adjacent historic buildings. Most of the impacts associated with new construction adjacent to historic buildings will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

Although the proposed Performing Arts Complex will block the view of the Wilshire Junior High School Historic District from Chapman Avenue, the district was blocked by two buildings (part of the Chapman School) during its period of significance. The existing sculpture garden was installed relatively recently (between 1980 and 1995) and does not contribute to the significance of the district or its historic setting. However, construction of the new building in close proximity to the Wilshire Junior High School Historic District creates a potential for construction-related impacts. In consideration of indirect impacts to adjacent buildings, it is strongly recommended that a preservation plan be developed that includes protection measures for historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3 in Section 6.5).

Construction of the proposed Chapman–Newell Instructional building has the potential to adversely impact adjacent historic buildings. The new buildings' designs should take into account the massing, size, scale, and architectural features in relation to the southerly adjacent East Townsite Historic District. Most of the impacts associated with new construction adjacent to historic buildings will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

### **6.4 Site Improvement Elements**

Various site improvement elements include new signage at campus entryways, clear and safe vehicular drop-offs, and creation of more pedestrian pathways.

#### **6.4.1 Parking/Vehicular Entry Improvements**

None of the proposed on-campus vehicular circulation improvements appear to be near historical resources, nor would they disrupt any historic patterns of circulation.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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### **6.4.2 Pedestrian Circulation**

The specific details of changes to existing pedestrian pathways on campus are not fully known. Therefore, proposed modifications must be considered a potentially significant impact to adjacent historical resources, because inappropriately modified pathways would potentially disrupt important spatial relationships and character-defining features within historic districts. Most of the impacts associated with pedestrian circulation improvements would be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

### **6.4.3 Infrastructure Improvements**

The connection of new utility lines to historic buildings has the potential to alter interior and exterior character-defining features. Therefore, proposed infrastructure improvements must be considered a potentially significant impact to historical resources. Most of the impacts associated with infrastructure improvements will be less than significant with incorporation of mitigation, specifically, conformance with the Secretary of the Interior's Standards for Rehabilitation (see MM-CUL-2 in Section 6.5). Further, it is strongly recommended that a preservation plan be developed that includes protection measures for adjacent historic buildings during demolition, renovation, and new construction activities (see MM-CUL-3).

## **6.5 Recommended Mitigation**

The following mitigation is recommended only after a thorough consideration of alternatives to activities that will result in substantial adverse change to historical resources on campus. Although the following mitigation measure will not reduce impacts below a level of significance, CEQA requires that all feasible mitigation be undertaken.

**MM-CUL-1** Prior to demolition of the Berkley Center (3000), Theatre Arts building (1300), and Music building (1100), the North Orange County Community College District (District) shall ensure preparation of Level II Historic American Building Survey (HABS) documentation in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation. Documentation shall be completed by a qualified historic preservation professional who meets the Secretary of the Interior's Professional Qualifications Standards for history or architectural history. The documentation shall capture the physical condition of the existing building with (1) existing drawings (where available), (2) photographs of the buildings with large-

## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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format negatives using an experienced HABS photographer, and (3) a written narrative that includes a history and architectural description of the buildings and highlights their historical significance.

One original copy of the final HABS documentation packet shall be offered to the following entities:

- The Library of Congress HABS Collection (to be offered as a donation only)
- The South Central Coastal Information Center at California State University, Fullerton
- City of Fullerton Planning Department
- Fullerton College Library
- Fullerton Public Library Main Branch (Local History Room)
- Fullerton Heritage
- Orange County Public Library
- Orange County Archives
- Orange County Historical Society

The following mitigation is recommended to reduce potentially significant impacts to historical resources to a less than significant level:

**MM-CUL-2** Prior to the start of new construction, additions, renovations (including Americans with Disabilities Act (ADA) compliance work), or site improvements within or adjacent to historical resources, including buildings within the Fullerton Junior College Campus Historic District, the Fullerton College Mid-Century Modern Historic District, the Wilshire Junior High School Historic District, and the East Townsite and College Park residential historic districts, associated design schematics/project plans shall be reviewed for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, specifically, the Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Further, all proposed ADA compliance work shall reference both the "Accessibility Considerations" section of the Rehabilitation Guidelines and National Park Service Preservation Brief 32, Making Historic Properties Accessible to ensure that ADA compliance work minimizes changes to historic materials and features. The project plan/schematic design review shall be completed by a qualified architectural historian or historic preservation specialist

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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who meets the Secretary of the Interior's Professional Qualification Standards for Architectural History. Upon review, the qualified specialist may recommend changes/revisions to project plans in order to obtain conformance with the Standards for Rehabilitation. Alternatively, the District may choose to work with a preservation architect who meets the Secretary of the Interior's Professional Qualification Standards.

- MM-CUL-3** An appropriate level of protection shall be provided for adjacent district buildings during proposed new construction and renovation activities. A preservation plan shall be developed to provide these details. At a minimum, protective fencing shall be used during construction activities so district buildings are not inadvertently impacted. The preservation plan shall also examine the potential effects of vibration resulting from nearby demolition and construction activities. The final preservation plan shall be appended to the final set of construction plans.

# Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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## 7 SUMMARY AND MANAGEMENT RECOMMENDATIONS

### 7.1 Summary of Findings

#### 7.1.1 Built Environment

As a result of the significance evaluations for NRHP, CRHR, and City of Fullerton historical landmark eligibility criteria and integrity, the following historical resources were identified on the Fullerton College campus:

- **Fullerton Junior College Campus Historic District.** The original 1930s–1940s FJC Campus appears to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3, as well as City of Fullerton historical landmark criteria 1, 5, 6, 7, and 8, for its association with WWII and the G.I. Bill and for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Spanish Colonial Revival style. The buildings also represent the notable work of master architect Harry K. Vaughn, who created some of his most important work as an individual architect during the historic district’s period of significance (1935–1942).
- **Mid-Century Modern Campus Expansion Historic District.** The buildings designed by William Henry Taylor during the late 1950s through the 1960s appear to be eligible as a historic district under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, and 8, for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the International and New Formalism styles. The buildings also represent the notable work of modern architect Taylor.
- **Music Building (Building 1100).** This building appears eligible as both a district contributor (of the Mid-Century Modern Campus Expansion Historic District) and an individual property under NRHP/CRHR Criterion C/3, as well as City of Fullerton historical landmark criteria 5, 6, 7, 8, and 9, for its high artistic value associated with the New Formalism style and for its location prominently anchoring the southwest corner of campus.
- **Wilshire Junior High School Historic District.** The original 1936 Wilshire Junior High School campus buildings appear to be eligible as a historic district under NRHP/CRHR Criteria A/1 and C/3 and City of Fullerton historical landmark criteria 3, 5, and 8 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the PWA/WPA Moderne style. The buildings also represent the notable work of architect Donald Beach Kirby, whose best-known projects are the 1940 Maharajah of Indore Residence in Santa Ana and the 1950 Miss Burke’s School in San Francisco.

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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As a result of these findings, the proposed project has the potential to adversely impact historical resources (see Table 7 in Section 6, Impacts Analysis). Management recommendations to reduce impacts to historical resources are provided in Section 7.2.

### **7.1.2 Archaeology**

No archaeological resources were identified within the project site as a result of the CHRIS records search or Native American coordination. However, it is always possible that intact archaeological deposits are present at subsurface levels. For these reasons, the project site should be treated as potentially sensitive for archaeological resources. Management recommendations to reduce potential impacts to unanticipated archaeological resources and human remains during campus construction activities are provided in Section 7.2.

## **7.2 Management Recommendations**

### **7.2.1 Built Environment Resources**

It is recommended that the District explore a reasonable range of preservation alternatives in the Program EIR for proposed demolition activities that would result in a significant impact to identified historical resources. This includes demolition of the Berkeley Center (3000), Theatre Arts (1300), and Music (1100) buildings. Demolition of a historical resource constitutes “substantial adverse change” and is considered a significant effect on the environment (14 CCR 15064.5(b)) that cannot be mitigated below a level of significance. However, CEQA requires that all feasible mitigation be undertaken even if it does not mitigate below a level of significance. Mitigation for demolition of these buildings is provided in Section 6.5 (see MM-CUL-1).

It is further recommended that the District make all proposed renovations and plans for new construction in conformance with the Secretary of the Interior’s Standards and Guidelines for Rehabilitation (see MM-CUL-2) in order to reduce potentially significant impacts to a less than significant level; finally, it is recommended that the District prepare a preservation plan that details how historical resources will be protected during renovations and adjacent demolition and construction activities (see MM-CUL-3).

### **7.2.3 Archaeological Resources**

#### **Unanticipated Discovery of Archaeological Resources**

In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the

## **Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR**

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Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); PRC Section 21082), the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery, may be warranted.

### **Unanticipated Discovery of Human Remains**

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, the County Coroner shall notify the NAHC in Sacramento within 24 hours. In accordance with PRC Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendant from the deceased Native American. The most likely descendant shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.



**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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## Cultural Resources Study for the Fullerton College Facilities Master Plan Program EIR

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**Cultural Resources Study for the  
Fullerton College Facilities Master Plan Program EIR**

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**CONFIDENTIAL**  
**APPENDIX A**  
*Records Search Results*



# **APPENDIX B**

## ***NAHC and Native American Coordination***



**NATIVE AMERICAN HERITAGE COMMISSION**

1550 Harbor Blvd., Suite 100  
West Sacramento, CA 95691  
(916) 373-3710  
(916) 373-5471 FAX



January 19, 2017

Samantha Murray  
Dudek

Sent by E-mail: smurray@dudek.com

RE: Proposed Fullerton College Facilities Master Plan Project, City of Fullerton; La Habra and Anaheim USGS  
Quadrangles, Orange County, California

Dear Ms. Murray:

Attached is a contact list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. A search of the SFL was completed for the USGS quadrangle information provided with negative results.

**Our records indicate that the lead agency for this project has not requested a Native American Consultation List for the purposes of formal consultation.** Lists for cultural resource assessments are different than consultation lists. Please note that the intent of the referenced codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

**Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:
  - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
  - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and



- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.
2. The results of any archaeological inventory survey that was conducted, including:
    - Any report that may contain site forms, site significance, and suggested mitigation measures.
    - All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code Section 6254.10.
  3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission.
  4. Any ethnographic studies conducted for any area including all or part of the potential APE; and
  5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand will help to facilitate the consultation process.

The results of these searches and surveys should be included in the "Tribal Cultural Resources" section or in a separate subsection of the Cultural Resources section of the environmental document submitted for review. Please reference California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: [gayle.totton@nahc.ca.gov](mailto:gayle.totton@nahc.ca.gov).

Sincerely,



Gayle Totton, M.A., PhD.  
Associate Governmental Program Analyst

**Native American Heritage Commission  
Tribal Contact List  
Orange County  
1/19/2017**

***Gabrieleno Band of Mission  
Indians - Kizh Nation***

Andrew Salas, Chairperson  
P.O. Box 393  
Covina, CA, 91723  
Phone: (626) 926 - 4131  
gabrielenoindians@yahoo.com  
Gabrieleno

***Gabrieleno/Tongva San Gabriel  
Band of Mission Indians***

Anthony Morales, Chairperson  
P.O. Box 693  
San Gabriel, CA, 91778  
Phone: (626)483-3564  
Fax: (626)286-1262  
GTTribalcouncil@aol.com  
Gabrieleno

***Gabrielino /Tongva Nation***

Sandonne Goad, Chairperson  
106 1/2 Judge John Aiso St.,  
#231  
Los Angeles, CA, 90012  
Phone: (951)807-0479  
sgoad@gabrielino-tongva.com  
Gabrielino

***Gabrielino Tongva Indians of  
California Tribal Council***

Robert Dorame, Chairperson  
P.O. Box 490  
Bellflower, CA, 90707  
Phone: (562) 761 - 6417  
Fax: (562) 761-6417  
gtongva@gmail.com  
Gabrielino

***Gabrielino-Tongva Tribe***

Linda Candelaria, Co-Chairperson  
1999 Avenue of the Stars, Suite  
1100  
Los Angeles, CA, 90067  
Phone: (626)676-1184  
Gabrielino

***Juaneno Band of Mission  
Indians***

Sonia Johnston, Chairperson  
P.O. Box 25628  
Santa Ana, CA, 92799  
sonia.johnston@sbcglobal.net  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Belardes***

Matias Belardes, Chairperson  
32161 Avenida Los Amigos  
San Juan Capistrano, CA, 92675  
Phone: (949)293-8522  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Belardes***

Joyce Perry, Tribal Manager  
4955 Paseo Segovia  
Irvine, CA, 92603  
Phone: (949) 293 - 8522  
kaamalam@gmail.com  
Juaneno

***Juaneno Band of Mission  
Indians Acjachemen Nation -  
Romero***

Teresa Romero, Chairperson  
31411-A La Matanza Street  
San Juan Capistrano, CA, 92675  
Phone: (949)488-3484  
Fax: (949)488-3294  
tromero@juaneno.com  
Juaneno

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Fullerton College Facilities Master Plan Project, Orange County.

February 14, 2017

9422.0001

Mr. Matias Belardes, Chairperson  
Juaneno Band of Mission Indians Acjachemen Nation  
32161 Avenida Los Amigos  
San Juan Capistrano, CA 92675

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Belardes:

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As part of the process of identifying cultural resources issues for this proposed project, Dudek contacted the California Native American Heritage Commission (NAHC) to request a Sacred Lands File (SLF) search and a list of Native American individuals and/or tribal organizations who may have knowledge of cultural resources in or near the proposed project site. The SLF search failed to indicate the presence of Native American cultural resources in the immediate project area.

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*Mr. Belardes:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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Thank you for your assistance.

Sincerely,



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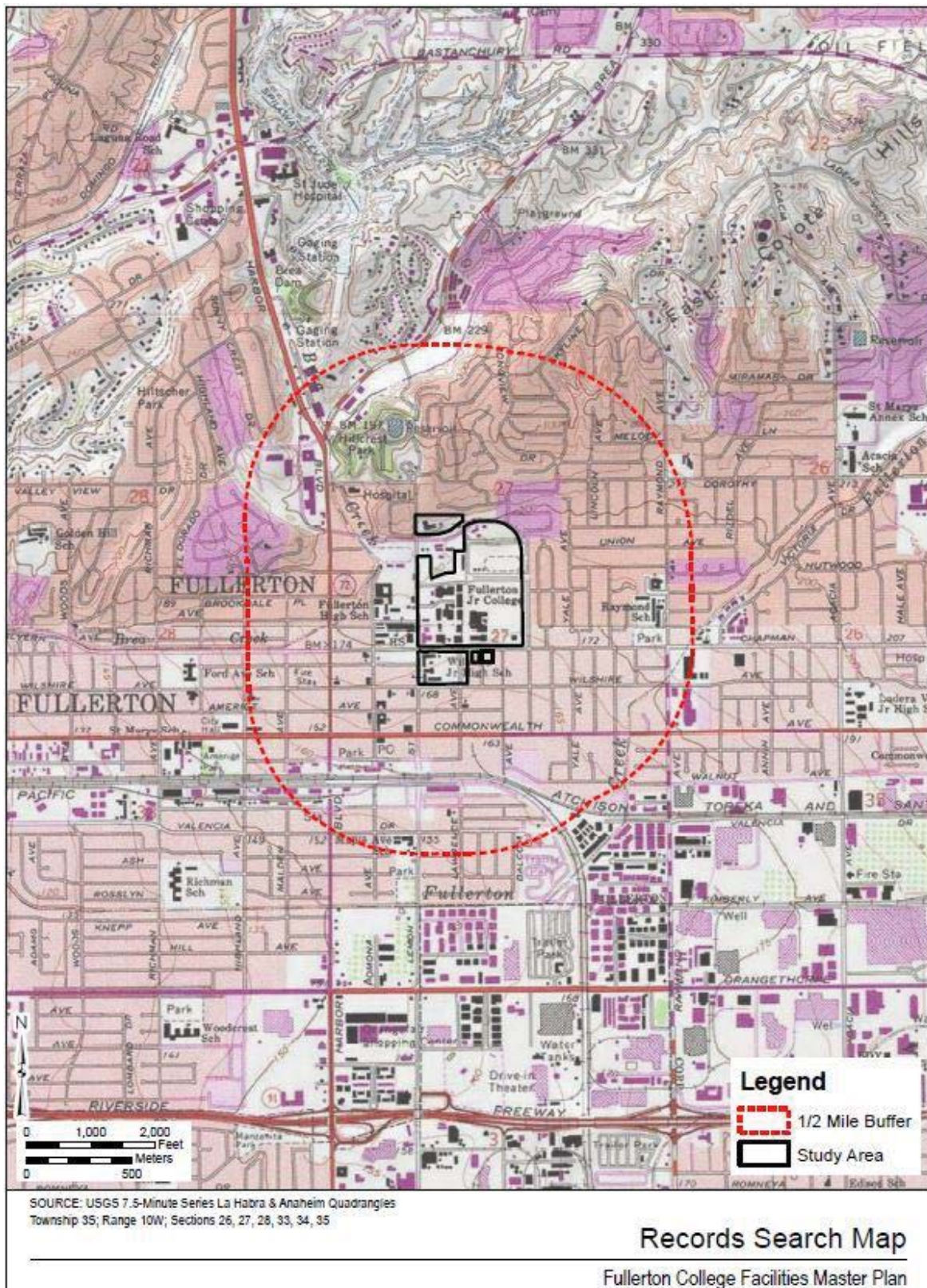
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Mr. Belardes:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Linda Candelaria, Chairwoman  
Gabrielino-Tongva Tribe  
1999 Avenue of the Stars #1100  
Los Angeles, CA 90067

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Candelaria:

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*Ms. Candelaria:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

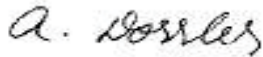
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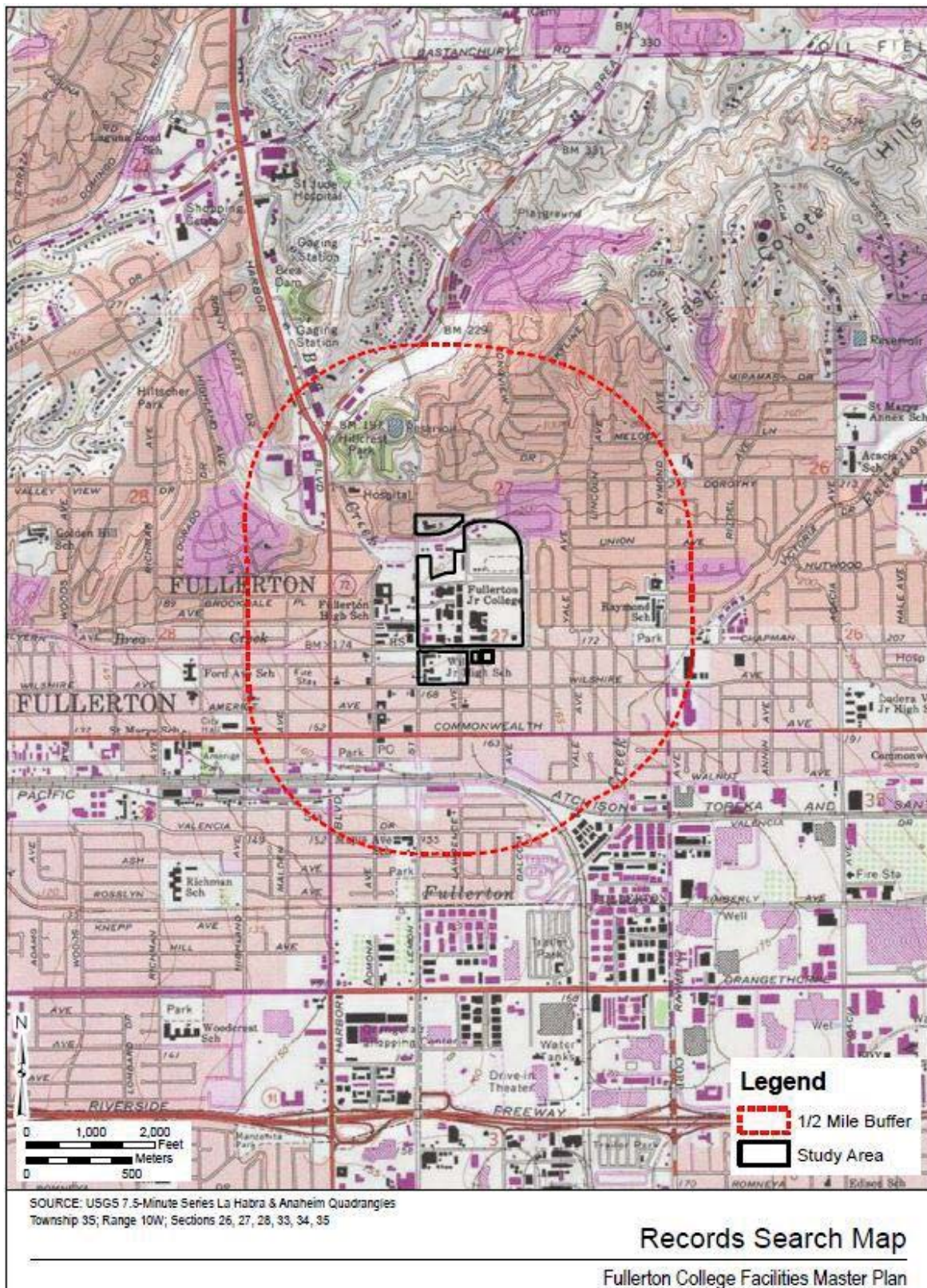
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Ms. Candelaria:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Mr. Robert F. Dorame, Tribal Chair/Cultural Resources  
Gabrielino Tongva Indians of California Tribal Council  
P.O. Box 490  
Bellflower, CA 90707

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Dorame:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Mr. Dorame:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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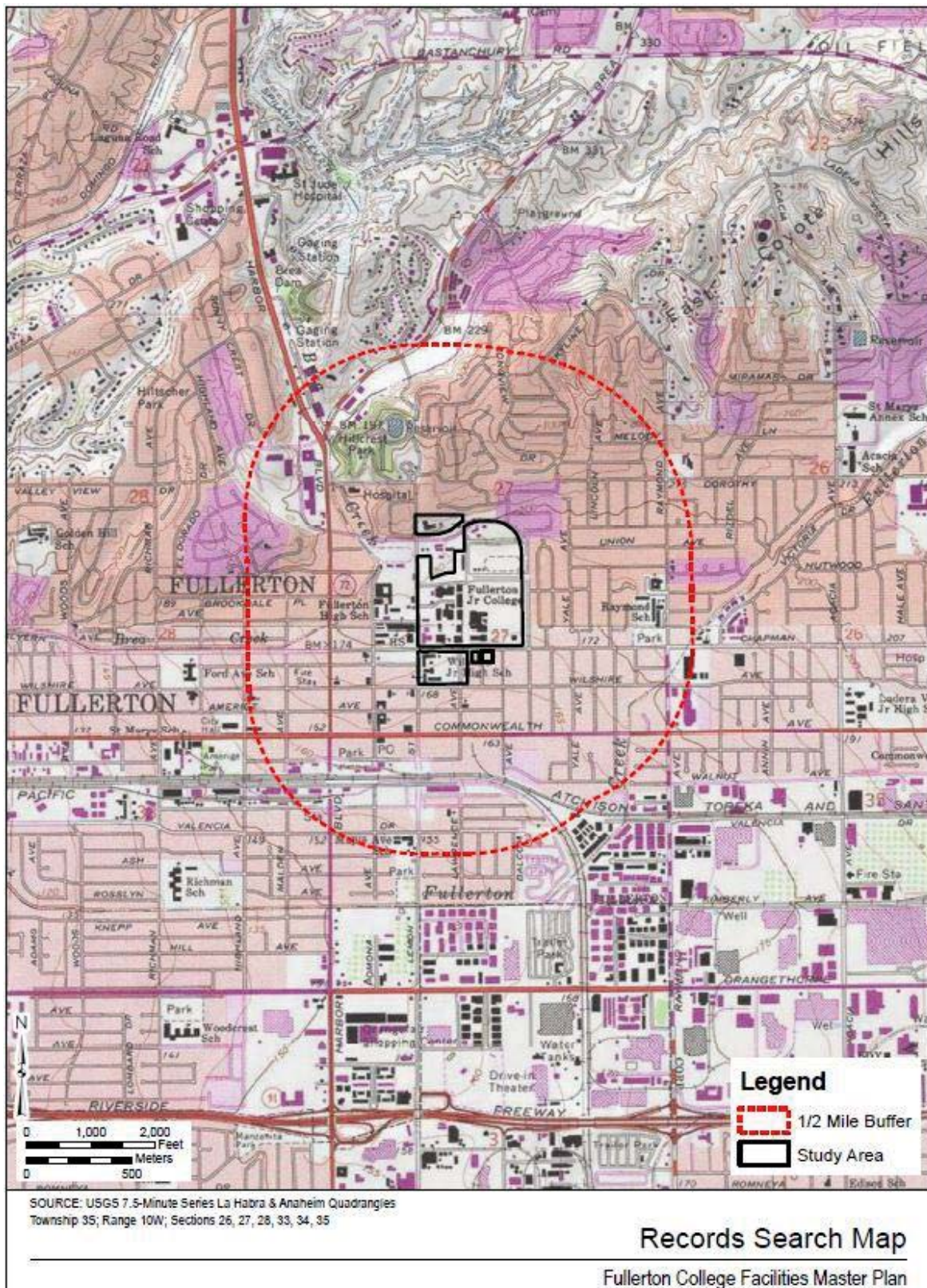
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Adriane Dorrler  
Archaeologist

*Attachment.: Records Search Map*

Mr. Dorame:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Ms. Sandonne Goad, Chairperson  
Gabrielino-Tongva Nation  
106 1/2 Judge John Also St.  
Los Angeles, CA 90012

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Goad:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Ms. Goad:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

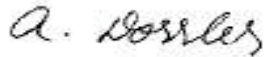
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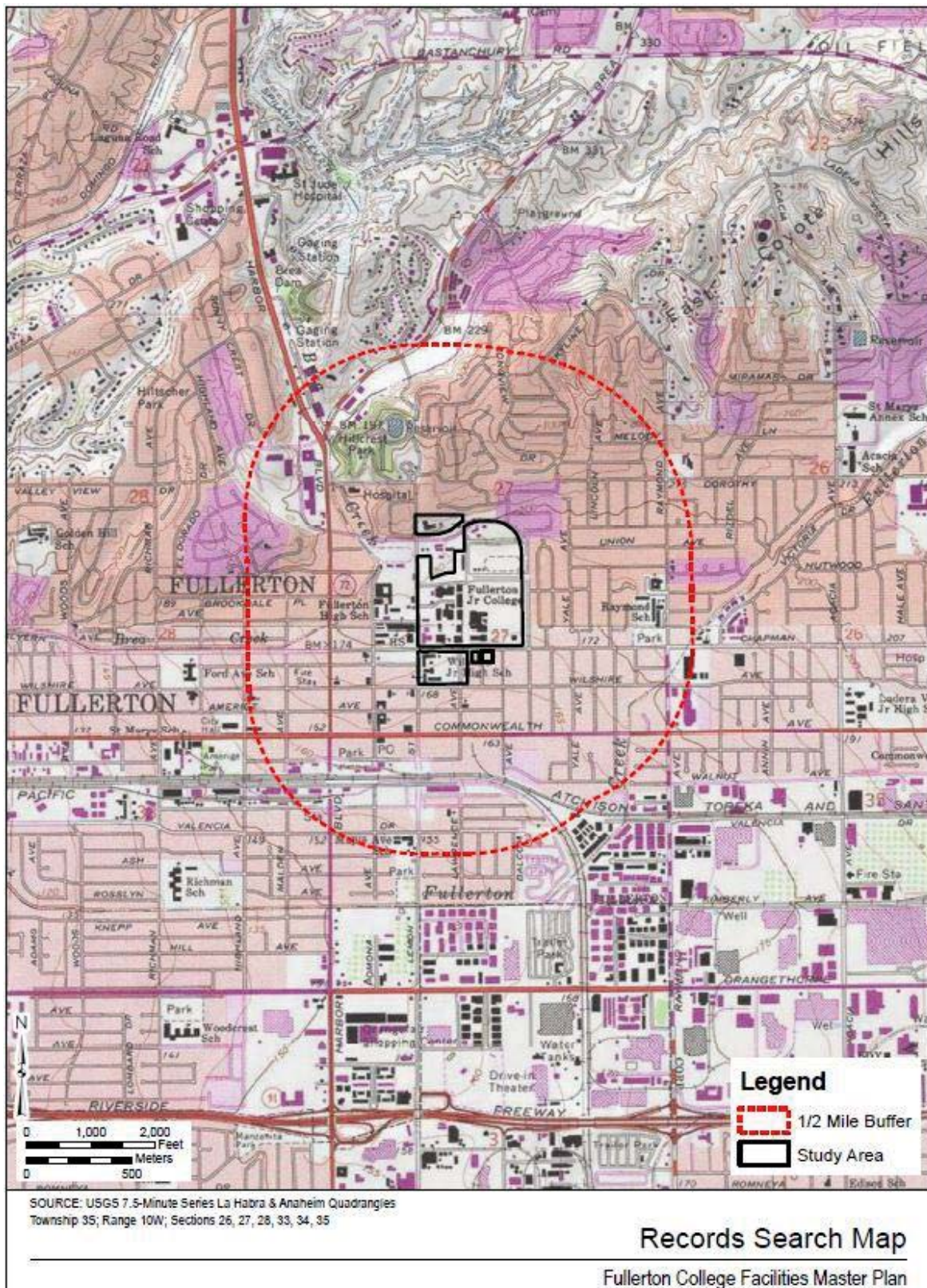
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Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*

Ms. Goad:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California





February 14, 2017

9422.0001

Ms. Sonia Johnston, Tribal Chairperson  
Juaneno Band of Mission Indians  
P.O. Box 25628  
Santa Ana, CA 92799

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Ms. Johnston:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

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*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

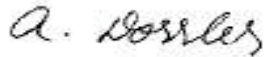
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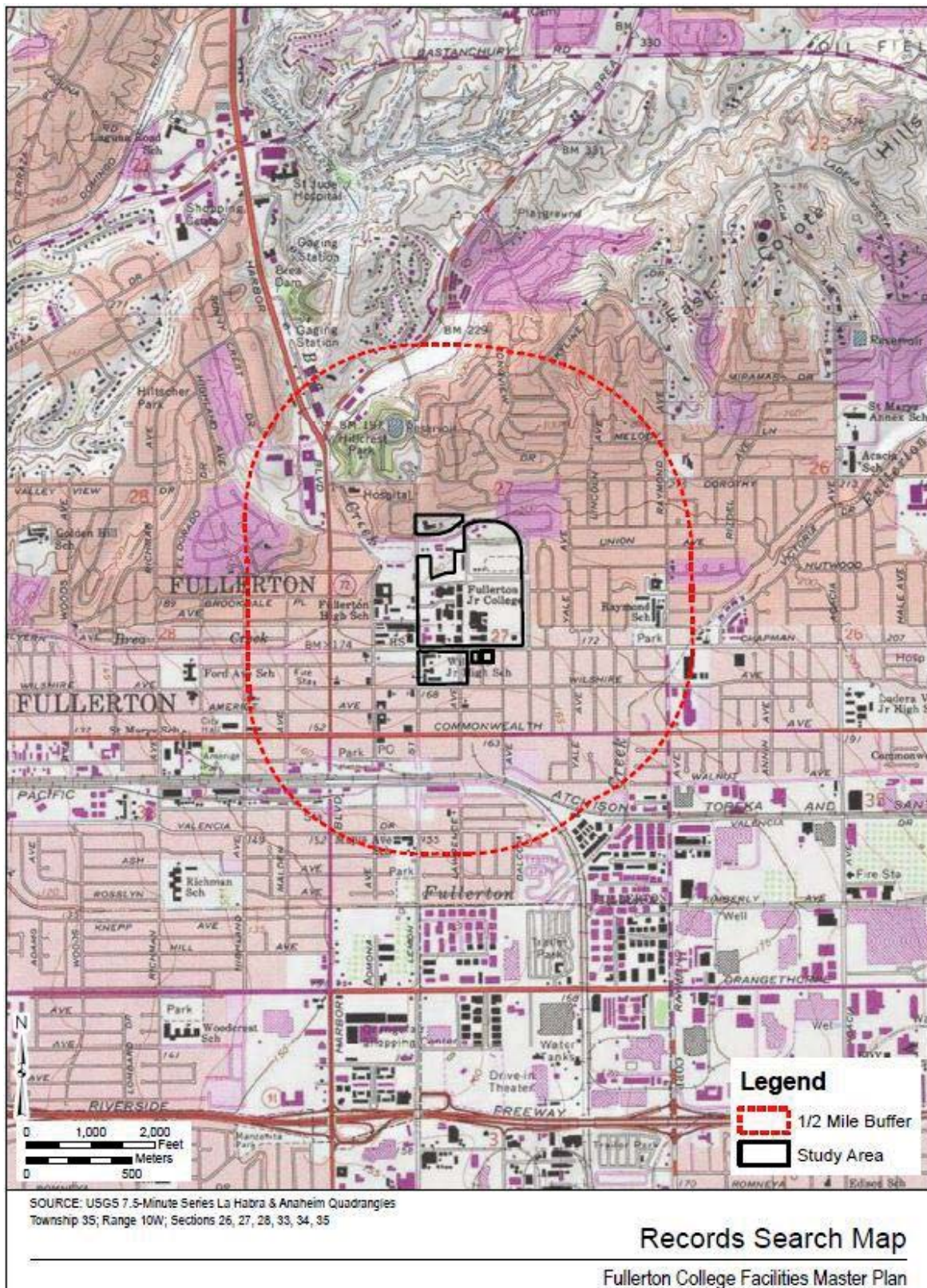
Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*



Ms. Johnston:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Mr. Anthony Morales, Chairperson  
Gabrieleno/Tongva San Gabriel Band of Mission Indians  
P.O. Box 693  
San Gabriel, CA 91778

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Morales:

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*Mr. Morales:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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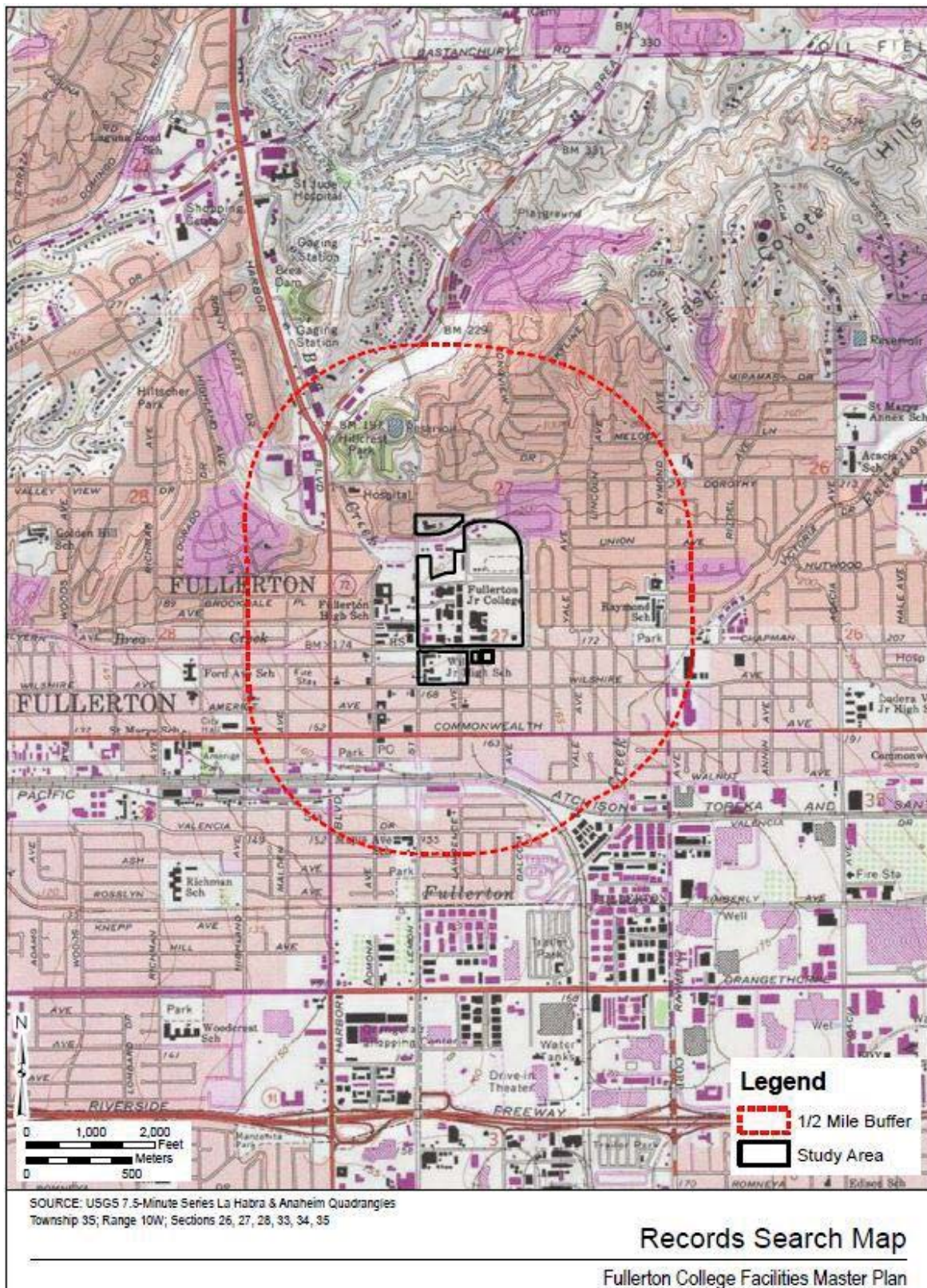
Adriane Dorrlor  
Archaeologist

*Attachment.: Records Search Map*



Mr. Morales:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Joyce Perry, Representing Tribal Chairperson  
Juaneno Band of Mission Indians Acjachemen Nation  
4955 Paseo Segovia  
Irvine, CA 92612

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

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*Ms. Perry:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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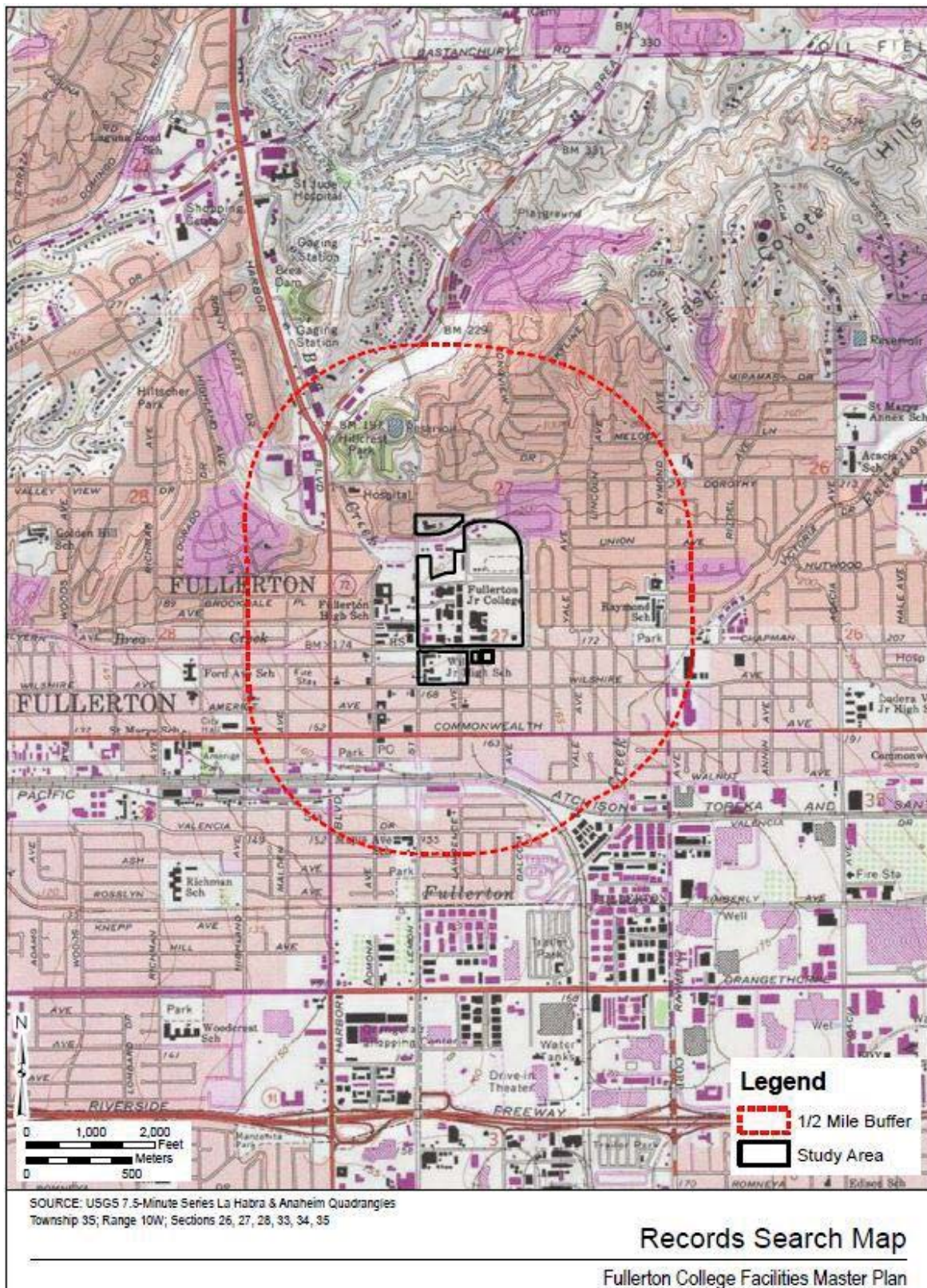
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Archaeologist

*Attachment.: Records Search Map*



Ms. Perry:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Ms. Teresa Romero, Chairwoman  
Juaneno Band of Mission Indians Acjachemen Nation  
31411-A La Matanza Street  
San Juan Capistrano, CA 92675

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

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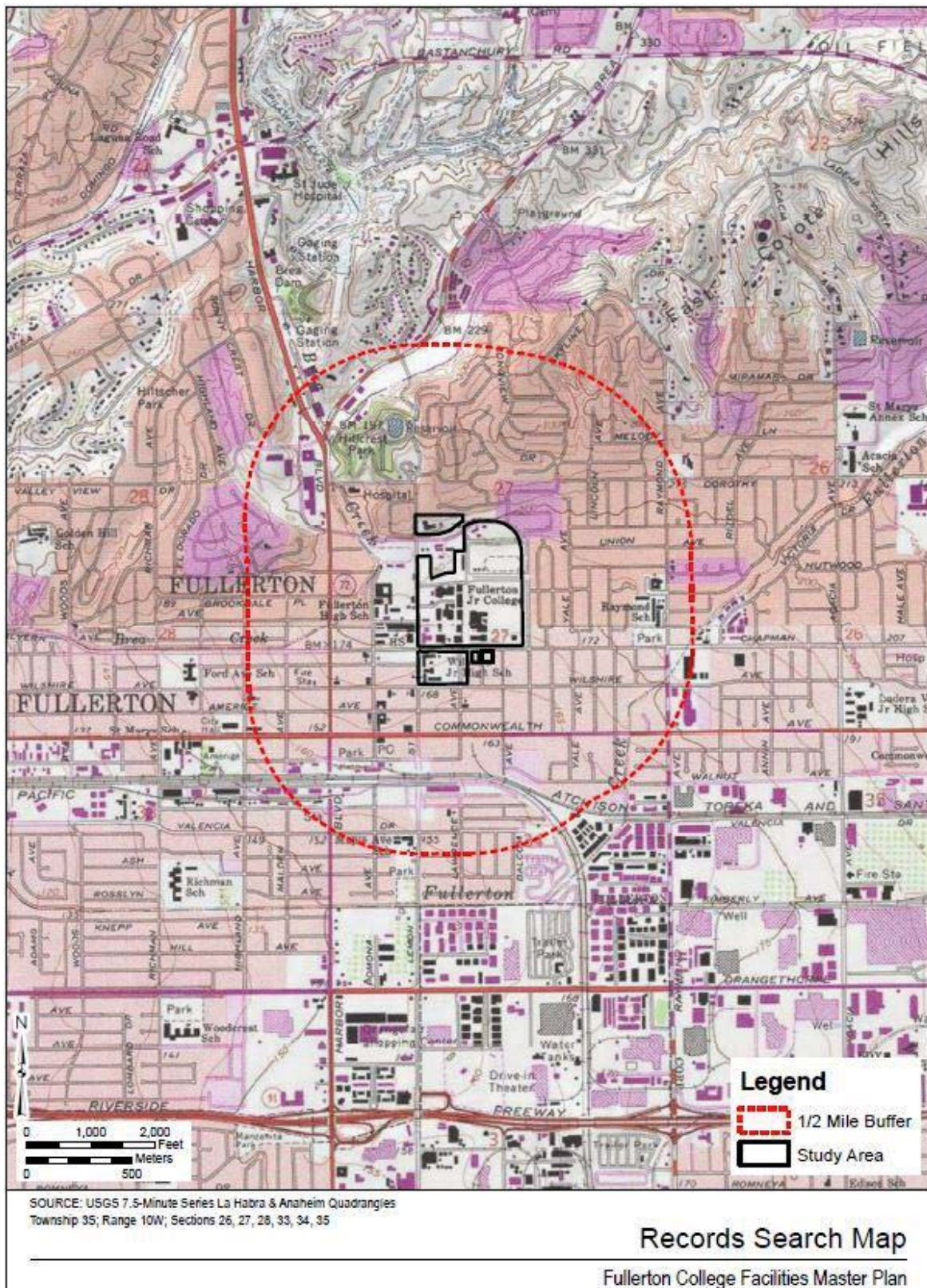
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Archaeologist

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Ms. Romero:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California



February 14, 2017

9422.0001

Mr. Andrew Salas, Chairperson  
Gabrielino Band of Mission Indians  
P.O. Box 393  
Covina, CA 91723

***Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California***

Dear Mr. Salas:

Dudek was retained by the North Orange County Community College District (NOCCCD) to conduct a cultural resources study for the Fullerton College Facilities Master Plan Project (the proposed project). Fullerton College was formed in 1913 and is the District's oldest campus. The NOCCCD is undertaking a comprehensive improvement and building program to make upgrades and repairs of existing buildings as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College in accordance with Measure J. The proposed project involves demolition of certain existing buildings; the renovation of existing buildings; and the construction and eventual operation of new buildings and campus facilities.

Fullerton College is located at 321 E. Chapman Avenue in the City of Fullerton (City) and occupies an approximately 70-acre site in northern Orange County. Specifically, Fullerton College is bounded by residential development to the north, south, and east and Fullerton Union High School to the west. The project area falls within Section 27 of Township 3 South, Range 10 West of the USGS 7.5-Minute *Anaheim* and *La Habra* Quadrangles (see attached map).

As part of the process of identifying cultural resources issues for this proposed project, Dudek contacted the California Native American Heritage Commission (NAHC) to request a Sacred Lands File (SLF) search and a list of Native American individuals and/or tribal organizations who may have knowledge of cultural resources in or near the proposed project site. The SLF search failed to indicate the presence of Native American cultural resources in the immediate project area.

A California Historical Resources Information System (CHRIS) records search was conducted for the proposed project site and a one-half-mile radius at the South Central Coastal Information Center (SCCIC). The SCCIC has no record of prehistoric or historic archaeological sites within the proposed project site. There is one previously recorded prehistoric resource approximately one-half-mile southwest of the proposed project site.



*Mr. Salas:*

*Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California*

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The NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by this project. If you have any knowledge of cultural resources that may exist within or near the proposed project site, please contact me directly at (760) 840-7556, [adorrler@dudek.com](mailto:adorrler@dudek.com), or at 3544 University Avenue, Riverside, CA 92501 within 15 days of receipt of this letter.

Please note that this letter does not constitute Assembly Bill (AB) 52 notification or initiation of consultation. AB 52 is a process between the lead agency and California Native American Tribes concerning potential impacts to tribal cultural resources. Tribes that wish to be notified of projects for the purposes of AB 52 must contact the lead agency, the NOCCCD, in writing (pursuant to Public Resources Code Section 21080.3.1 (b)).

Thank you for your assistance.

Sincerely,



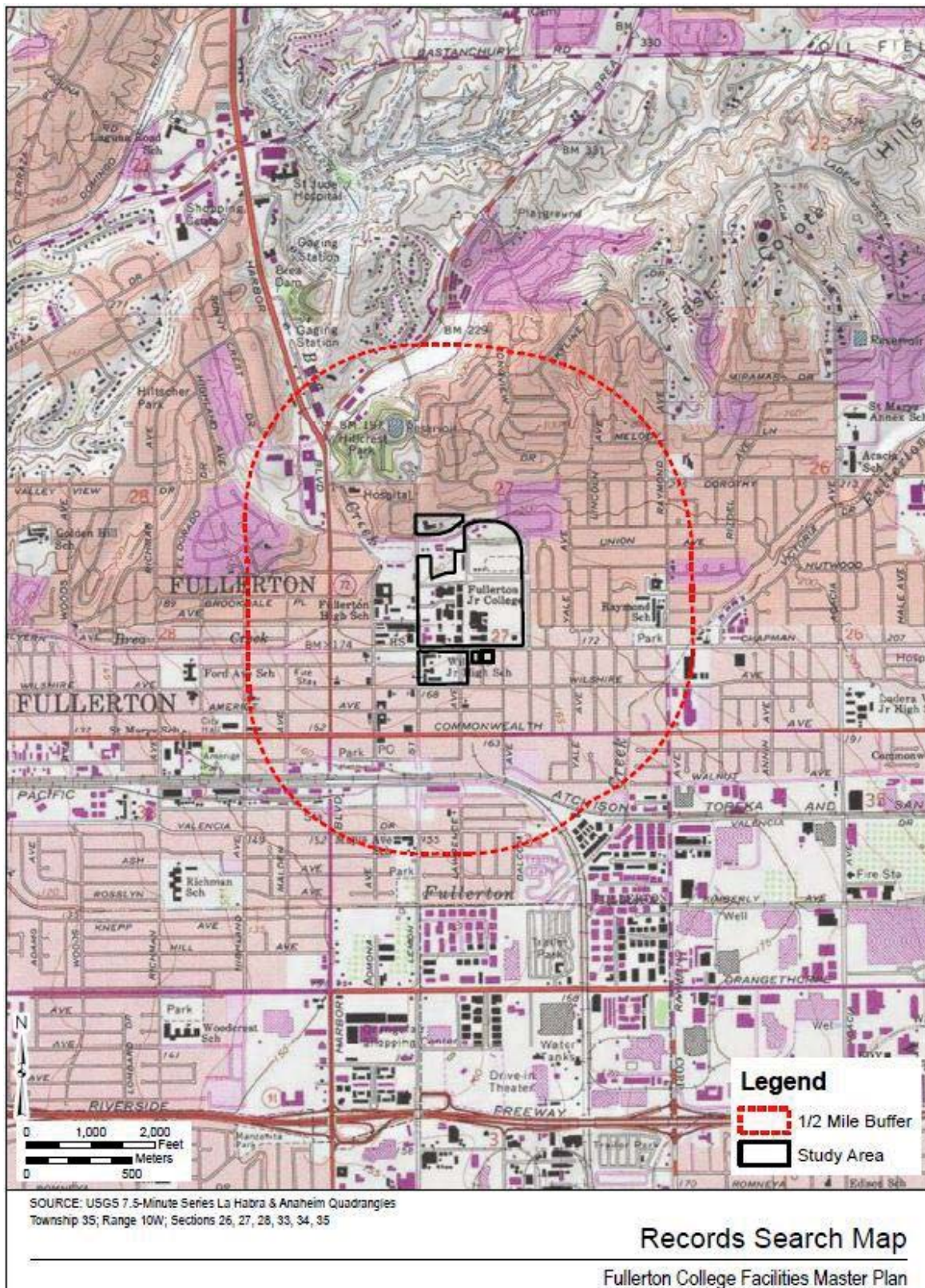
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Adriane Dorrlar  
Archaeologist

*Attachment.: Records Search Map*

Mr. Salas:

Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California







## GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION

Historically known as The San Gabriel Band of Mission Indians  
Recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Dear Adrienne Dorrlor,

**Subject: Fullerton College Facilities Master Plan Project, City of Fullerton, Orange County, California**

"The project locale lies in an area where the Ancestral & traditional territories of the Kizh(Kitc) Gabrieleño villages adjoined and overlapped with each other, at least during the Late Prehistoric and Protohistoric Periods. The homeland of the Kizh (Kitc) Gabrieleños , probably the most influential Native American group in aboriginal southern California (Bean and Smith 1978a:538), was centered in the Los Angeles Basin, and reached as far east as the San Bernardino-Riverside area. The homeland of the Serranos was primarily the San Bernardino Mountains, including the slopes and lowlands on the north and south flanks. Whatever the linguistic affiliation, Native Americans in and around the project area exhibited similar organization and resource procurement strategies. Villages were based on clan or lineage groups. Their home/ base sites are marked by midden deposits, often with bedrock mortars. During their seasonal rounds to exploit plant resources, small groups would migrate within their traditional territory in search of specific plants and animals. Their gathering strategies often left behind signs of special use sites, usually grinding slicks on bedrock boulders, at the locations of the resources. Therefore, in order to protect our resources we're requesting one of our experienced & certified Native American monitor and an Professional Archeologist- Monitor to be on site during any & all ground disturbances (this includes but is not limited to pavement removal, pot-holing, or grubbing, auguring, boring, grading, excavation and trenching).

In all cases, when the NAHC states there are "No" records of sacred sites" in the subject area; they always refer the contractors back to the Native American Tribes whose tribal territory the project area is in. This is due to the fact, that the NAHC is only aware of general information on each California NA Tribe they are "NOT" the "experts" on our Tribe. Our Elder Committee & Tribal Historians are the experts and is the reason why the NAHC will always refer contractors to the local tribes.

In addition, we are also often told that an area has been previously developed or disturbed and thus there are no concerns for cultural resources and thus minimal impacts would be expected. I have two major recent examples of how similar statements on other projects were proven very inadequate. An archaeological study claimed there would be no impacts to an area adjacent to the Plaza Church at Olvera Street, the original Spanish settlement of Los Angeles, now in downtown Los Angeles. In fact, this site was the Gabrieleno village of Yangna long before it became what it is now today. The new development wrongfully began their construction and they, in the process, dug up and desecrated 118 burials. The area that was dismissed as culturally sensitive was in fact the First Cemetery of Los Angeles where it had been well documented at the Huntington Library that 400 of our Tribe's ancestors were buried there along with the founding families of Los Angeles (Pico's, Sepulveda's, and Alvarado's to name a few). In addition, there was another inappropriate study for the development of a new sports complex at Fedde Middle School in the City of Hawaiian Gardens could commence. Again, a village and burial site were desecrated despite their mitigation measures. Thankfully, we were able to work alongside the school district to quickly and respectfully mitigate a mutually beneficial resolution.

Given all the above, the proper thing to do for your project would be for our Tribe to monitor ground disturbing construction work. Native American monitors and/or consultant can see that cultural resources are treated appropriately from the Native American point of view. Because we are the lineal descendants of the vast area of Los Angeles and Orange Counties, we hold sacred the ability to protect what little of our culture remains. We thank you for taking seriously your role and responsibility in assisting us in preserving our culture.

With respect,

Please contact our office regarding this project to coordinate a Native American Monitor to be present. Thank You

Andrew Salas, Chairman  
Cell (626) 926-4131

Andrew Salas, Chairman  
Albert Perez, treasurer I

Nadine Salas, Vice-Chairman  
Martha Gonzalez Lemos, treasurer II

Christina Swindall Martinez, secretary  
Richard Gradias, Chairman of the council of Elders

Addendum: clarification regarding some confusions regarding consultation under AB52:

AB52 clearly states that consultation must occur with tribes that claim traditional and cultural affiliation with a project site. Unfortunately, this statement has been left open to interpretation so much that neighboring tribes are claiming affiliation with projects well outside their traditional tribal territory. The territories of our surrounding Native American tribes such as the Luiseno, Chumash, and Cahuilla tribal entities. Each of our tribal territories has been well defined by historians, ethnographers, archaeologists, and ethnographers – a list of resources we can provide upon request. Often, each Tribe as well educates the public on their very own website as to the definition of their tribal boundaries. You may have received a consultation request from another Tribe. However we are responding because your project site lies within our Ancestral tribal territory, which, again, has been well documented. What does Ancestrally or Ancestral mean? The people who were in your family in past times, Of, belonging to, inherited from, or denoting an ancestor or ancestors <http://www.thefreedictionary.com/ancestral>. . If you have questions regarding the validity of the “traditional and cultural affiliation” of another Tribe, we urge you to contact the Native American Heritage Commission directly. Section 5 section 21080.3.1 (c) states “...the Native American Heritage Commission shall assist the lead agency in identifying the California Native American tribes that are traditionally and culturally affiliated with the project area.” In addition, **please see the map below.**

CC: NAHC

APPENDIX 1: Map 1-2; Bean and Smith 1978 map.

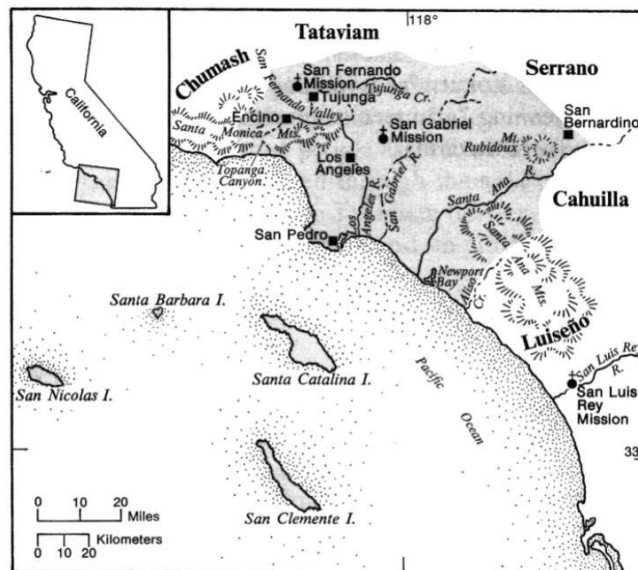


Fig. 1. Tribal territory.

The United States National Museum's Map of Gabrielino Territory:

Bean, Lowell John and Charles R. Smith  
1978 Gabrielino IN *Handbook of North American Indians, California*, Vol. 8, edited by R.F. Heizer, Smithsonian Institution Press, Washington, D.C., pp. 538-549

Andrew Salas, Chairman

Albert Perez, treasurer I

Nadine Salas, Vice-Chairman

Martha Gonzalez Lemos, treasurer II

Christina Swindall Martinez, secretary

Richard Gradias, Chairman of the council of Elders

# **APPENDIX C**

## *Preparers' Qualifications*





# Samantha Murray, MA

## Senior Architectural Historian and Built Environment Lead

Samantha Murray is a senior architectural historian with 12 years' professional experience in all elements of cultural resources management, including project management, intensive-level field investigations, architectural history studies, and historical significance evaluations in consideration of the California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), and local-level evaluation criteria. Ms. Murray has conducted hundreds of historical resource evaluations and developed detailed historic context statements for a multitude of property types and architectural styles, including private residential, commercial, industrial, educational, medical, ranching, mining, airport, and cemetery properties, as well as a variety of engineering structures and objects. She has also provided expertise on numerous projects requiring conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

### EDUCATION

California State University, Los Angeles  
MA, Anthropology, 2013

California State University, Northridge  
BA, Anthropology, 2003

### PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Society of Architectural Historians

National Trust for Historic Preservation

Ms. Murray meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Archaeology. She is experienced managing multidisciplinary projects in the lines of transportation, transmission and generation, federal land management, land development, state and local government, and the private sector. She has experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). She also prepared numerous Historic Resources Evaluation Reports (HRERs) and Historic Property Survey Reports (HPSRs) for the California Department of Transportation (Caltrans).

## Dudek Project Experience (2014-2017)

### Development

**Yosemite Avenue-Gardner Avenue to Hatch Road Annexation Project, City of Merced, Merced County, California.** Ms. Murray managed and reviewed the historic resource significance evaluation of a single-family residence/agricultural property within the proposed project site. The evaluation found the property not eligible under all NRHP and CRHR designation criteria. The project proposes to annex 70 acres from Merced County to the City of Merced and to construct and operate the University Village Merced Student Housing and Commercial component on an approximately 30-acre portion of the project site. No development is proposed on the remaining 40 acres.

**Schouten House Property Evaluation, California State University, Chico Research Foundation, Butte County, California.** Ms. Murray prepared a historic resource evaluation report and DPR form for a former single-family residence located at 2979 Hegan Lane in Butte County, California, in consideration of CRHR and local level eligibility criteria and integrity requirements. The University Research Foundation was proposing demolition of the property.

**Avenidas Expansion Project, City of Palo Alto, Santa Clara County, California.** Ms. Murray peer reviewed a historical resource evaluation report for the property at 450 Bryant Street. The peer review assessed the report's adequacy as an evaluation in consideration of state and local eligibility criteria and assessed the project's conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Robertson Lane Hotel Commercial Redevelopment Project, City of West Hollywood, California.** Ms. Murray is currently serving as architectural historian and peer reviewer of the historical evaluation report. The project involved conducting a records search, archival research, consultation with local historical groups, preparation of a detailed historic context statement, evaluation of three buildings proposed for demolition in consideration of local, CRHR, and NRHP designation criteria, and assistance with the EIR alternatives analysis.

**Rocketship Senter Road Public Elementary School Project, City of San Jose, Santa Clara County, California.** Ms. Murray served as architectural historian and prepared a historic resource evaluation report in compliance with the City of San Jose's historic preservation ordinance. Ms. Murray evaluated a 1960s church building in consideration of NRHP, CRHR, and local designation criteria and integrity requirements.

**Jack in the Box Drive Through Restaurant Project, City of Downey, Los Angeles County, California.** Ms. Murray served as architectural historian and lead author of the cultural resources study which included evaluation of two historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a records search, survey, and Native American Coordination.

**San Carlos Library Historical Resource Technical Report, City of San Diego, California.** Ms. Murray served as architectural historian and author of the Historical Resource Technical Report for the San Carlos Library. Preparation of the report involved conducting extensive building development and archival research on the library building, development of a historic context, and a historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements. The project proposes to build a new, larger library building.

**Historical Evaluation of 3877 El Camino Real, City of Palo Alto, California.** Ms. Murray served as architectural historian, originally providing a peer review of another consultant's evaluation. The City then asked Dudek to re-do the original evaluation report. As part of this work Ms. Murray conducted additional archival research on the property and evaluated the building for historical significance in consideration of local, state, and national designation criteria and integrity requirements. The project proposes to demolish the existing building and develop new housing.

**429 University Avenue Historic Resources Evaluation Report Peer Review, City of Palo Alto, California.** Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations, and is currently working on additional building studies for the City of Palo Alto.

**1050 Page Mill Road Historic Resources Evaluation Report Peer Review, City of Palo Alto, Santa Clara County, California.** Ms. Murray conducted a peer review of a study prepared by another consultant, and provided a memorandum summarizing the review, comments, and recommendations.

**Big Chico Creek Ecological Reserve (BCCER) Henning Property Historical Evaluation, California State University, Chico, California.** Ms. Murray authored the historical significance evaluation report for a property located at 3521 14 Mile House Road as requested by the California State University Chico Research Foundation. The property is historically known as the Henning Property and has served as the BCCER conference center in recent years. The Foundation is considering demolition of the existing property due to numerous safety concerns and the high cost associated with bringing the building up to current code requirements.

**635 S. Citrus Avenue Proposed Car Dealership MND, City of Covina, California.** Ms. Murray served as architectural historian and archaeologist, and author of the cultural resources MND section. The project proposes to convert an existing Enterprise Rent-a-Car facility into a car dealership. As part of the MND section, Ms. Murray conducted a records search, Native American coordination, background research, building permit research, and a historical significance evaluation of the property. The study resulted in a finding of less-than-significant impacts to cultural resources.

**8228 Sunset Boulevard Tall Wall Project, City of West Hollywood, California.** Ms. Murray prepared DPR forms and conducted building development and archival research to evaluate a historic-age office building. The project proposes to install a tall wall sign on the east side of the building.

**Historic Resource Evaluation of 8572 Cherokee Drive, City of Downey, California.** Ms. Murray served as architectural historian and project manager. She prepared a historical resource evaluation report and a set of DPR forms to evaluate a partially demolished residence that was previously determined eligible for inclusion in the NRHP (known as the Al Ball House). The current owner is proposing to subdivide the lot and develop four new homes.

**Montclair Plaza Expansion Project, City of Montclair, California.** Resources MND section, which included an evaluation of several department store buildings proposed for demolition. The project proposes to expand the existing Montclair Plaza Shopping Center.

**Foothill 533 IS/MND, City Ventures, City of Glendora, California.** Ms. Murray served as architectural historian, archaeologist, and author of the cultural resources IS/MND section. As part of the cultural study, Ms. Murray recorded and evaluated five historic-age commercial/industrial properties proposed for demolition as part of the project. The project proposes to develop a series of new townhomes.

**Normal Street Project, City of San Diego, California.** Ms. Murray served as architectural historian and co-author of the Historical Resources Technical Report for properties located at 3921-3923; 3925-3927; 3935 Normal Street for the City of San Diego's Development Services Department. Ms. Murray assisted with the final round of comments from the City and wrote the historical significance evaluations for all properties included in the project.

## Education

**Kings Beach Elementary School Modernization Project, Tahoe Truckee Unified School District, Tahoe City, Placer County, California.** Ms. Murray served as architectural historian and co-author of the cultural resources study. The study involved evaluation of the existing school for NRHP, CRHR and local eligibility, conducting archival and building development research, a records search, and Native American coordination.

**Cypress College Facilities Master Plan Program EIR, City of Cypress, Orange County, California.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Cypress College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray authored the cultural resources study for the project, which included a significance evaluation of all 1960s and 1970s buildings on campus proposed for demolition or renovation. As a result of the significance evaluation, including consideration of CRHR evaluation criteria and integrity requirements, the original 1960s–1970s campus appears to be eligible as a historic district under CRHR Criterion 3 for conveying a concentration of planned buildings, structures, and associated elements united aesthetically by their embodiment of the Brutalist style. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Tahoe Lake Elementary School Facilities Master Plan Project, Tahoe Truckee Unified School District, Tahoe City, Placer County, California.** Ms. Murray served as architectural historian and lead author of the cultural resources study. She recorded and evaluated the Tahoe Lake Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

**San Diego State University (SDSU) Open Air Theater Renovation Project, SDSU and Gatzke Dillon & Balance, LLP, San Diego, California.** Ms. Murray served as architectural historian and prepared a technical memorandum that analyzed the project's potential to impact the OAT theater (a contributing property to the San Diego State College NRHP Historic District). This included conducting a site visit, reviewing proposed site and design plans, and preparing a memorandum analyzing the project's conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

**Mt. San Jacinto College (MSJC) Master Plan Project, City of San Jacinto, Riverside County, California.** Ms. Murray served as architectural historian, archaeologist, and lead author of the cultural resources study. As part of the study she evaluated 11 buildings for NRHP, CRHR, and local level criteria and integrity requirements. The buildings were constructed prior to 1970 and proposed for demolition as part of the project. The study also entailed conducting extensive archival and building development research at District offices, a records search, and Native American coordination.

**San Diego State University (SDSU) Engineering and Sciences Facilities Project, SDSU and Gatzke Dillon & Balance, LLP, San Diego, California.** Ms. Murray served architectural historian, archaeologist, and lead author of the Cultural Resources Technical Report for the SDSU Engineering and Interdisciplinary Sciences Building Project. The project required evaluation of 5 historic-age buildings in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, an intensive level survey, Native American coordination, and a records search. The project proposes to demolish four buildings and alter a fifth as part of the university's plan to update its engineering and science facilities.

**Fullerton College Facilities Master Plan Program EIR, North Orange County Community College District, City of Fullerton, Orange County, California. 2017.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray co-authored and oversaw the cultural resources study. All buildings and structures on campus over 45 years old and/or or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA. As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**The Cove: 5th Avenue Chula Vista Project, E2 ManageTech Inc., San Diego, California.** Ms. Murray served as architectural historian and co-author of the CEQA report. The project involved recordation and evaluation of several properties functioning as part of the Sweetwater Union High School District administration facility, proposed for redevelopment, as well as an archaeological survey of the project area.

## Energy

**J-135I Electrical Distribution and Substation Improvements and J-600 San Dieguito Pump Station Replacement Project, Santa Fe Irrigation, San Diego County, California.** Ms. Murray served as architectural historian and prepared the Department of Parks and Recreation (DPR) forms and associated memo concerning replacement of the original 1964 San Dieguito Pump Station. Ms. Murray recorded and evaluated the pump house for state and local significance and integrity considerations. As part of this effort she conducted background research, prepared a brief historic context, and a significance evaluation.

## Expert Witness

**Robert Salamone vs. The City of Whittier.** Ms. Murray was retained by the City of Whittier to serve as an expert witness for the defense. She peer reviewed a historic resource evaluation prepared by another consultant and provided expert testimony regarding the contents and findings of that report as well as historic resource requirements on a local and state level in

consideration of the City of Whittier's Municipal Code Section 18.84 and CEQA. Judgement was awarded in favor of the City on all counts.

### Healthcare

**Hamilton Hospital Residential Care Facility Project, City of Novato, Marin County, California.** Ms. Murray served as architectural historian, prepared a cultural resources study, and assessed the proposed project's design plans for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The project proposed to construct an addition and make alterations to an NRHP-listed district contributing property. With review from Ms. Murray, the project was able to demonstrate conformance with the Standards for Rehabilitation.

**Culver Place Assisted Living Project, DJB Architects, Culver City, California.** Ms. Murray served as architectural historian, archaeologist, and author of the Letter Report for a Cultural and Paleontological Resources Study. Ms. Murray conducted the intensive-level cultural resources survey of the project area, conducted background research, and coordinated with local Native American groups. The project proposes to construct an assisted living facility on a large private property in Culver City.

### Transportation

**SR-86 and Neckel Road Intersection Improvements and New Traffic Signal Light Project, Caltrans, City of Imperial, California.** Ms. Murray served as Principal Architectural Historian, and author of the HPSR and Finding of No Adverse Effect document. The project involved an intensive field survey, Native American and historic group coordination, a records search, and recordation and NRHP and CRHR evaluation of two historic drainage canals proposed for improvement as part of Caltrans intersection improvement project. All documents were signed and approved by Caltrans District 11 and the Caltrans Cultural Studies Office.

**California Boulevard Roundabout Project, OmniMeans, City of Napa, California.** Ms. Murray served as Principal Architectural Historian and Archaeologist, preparing of the Area of Potential Effects (APE) map and subsequent preparation of Caltrans documentation, including an Archaeological Survey Report (ASR), HRER, HPSR, and a Finding of No Adverse Effect with Standard Conditions. The HRER included an evaluation of 7 previously unrecorded properties for the NRHP and CRHR. The project proposes to modify and install a roundabout at California Boulevard and First Street in the City of Napa. All documents were signed and approved by Caltrans District 4 and the Caltrans Cultural Studies Office.

### Water/Wastewater

**Morena Reservoir Outlet Tower Replacement Project, City of San Diego, California.** Ms. Murray evaluated the 1912 Morena Dam and Outlet Tower for NRHP, CRHR, and local level eligibility and integrity requirements. The project entailed conducting extensive archival research and development research at City archives, libraries, and historical societies, and preparation of a detailed historic context statement on the history of water development in San Diego County.



**69<sup>th</sup> and Mohawk Pump Station Project, City of San Diego, California.** Ms. Murray served as architectural historian and lead author of the Historical Resource Technical Report for the pump station building on 69th and Mohawk Street. Preparation of the report involves conducting extensive building development and archival research on the pump station building, development of a historic context, and a historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements.

**Pump Station No. 2 Power Reliability and Surge Protection Project, City of San Diego, California.** Ms. Murray served as architectural historian and prepared an addendum to the existing cultural resources report in order to evaluate the Pump Station No. 2 property for NRHP, CRHR, and local level eligibility and integrity requirements. This entailed conducting additional background research, building development research, a supplemental survey, and preparation of a historic context statement.

**Orange County Central Utility Facility Upgrade, County of Orange Public Works, City of Santa Ana, Orange County, California.** To further the County's long-term goals of operational safety, improved efficiency, cost effectiveness, and supporting future campus development plans, the proposed Central Utility Facility Upgrade project consisted of improvements and equipment replacements recommended by the Strategic Development Plan for the CUF's original utility systems. Ms. Murray served as architectural historian and archaeologist, and prepared the cultural resources MND section. As part of this effort Ms. Murray conducted a detailed review of historic resource issues within and around the proposed project area to assess potential impacts to historic buildings and structures. The proposed project involved improvements to 16 buildings located within the Civic Center Campus. As a result of the cultural resources analysis, it was determined that the proposed project would not result in a substantial adverse change to any of the historic-age buildings or the associated Civic Center Plaza walkways/landscaping.

**Bear River Restoration at Rollins Reservoir Project, Nevada Irrigation District, Nevada and Placer Counties, California.** Ms. Murray served as architectural historian and co-author of the Cultural Resources Inventory Report. Ms. Murray conducted background research on the 1963 Chicago Park Powerhouse Bridge and prepared a historic context for the Little York Township and Secret Town Mine.

**Otay River Estuary Restoration Project (ORERP), Poseidon Resources, South San Diego Bay, California.** Ms. Murray served as architectural historian for the documentation of Pond 15 and its associated levees. The project proposes to create new estuarine, salt marsh, and upland transition habitat from the existing salt ponds currently being used by the South Bay Salt Works salt mining facility. Because the facility was determined eligible for listing in the NRHP, the potential impacts caused by breaching the levees, a contributing feature of the property, had to be assessed.

## **Other Project Experience (2008-2014)**

**LADPW BOE Gaffey Pool and Bathhouse Project, Los Angeles County, California (2014).** Ms. Murray served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. Ms. Murray reviewed proposed design plans for new construction within an NRHP-listed historic district for conformance with the Secretary of the Interior's Standards. The LADPW BOE proposed to



conduct various improvements to the Gaffey Street Pool and surrounding area, located in Upper Reservation of Fort McArthur in San Pedro, California.

**Metro Green Line to LAX Project (2013-2014).** Ms. Murray served as project manager for a multi-disciplinary project that includes cultural resources, biology, and paleontology. The Los Angeles County Metropolitan Transportation Authority (Metro), Federal Transit Administration (FTA), Federal Aviation Administration (FAA) and Los Angeles World Airports (LAWA) have initiated an Alternatives Analysis (AA)/Draft EIS/Draft EIR for the Metro Green Line to Los Angeles International Airport (LAX) project. The AA/DEIS/DEIR is being prepared to comply with NEPA and CEQA. This study will examine potential connections between the planned Metro Crenshaw / LAX Transit Corridor Project's Aviation/Century Station and the LAX Central Terminal Area (CTA) located approximately one mile to the west. Client: Terry Hayes Associates.

**LADPW BOE Downtown Cesar Chavez Median Project, Los Angeles County, California (2013).** Ms. Murray served as field director for the intensive-level cultural resources survey, and co-author of the Caltrans ASR and HRER. The City of Los Angeles Department of Public Works (LAPDW), Bureau of Engineering (BOE), proposes to provide for transportation enhancements along West Cesar Chavez Boulevard in the downtown area of Los Angeles. Client: LADPW BOE, Lead Agency: Caltrans, District 7.

**Edwards Air Force Base Historic Context and Survey, Multiple Counties, California (2013).** Ms. Murray served as lead architectural historian and project manager for survey and evaluation of 17 buildings and structures located throughout the base, and preparation of a Cold War historic context statement, an analysis of property types, and registration requirements for all built environment resources on base. Client: JT3/CH2M Hill.

**San Gabriel Trench Grade Separation Project (Phases I, II, and III); Cities of San Gabriel, Alhambra, and Rosemead, Los Angeles County, California (2008–2010, 2011–2014).** Ms. Murray served as Archaeologist, Architectural Historian, and Osteologist throughout various stages of the project. The project consisted of conducting a cultural resources assessment for a proposed grade separation located within the cities of San Gabriel, Alhambra, and Rosemead. The proposed project would lower a 2.2 mile section of Union Pacific Railroad tracks in the immediate vicinity of the historic Mission San Gabriel Arcángel. Ms. Murray was involved in both the archaeological and architectural history components of this project. This includes the archaeological and architectural history field surveys, archaeological testing of the site and completion of over 100 DPR forms for the evaluation of built environment resources. She also served as the on-site human osteologist. Client: Terry A. Hayes Associates, LLC. Agency: Caltrans.

**Azusa Intermodal Parking Facility Project, Azusa, Los Angeles County, California (2012).** Ms. Murray served as field director, assistant project manager, and primary report author for the intensive-level cultural resources survey and cultural resources technical report, which included evaluation of several built environment resources adjacent to an existing NRHP district. The City of Azusa proposed to construct an approximately 39-foot high, four-story parking structure, bus bays for passenger loading/unloading for layovers, and electric charging stations for patrons of the future Gold Line Foothill Extension Azusa Station. Client: Terry Hayes Associates.

**Terminal Island Historic Building Evaluations, Los Angeles County, California (2011).** Ms. Murray served as project manager, field director for the architectural history survey, and primary author of the technical report. She formally evaluated 16 Port of Los Angeles-owned properties on Terminal Island for NRHP and CRHR eligibility, as well as local level eligibility. Client: CDM; Port of Los Angeles.

**LOSSAN San Luis Rey River and Second Track Project, Oceanside, San Diego County, California (2011).** Ms. Murray served as primary author for the technical report and conducted the intensive-level cultural resources field survey. The project proposes to construct a new 0.6-mile section of double-track to connect two existing passing tracks, and replace the existing San Luis Rey River Bridge. She prepared the cultural resources technical report and evaluated the bridge for NRHP, CRHR, and local level criteria and integrity requirements. Client: HNTB Corporation.

**LADPW BOE San Pedro Plaza Park Project, Los Angeles County, California (2011).** Ms. Murray served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. She evaluated the entire park for local, CRHR, and NRHP eligibility and integrity requirements. The LADPW BOE proposed to conduct various outdoor improvements to the San Pedro Plaza Park. Client: LADPW BOE.

**Crenshaw /LAX Transit Corridor Project, Los Angeles County, California (2011).** Ms. Murray supervised architectural history survey and participated in the evaluation of over 100 built environment resources that may be affected by the Los Angeles County Metropolitan Transportation Authority's (Metro's) proposed Crenshaw/LAX Transit Corridor Project. The project is approximately 8.5 miles in length and is located within the cities of Los Angeles and Inglewood, Los Angeles County, California. The project was subsequently approved by SHPO with no comments. Client: Terry Hayes Associates, LLC; Agency: Metro.

**LOSSAN Control Point San Onofre to Control Point Pulgas Double Track Project, San Diego County, California (2011).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored the technical report. She conducted a survey and evaluation of cultural resources in support of the Los Angeles to San Diego, California (LOSSAN) Control Point (CP) San Onofre to CP Pulgas Double Track Upgrade Project. The project is located within the boundaries of the Marine Corps Base (MCB) Camp Pendleton in Northern San Diego County, on federal land that is part of a long-term lease to the rail operator. Client: HNTB Corporation.

**Half Moon Bay Airport Taxiway and Access Road Improvement Project, San Mateo County, California (2010).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored the technical report. She conducted a cultural resources survey of 21.65 acres situated on three areas within the 313-acre airport property, and evaluated airport properties for the CRHR and NRHP. Half Moon Bay Airport is located approximately 5 miles north of the City of Half Moon Bay in unincorporated San Mateo County, California. Client: Coffman Associates.

**Sunset Avenue Grade Separation Project, Riverside County, California (2010).** Ms. Murray served as field director for the archaeological and architectural history survey and co-authored

the ASR, HRER, and HPSR reports. The project involved a proposed grade separation of Sunset Avenue, which crosses the UPRR in the City of Banning, Riverside County. She conducted a 43.6-acre survey for cultural resources, and prepared environmental compliance documentation in accordance with Caltrans. Client: Kimley-Horn and Associates, Inc.; Agency: Caltrans District 8.

**Hollister Avenue Bridge Seismic Retrofit Project, Santa Barbara County, California (2010).**

Ms. Murray supervised the architectural history survey of surrounding properties. The project proposed the seismic retrofit of Union Pacific Railroad (UPRR) Bridge 51C-0018 on Hollister Avenue in an unincorporated area of Santa Barbara County, located between UPRR mile posts 362.08 and 362.41. Client: Santa Barbara County Public Works Department; Agency: Caltrans District 5.

**Nogales Grade Separation/Gale Avenue Widening/Evaluation of 938 Nogales Street; City of Industry, Los Angeles County, California (2009).**

Ms. Murray participated in the architectural history field survey of several properties and co-authored the report. The project consisted of conducting a cultural resources assessment for a proposed grade separation project that would lower Nogales Street beneath the Union Pacific Railroad tracks and widen a 0.83 mile section of Walnut Drive/Gale Avenue located in the City of Industry. Client: Terry A. Hayes Associates, LLC. Agency: Caltrans.

**Integrated Cultural Resources Management Plan Update for MCLB Barstow, San Bernardino County, California (2011-2014).**

Served as project manager for the 2014 ICRMP update of the 2011 ICRMP that she authored. The update includes survey and evaluation of two historic road segments, recordation and preparation of a conditions assessment of the Rattlesnake Rock Art site, and revision of the NRHP nomination for the site. Client: NAVFAC Southwest.

**Integrated Cultural Resources Management Plan, Naval Air Station, Lemoore, Kings County, California (2009-2012).**

Served as project manager and primary author of the Final ICRMP document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Station, Lemoore. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, Detachment Corona, Riverside County, California (2009-2011).**

Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach, Detachment Corona. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, Orange County, California (2009-2011).**

Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach. The management plan inventories known cultural resources, summarizes relevant laws

and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

**Integrated Cultural Resources Management Plan, Naval Air Weapons Station China Lake; Inyo, Kern, and San Bernardino Counties, California (2009-2011).** Served as co-author of the final document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Weapons Station China Lake. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation. Client: NAVFAC SW (U.S. Navy).

### Select Technical Reports (as lead author)

Murray, Samantha. 2015. *Historic Report for the property located at 3167 Senter Road, San Jose, California 95111, Assessor's Parcel Number (APN) 494-01-022.* Prepared for Launchpad Development and the City of San Jose.

Murray, Samantha and Salli Hosseini. 2015. *Cultural Resources Study for Tahoe Lake Elementary School Facilities Master Plan Project, Tahoe City, Placer County, California.* Prepared for the Tahoe Truckee Unified School District.

Murray, Samantha. 2015. *SDSU Open Air Theatre Renovation Historical Resources Technical Memorandum.* Prepared for SDSU.

Murray, Samantha. 2015. *Cultural Resources Study for the Mt. San Jacinto Community College District, San Jacinto Campus Master Plan Project, City of San Jacinto, Riverside County, California.* Prepared for the Mt. San Jacinto Community College District.

Murray, Samantha and Salli Hosseini. 2015. *Cultural Resources Study for the Jack in the Box Drive-Through Restaurant Project, City of Downey, Los Angeles County, California.* Prepared for the City of Downey.

Murray, Samantha. 2015. *Cultural Resources Study for the Hamilton Hospital Residential Care Facility Project City of Novato, Marin County, California.* Prepared for the City of Novato.

Murray, Samantha. 2015. *Historic Property Survey Report for the SR-86 Neckel Road Intersection Improvements and New Traffic Signal Light Project in the City and County of Imperial, California.* Prepared for the City of Imperial and Caltrans District 11.

Murray, Samantha. 2015. *Historical Resources Evaluation Report for the California Boulevard Roundabouts Project, City and County of Napa, California.* Prepared for the City of Napa and Caltrans District 4.

Murray, Samantha. 2015. *Historic Property Survey Report for the California Boulevard Roundabouts Project, City and County of Napa, California.* Prepared for the City of Napa and Caltrans District 4.

Samantha Murray, Salli Hosseini, Angela Pham, and Adam Giacinto. 2015. *Cultural/Historical Resource Technical Report: Morena Reservoir Outlet Tower Replacement Project Lake Morena Village, San Diego County, California, Services R-308078 Task Order No. 30*. Prepared for the City of San Diego.

Samantha Murray, Salli Hosseini, Adriane Dorrlor, and Brad Comeau. 2015. *Cultural/Historical Resource Technical Report: 69<sup>th</sup> and Mohawk Pump Station 5017 69<sup>th</sup> Street / 6910 Mohawk Street, San Diego, California 92115*. Prepared for the City of San Diego.

Murray, Samantha and Adam Giacinto. 2015. *Cultural Resources Technical Report for the SDSU Engineering and Interdisciplinary Sciences Building*. Prepared for SDSU.

Murray, Samantha. 2015. *Historical Resource Technical Report: San Carlos Library 7265 Jackson Drive, San Diego, California 92119*. Prepared for the City of San Diego.

Murray, Samantha. 2015. *Cultural Resources Study for the Robertson Lane Hotel and Commercial Redevelopment Project, City of West Hollywood, Los Angeles County, California*. Prepared for the City of West Hollywood.

Murray, Samantha. 2015. *Historic Resource Evaluation Report: 3877 El Camino Real Palo Alto, California 94306*. Prepared for the City of Palo Alto.

Murray, Samantha. 2015. *Addendum to Phase I Cultural Inventory for Pump Station No. 2 Power Reliability and Surge Protection Project, San Diego County, California (WBS# S-00312.02.02)*. Prepared for the City of San Diego.

Murray, Samantha. 2015. *Significance Evaluation of the Property at 8572 Cherokee Drive, City of Downey, Los Angeles County, California*. Prepared for the City of Downey.

Murray, Samantha. 2014. *Peer Review of Historic Resource Evaluations for 429-447 University Avenue and 425 University Avenue, Palo Alto, California*. Prepared for the City of Palo Alto.

Murray, Samantha. 2014. *Peer Review of the Draft Historic Resource Evaluation for 1050 Page Mill Road, Palo Alto, California*. Prepared for the City of Palo Alto.

Murray, Samantha. 2014. *Significance Evaluation of the Property at 3521 14 Mile House Road, Forest Ranch, Butte County, California*. Prepared for California State University, Chico.

Murray, Samantha, Adam Giacinto, and Justin Castells. 2014. *Cultural and Paleontological Resources Inventory for the Cove Development project, City of Chula Vista, California*. Prepared for E2 ManageTech Inc.

Murray, Samantha, Steven Treffers, and John Dietler. 2014. *Cultural Resources Survey Report for the Gaffey Pool and Bathhouse Project in San Pedro, City of Los Angeles, Los Angeles County, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.

Murray, Samantha. 2013. *Historic Property Survey Report for the Downtown Cesar Chavez Median Project, City and County of Los Angeles, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering and Caltrans District 7.

Murray, Samantha, Steven Treffers, and Shannon Carmack. 2013. *Historic Context Statement Report for Evaluation of Cold War-era Properties on Edwards Air Force Base, California*. Prepared for JT3, LLC.

Murray, Samantha, Steven Treffers, and Shannon Carmack. 2013. *Cultural Resources Survey Report for the Azusa Intermodal Parking Facility Project, City of Azusa, Los Angeles County, California*. Prepared for Terry A. Hayes Associates

Murray, Samantha, Steven Treffers, and John Dietler. 2012. *Final Cultural Resources Survey Report for the CP East Brook to CP Shell Double Track Project, San Diego County, California*. Prepared for HNTB Corporation.

Murray, Samantha and John Dietler. 2012. *Cultural Resources Survey Report for the Ford City Delivery Meter Station Project, Kern County, California*. Prepared for Mojave Pipeline Company.

Murray, Samantha, Steven Treffers, Mary Ringhoff, and Jan Ostashay. 2011. *Built Environment Evaluation Report for Properties on Terminal Island, Port of Los Angeles, City and County of Los Angeles, California*. Prepared for CDM and the Port of Los Angeles.

Murray, Samantha, Cheryle Hunt, and John Dietler. 2011. *Cultural Resources Survey Report for the South San Fernando Valley Park and Ride Project, City and County of Los Angeles, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.

Murray, Samantha, Brandi Shawn, and John Dietler. 2011. *Cultural Resources Survey Report for the San Pedro Plaza Park Project in San Pedro, City of Los Angeles, Los Angeles County, California*. Prepared for the City of Los Angeles Department of Public Works Bureau of Engineering.

Murray, Samantha and John Dietler. 2011. *Cultural Resources Survey Report for the WKN Wagner Wind Project, Palm Springs, Riverside County, California*. Prepared for the Altum Group.

Murray, Samantha, Laura Hoffman, and John Dietler. 2011. *Integrated Cultural Resources Management Plan for the Marine Corps Logistics Base, Barstow, California*. Prepared for the U.S. Department of the Navy NAVFAC SW and Marine Corps. Logistics Base Barstow.

Murray, Samantha, Robert Ramirez, and John Dietler. 2011. *Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Detachment Corona, Riverside County, California*. Prepared for the U.S. Department of the Navy NAVFAC SW.

Murray, Samantha and John Dietler. 2010. *Cultural Resources Overview and Survey Report for the Poso Creek Delivery Meter Station Project, Kern County, California*. Prepared for El Paso Corporation.



## Publications

Gross, C., Melmed, A., Murray, S., Dietler, S., and Gibson, H. 2012. *Osteological Analysis In Not Dead but Gone Before: The Archaeology of Los Angeles City Cemetery*, edited by H. Gibson and S. Dietler, AECOM Cultural Heritage Publication Number 4, San Diego.

Murray, S. 2013. *The People of Plaza Church Cemetery (1822-1844): An Osteological Analysis of Los Angeles' First Cemetery*. UMI Dissertation Publishing, ProQuest, LLC., Michigan.

## Presentations

***Historical Resources under CEQA. Prepared for the Orange County Historic Preservation Planner Working Group. Presented by Samantha Murray, Dudek. December 1, 2016.*** Ms. Murray delivered a one-hour PowerPoint presentation to the Orange County Historic Preservation Planner Working Group, which included planners from different municipalities in Orange County, regarding the treatment of historical resources under CEQA. Topics of discussion included identification of historical resources, assessing impacts, avoiding or mitigating impacts, overcoming the challenges associated with impacts to historical resources, and developing effective preservation alternatives.

***Knowing What You're Asking For: Evaluation of Historic Resources. Prepared for Lorman Education Services. Presented by Samantha Murray and Stephanie Standerfer, Dudek. September 19, 2014.*** Ms. Murray and Ms. Standerfer delivered a one-hour PowerPoint presentation to paying workshop attendees from various cities and counties in Southern California. The workshop focused on outlining the basics of historical resources under CEQA, and delved into issues/challenges frequently encountered on preservation projects.

## Relevant Training

- CEQA and Historic Preservation: A 360 Degree View, CPF, 2015
- Historic Designation and Documentation Workshop, CPF, 2012
- Historic Context Writing Workshop, CPF, 2011
- Section 106 Compliance Training, SWCA, 2010
- CEQA Basics Workshop, SWCA, 2009
- NEPA Basics Workshop, SWCA, 2008
- CEQA, NEPA, and Other Legislative Mandates Workshop, UCLA, 2008

# Kara R. Dotter, MSHP

## Senior Historic Preservation Specialist and Architectural Historian

Kara Dotter is a senior historic preservation specialist with more than 15 years experience in historic preservation and architectural conservation. Her historic preservation experience spans all elements of cultural resources management, including project management, intensive- and reconnaissance-level field investigations, architectural history studies, and historical significance evaluations in consideration of the National Register of Historic Places (NRHP), California Register of Historical Places (CRHR), and local-level designation criteria.

Ms. Dotter's background in geology informs many aspects of her architectural conservation work, including insight into the deterioration of building materials over time, which helps inform preservation strategies for various types of construction materials. She has experience with a variety of materials, in particular stone, brick, mortar, and concrete. Her materials analysis skills include petrographic analysis of stone, mortar, and concrete; paint analysis; wood species identification; and applicable American Society for Testing and Materials standards, as well as proficiency with Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDS), back-scattered electron imagery (BSE), atomic absorption spectrometry (AAS), differential thermal analysis (DTA), X-ray diffraction (XRD), and ion chromatography techniques.

Ms. Dotter exceeds the Secretary of the Interior's Professional Qualification Standards for Architectural History. She is experienced managing multidisciplinary projects in the lines of land development, state and local government, and the private sector. She has experience preparing environmental compliance documentation in support of projects that fall under the California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). She also prepared numerous Historic Architectural Survey Reports (HASRs) and Findings of Effect (FOE) reports for the California High-Speed Rail Authority.

## Project Experience

### Transportation

**Environmental Preconstruction Services for Construction Package 2 and 3, California High-Speed Rail Authority, Fresno to Bakersfield Section, California.** Served as project lead for the Built Environment component of the environmental preconstruction services. The work involved conducting cultural resources assessments for a proposed 65-mile-long segment of the Fresno to Bakersfield high-speed rail alignment as directed by the California High-Speed Rail Authority and Federal Transit Administration (FTA) in order to comply with NEPA and CEQA regulations. Ms. Dotter's contributions included architectural history field surveys; documenting and updating the CRHR-designated 7,040-acre Washington Irrigated Colony Rural Historic Landscape; completion of over 150 California Department of Parks and Recreation (DPR) forms for the evaluation of built environment resources; managing structural and vibration engineering consultants; conducting research for and producing HASRs and supplemental

### EDUCATION

Queen's University of Belfast

PhD Candidate (ABD)

University of Texas, Austin

MS, Geological Sciences, 2006

MS, Historic Preservation, 2004

University of Houston

BS, Geology, 1996

### CERTIFICATIONS

CEQA Practice Certificate (in progress)

### PROFESSIONAL AFFILIATIONS

Association for Preservation Technology

California Preservation Foundation

Construction History Society of America

Society of Architectural Historians



Findings of Effect (sFOEs); and development of Protection and Stabilization Plans and Response Plans for Unanticipated Effects and Unintended Damage.

**Environmental Compliance Services for the Caltrain Modernization (Calmod) Peninsula Corridor Electrification Project (PCEP).** Served as project lead for the Built Environment component of the environmental compliance services. The work involved cultural resources documentation in order to comply with NEPA and CEQA regulations relating to the electrification and increased capacity of the Caltrain Corridor from San Francisco's 4th and King Caltrain Station to approximately the Tamien Caltrain Station. Ms. Dotter's contributions include architectural history field surveys; managing subconsultants; conducting research for and producing documentation to HABS level III standards; and reviewing design plans and equipment placement for conformance with the Secretary of the Interior Standards for Rehabilitation.

**San Francisco International Airport (SFO) Residential Sound Insulation Program, Historic Architecture Services, As-Needed CEQA Planning Services for SFO.** Served as architectural historian and co-author of the Historical Resources Assessment Report. The work involved historical resources assessments and documentation of properties in the cities of San Bruno and Millbrae in order to comply with NEPA and CEQA regulations relating to SFO capital improvement projects. Ms. Dotter's contributions included architectural history field surveys; documenting 28 residential buildings; and completion of California Department of Parks and Recreation (DPR) forms for the evaluation of built environment resources.

## Municipal

**Santa Barbara Armory, California National Guard, Santa Barbara, Santa Barbara County, California.** Served as architectural historian and lead author of the update to state and local designations. The work involved historical resources documentation in order to comply with NEPA and CEQA regulations relating to the potential sale of the property. Ms. Dotter's contributions included updating documentation relating to the Santa Barbara Armory individual designation, as well as recording and evaluating the Santa Barbara Armory complex as a historic district for NRHP, CRHR, and local level criteria and integrity considerations; completion of DPR forms; and responding to SHPO comments.

**Normal Street DMV Facility Replacement, San Diego County, California.** Served as architectural historian and lead author of the Historical Resources Technical Report. The work involved cultural resources documentation in order to comply with NEPA and CEQA regulations relating to the proposed facilities replacement. Ms. Dotter's contributions included recording and evaluating the Normal Street DMV building for NRHP, CRHR, and local level criteria and integrity considerations, completion of DPR forms, and responding to SHPO comments.

## Development

**Village 3 HomeFed Otay Park Swap, Otay Ranch, Chula Vista, California.** Served as Cultural Resources project lead for the Constraints Analysis, as well as architectural historian and author of the Historical Resources Technical Report. The project proposed to develop approximately 100 acres of land south of the Otay River as an active recreation site. Ms. Dotter's contributions include architectural history field surveys; conducting archival research; recording and evaluating historical resources in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA.

**Santa Monica/Orange Grove Mixed-Use Development, 7811 Santa Monica Blvd., West Hollywood, California.** Served as architectural historian and co-author of the Historical Resources Technical Report, documenting existing conditions and conducting research into the history of the area and its relation to the three-parcel property in question.

**NEC Dinah Shore and Monterey Avenue Development, Palm Desert, California.** Served as architectural historian and co-author of the Cultural Resources Report, conducting research into the history of the area and its relation to the property in question.

**Montebello North and South, La Mesa, California.** Served as architectural historian and author of the Cultural Resources Technical Report, conducted research into the history of the area and its relation to the 4.16 acre subject property, documented existing conditions, and liaised with the City of La Mesa Planning Department to bring about a successful result for the client.

## Education

**Fullerton College Facilities Master Plan Program EIR, North Orange County Community College District, City of Fullerton, Orange County, California. 2017.** The North Orange County Community College District (NOCCCD) is undertaking a comprehensive improvement and building program to make upgrades and repairs to existing buildings, as well as to construct new facilities to improve the safety and education experience of those attending Fullerton College. The College proposed to implement the Facilities Master Plan to more effectively meet the space needs of the projected on-campus enrollment through the next decade and beyond, while constructing and renovating facilities to meet the District's instructional needs. Ms. Murray co-authored and oversaw the cultural resources study. All buildings and structures on campus over 45 years old and/or proposed for demolition/substantial alteration as part of the proposed project were photographed, researched, and evaluated in consideration of NRHP, CRHR, and local designation criteria and integrity requirements, and in consideration of potential impacts to historical resources under CEQA. As a result of the significance evaluation, three historic districts and one individually eligible building were identified within the project area. The study also entailed conducting extensive archival and building development research, a records search, Native American coordination, detailed impacts assessment, and development of mitigation measures for project conformance with the Secretary of the Interior's Standards for Rehabilitation.

**Kings Beach Elementary School Facilities Master Plan Project, Tahoe Truckee Unified School District (TTUSD), Kings Beach, California.** Served as architectural historian and lead author of the cultural resources study. Recorded and evaluated the Kings Beach Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

**Donner Trail Elementary School Modernization Project, Tahoe Truckee Unified School District (TTUSD), Kingvale, California.** Served as architectural historian and lead author of the cultural resources study. Recorded and evaluated the Kings Beach Elementary School Building for NRHP, CRHR, and local level criteria and integrity considerations. The study also entailed conducting archival and building development research, a records search, and Native American coordination.

## Water/Wastewater

**North County Pure Water Project, City of San Diego, California.** Ms. Dotter served as architectural historian and lead author of the Historical Resource Technical Report for the proposed pipeline route as

part of the EIR/EIS. Preparation of the report involved conducting extensive building development and archival research on historic-era structures along the proposed 56-mile-long route, development of related historic contexts, historical significance evaluations for each historic-era structure in consideration of local, state, and national designation criteria and integrity requirements, and determining appropriate mitigation measures.

**Historical Resource Evaluation Report for the San Dieguito Dam, Santa Fe irrigation District, Rancho Santa Fe, California.** Served as architectural historian and lead author of the Historical Resource Evaluation Report for the proposed handrail replacement project. Preparation of the report involved conducting extensive engineering development and archival research on dams, development of an historic context, and historical significance evaluation for the historic-era structure in consideration of local, state, and national designation criteria and integrity requirements.

## Relevant Previous Experience

### Development

**Historic Resource Nomination Report for 1445 Granada Avenue, San Diego, California.** Conducted archival research, interviews, extensive photo documentation, and forensic analysis of a 1912 Craftsman-style home in support of designation as an historic resource. Ms. Dotter also compiled supporting evidence for proposing a new San Diego Master Architect/Builder. The building was successfully nominated in May 2017.

**Historic Resource Technical Report for 1644 University Avenue, San Diego, California.** Served as architectural historian and author of the Historical Resource Technical Report. Preparation of the report involved conducting extensive building development and archival research on the commercial building, development of an historic context, and an historical significance evaluation in consideration of local, state, and national designation criteria and integrity requirements. The project proposed to build a new multi-use development with retail space, parking, and luxury condominiums. (2015)

### Education

**Rehabilitation of Lincoln Hall, University of Nevada, Reno.** Provided peer review of mortar repair specifications and fire code upgrades for the historic two-and-a-half story Lincoln Hall, constructed of brick in 1895 as a men's residence hall. Recommendations included changing the specified mortar mix to an historically appropriate mix design similar to that used originally and more compatible with existing materials. The suggested fire code upgrades originally called for infilling the intentionally designed wall ventilation space between interior and exterior wythes of brick with Portland cement-based grout, altering the breathability and functioning of the building envelop. Ms. Dotter instead recommended discreet insertion of fire blocks between the wythes at each floor level. (2015)

**Queen's University Belfast Main Building Materials Analysis, Belfast, Northern Ireland.** Collected mortar samples and conducted materials analysis to identify components and develop recommendations for repair mortars. The project also entailed mapping exterior walls for areas of deterioration affecting mortar and brick. (2010)

### Municipal

**Paint Analysis for Mohnike Adobe, San Diego County, California.** Analyzed selected paint chip samples to develop a stratigraphy of paint layers useful in identifying replacement materials and creating

an historically appropriate paint scheme for ongoing renovations to this San Diego County-owned property. (2016)

**Materials Conservation Assessment and Recommendations for Stone Quoins, Old Antrim Courthouse, Antrim, Northern Ireland.** Investigated the existing condition of heavily-painted stone quoins on the Grade A listed 1726 Italianate-style Old Antrim Courthouse, the oldest courthouse in Northern Ireland, during extensive rehabilitation of the structure into a cultural events center. The surface of the original sandstone ashlar blocks was friable due to impermeable paint layers retaining moisture within the stone. Recommendations included gentle removal by hand of existing paint layers, misting of more recalcitrant paint layers, and consolidation or replacement-in-kind of more damaged stone. (2011)

## Specialized Training

- Tips and Tools for Environmental Review: Mastering the CEQA Process for Historic Properties in the Bay Area, 2016. California Preservation Foundation (CPF).
- Section 106: An Introduction, 2015. National Preservation Institute (NPI).
- Wood Identification Workshop, 2010. Institute of Conservator-Restorers in Ireland (IPCRA).
- Crafts and Trades, 2008. APT.
- Salts in Traditional Masonry Buildings, 2008. Scottish Lime Centre, Scotland.
- Introduction to Lime, 2007. Calch Ty-Mawr, Wales.
- Introduction to Microscopical Identification of Conservation Materials, 2006. McCrone Group.

## Publications

### Selected Technical Reports

Dotter, Kara R., Samantha Murray, and Matthew DeCarlo. 2017. *Historical Resources Technical Report for the North City Project, San Diego County, California*. Prepared for the City of San Diego Public Utilities Department.

Dotter, Kara R., Sarah Corder, and Samantha Murray. 2017. *Historic Resources Evaluation for the Normal Street Department of Motor Vehicles Site, 3960 Normal Street, San Diego, California*. Prepared for the State of California Department of General Services.

Dotter, Kara R., Sarah Corder, William Burns, and Adam Giacinto. 2017. *Historical Resources Technical Report for Siskiyou Hall, Chico, California*. Prepared for California State University, Chico Campus.

Dotter, Kara R. and Adriane Dorrlor. 2017. *Historical Resources Technical Report for 1430 National Avenue*. Prepared for LLJ Ventures, LLC.

Dotter, Kara R. and Samantha Murray. 2017. *Cultural Resources Technical Report for Santa Monica/Orange Grove Mixed-Use Development, 7811 Santa Monica Boulevard*. Prepared for the City of West Hollywood.

Dotter, Kara R. 2016. *Historical Resources Evaluation Report for 7664 El Cajon Blvd., La Mesa, California*. Prepared for A.P.T.S., Inc.

Dotter, Kara R. and Samantha Murray. 2016. *Cultural Resources Study for Kings Beach Elementary School Facilities Master Plan Project, Kings Beach, Placer County, California*. Prepared for the TTUSD.

- Dotter, Kara R., Ione Stiegler, Vonn Marie May, Katie Debiase. 2016. *District Update for the Washington Irrigated Colony Rural Historic Landscape, Fresno County, California*. Prepared for the California High-Speed Rail Authority and California State Historic Preservation Officer.
- Dotter, Kara R., Ione Stiegler, Rick Tavares, and Mel Green. 2016. *Plan for Protection and Stabilization and Response Plan for Unanticipated Effects and Inadvertent Damage: Lakeside Cemetery, Hanford, California*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R., Ione Stiegler, Rick Tavares, and Mel Green. 2016. *Findings of Effect for the Fresno to Bakersfield Project Section Primary Re-examination Area for Construction Package 2-3: Addendum to the Findings of Effect*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R. and Ione Stiegler. 2016. *Historic Architectural Survey Report Addendum No. 5 (Primary Re-examination Area), Fresno to Bakersfield Project Section*. Prepared for the California High-Speed Rail Authority.
- Dotter, Kara R. and Ione Stiegler. 2015. *Historic Resource Nomination Report for 1445 Granada Ave., San Diego, California*. Prepared for private client.
- Dotter, Kara R. and Ione Stiegler. 2015. *Historic Resource Technical Report for 1644 University Ave., San Diego, California*. Prepared for private client.

## Other Publications

- Dotter, K. R. 2010. "Historic Lime Mortars: Potential Effects of Local Climate on the Evolution of Binder Morphology and Composition." *Limestone in the Built Environment: Present Day Challenge for Preservation of the Past*. Geological Society of London. Special Publication 331.
- Dotter, K. R., Smith, B. J., McAlister, J., and Curran, J. 2009. "Sacrifice and Rebirth: The History of Lime Mortar in the North of Ireland." *Proceedings of the 3rd International Congress on Construction History*. Brandenburg University of Technology. May 2009.
- Dotter, K. R., Smith, B. J., McAlister, J., and Curran, J. 2008. "Effects of Weathering Processes on Conservation Mortars and the Surrounding Stone Substrate." *Proceedings of the 11<sup>th</sup> International Congress on Deterioration and Conservation of Stone*. Nicolaus Copernicus University Press. September 2008.
- Dotter, K. R. 2007. "Symbolism of Stone Use in Traditional Chinese Gardens." *STONE: Newsletter on Stone Decay*. No. 3.

## Conference Presentations

- "The Weathering of Conservation Mortars, and Implications for Historic Preservation." 2011. Presented at the Association for Preservation Technology (APT) Annual Conference. Victoria, British Columbia, Canada.
- "40 Years of Conservation Mortars: Evolution and Effects." 2008. Presented at the APT Annual Conference. Montréal, Québec, Canada.
- "Historical and Current Analysis Methodologies for the Characterization of Historic Lime Mortars." 2006. Presented at the American Institute for Conservation of Historic and Artistic Works (AIC) Annual Conference. Providence, Rhode Island.

"Characterization and Comparison of Modern and Historic Lime Mortars." 2005. Presented at the APT Annual Conference, 21–26 September 2005, Halifax, Nova Scotia, Canada.

"Air Pollution Interaction with Consolidated Stone." 2005. Joint project presented by Tye Botting at the AIC Annual Conference. Minneapolis, Minnesota.

"Early 20th Century Prison Technology." 2004. Presented at the APT Annual Conference. Galveston, Texas.

# Sarah Corder

## Architectural Historian

Sarah Corder is an architectural historian with more than 10 years' professional experience throughout the United States in the fields of architectural history and historic preservation. Prior to coming to Dudek, she owned and operated a historic preservation consulting business in Virginia. Throughout her career, Ms. Corder managed and worked on a variety of projects including National Register of Historic Places (NRHP) nominations, tax credit rehabilitation projects, Save America's Treasures projects, and numerous transportation projects. She served as a historic preservation project manager or architectural historian on all projects.

## Relevant Project Experience

### EDUCATION

Savannah College of Art and Design

MFA, Historic Preservation, 2004

Bridgewater College

BA, History, 2002

### CERTIFICATIONS

Certified Historic Preservation Consultant,  
Commonwealth of Virginia

Secretary of the Interior's Standards in  
Architectural History and History, exceeds  
requirements

### PROFESSIONAL AFFILIATIONS

National Trust for Historic Preservation

Los Angeles Conservancy

Society for Architectural Historians

**As-needed CEQA Planning Services, SFO, San Francisco, California.** Ms. Corder prepared a historical resources assessment report that included 28 properties in consideration of national, state and local criteria and integrity requirements. The project also included a survey, archival research, records search and preparation of DPR forms for each property.

**Castellija School Project Focused Environmental Impact Report (EIR), Palo Alto, California.** Ms. Corder prepared a cultural resource study that included 11 historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.

**CSU, Chico, Siskiyou Hall, Chico, California.** Ms. Corder prepared a historical resources technical report for Siskiyou Hall located on the CSU, Chico campus. The project also included a survey, archival research, and a records search.

**Environmental Services Retainer, Southern California.** Ms. Corder assisted with the preparation of a historical resources technical report for a DMV building in San Diego, California. Her contributions included archival research and preparation of historic context sections.

**Fullerton College Master Plan Program Environmental Impact Report (EIR), Fullerton, California.** Ms. Corder prepared a cultural resource study that included 25 historic resources in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.

**Olivewood Village Historic Resources Assessment, Pasadena, California.** Ms. Corder prepared a historical resources technical report for an institutional building in consideration of national, state, and local criteria and integrity requirements. The study also included a survey, archival research, and a records search.



**Owlwood, Los Angeles, California.** Ms. Corder prepared a cultural resources study for a residential building in consideration of national, state, and local criteria and integrity requirements. The study also included archival research, and a records search.

**Pacific Freeway Center, Fontana, California.** Ms. Corder prepared a cultural resources survey report for a large industrial complex in consideration of national, state, and local criteria and integrity requirements. The study also included preparation of DPR form, archival research, survey, and a records search.

**University Villages, Merced Student Housing Project, Merced, California.** Ms. Corder prepared a cultural resources letter report for a residential agricultural complex in consideration of national, state, and local criteria and integrity requirements. The study also included preparation of a DPR form, archival research, survey, and a records search.

#### Relevant Previous Experience

#### Development

**East Los Angeles College Environmental Impact Report (EIR), South Gate, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings, and developed mitigation measures.

**Wetlands Pocket Park, Los Angeles, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

#### Transportation

**Crenshaw/Los Angeles International Airport (LAX) Transit Corridor, Cities of Los Angeles and Inglewood, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

**Alameda Corridor–East Construction Authority (ACE) San Gabriel Trench Grade Separation, Los Angeles County, California.** Served as architectural historian for the project. Evaluated and recorded historic period buildings.

#### NRHP Evaluations and Nominations

**Old Town Historic District, Harrisonburg, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 450 historic buildings and structures, prepared presentations for public meetings, performed extensive primary and secondary source research, and managed survey teams.

**Whitesel Brothers, Harrisonburg, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded historic building and prepared an NRHP nomination.

**Ramsay, Greenwood, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 17 historic buildings and structures and prepared an NRHP nomination.

**George Chrisman House, Linville, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded historic buildings and structures and prepared an NRHP nomination.



**David and Catherine Driver Farm, Timberville, Virginia.** Served as project manager and architectural historian for the project. Evaluated and recorded 823 acres of farming complex including seven historic buildings and five structures and prepared an NRHP nomination.

## Professional Experience

**SWCA Environmental Consultants, Pasadena, California.** Served as an architectural historian and a project coordinator for multiple programs. Responsibilities included historic resource surveys, primary and secondary research, and quality assurance (QA)/quality control (QC) and senior level oversight for hundreds of California Department of Parks and Recreation forms. (2009–2014)

**Sabe Preservation Consulting, Harrisonburg, Virginia.** Owned a historic preservation consulting services firm. Responsibilities included NRHP nomination preparation and inventory; rehabilitation project management; Section 106 review; Main Street planning and development; building condition assessment and Historic American Buildings Survey (HABS) documentation; management of all financial documents; client interaction; leading public meetings and workshops; and management of employees, interns and subcontractors. (2004–2009)

**Owens-Thomas House Museum, Savannah, Georgia.** Served as preservation project manager for a nineteenth century plaster conservation project. Responsibilities included plaster conservation, management and training of staff and student interns, photographic documentation, presentation of project information to the public and museum staff, preparation of weekly reports, and safety compliance. (2005–2006)

# **APPENDIX H**

## ***Preliminary Drainage Plan***



January 7, 2019

DLR Group  
1650 Spruce Street, Suite 300  
Riverside, CA 92507

Subject: Fullerton College – Sherbeck Field  
321 E. Chapman Avenue, Fullerton CA  
Preliminary Drainage Analysis

To Whom It May Concern,

## Existing Conditions

The proposed project is located at Sherbeck Field on the Fullerton College campus located at 321 E. Chapman Avenue in Fullerton, California. The site currently consists of an artificial turf field surrounded by a synthetic running track. The site is surrounded by drive aisles and parking to the north, south, and east as well as a field house located to the west of the site. In the current conditions, water drains from north to south into existing catch basins along the perimeter of the site. From there, it is collected into an existing storm drain system that captures flow from the surrounding areas.

## Proposed Conditions

Proposed work for this project includes the construction of bleachers as well as the adjacent ramps and sidewalks required for access. In the proposed condition, it is anticipated that approximately 90% of both drainage areas will be impervious while 10% will remain pervious. However, due to the project's nature of work, it is not anticipated that any major drainage patterns will need to be altered to effectively treat stormwater on site. The locations for water quality treatment infrastructure as shown on the attached exhibit in Appendix D is approximate.

## Technical Requirements

Preliminary stormwater design and analysis was conducted for the site per the Orange County Technical Guidance Document (TGD). In accordance with the TGD, runoff from the areas of proposed work must be treated through BMPs or captured and reused. To treat this area most efficiently, the overall site area was divided into two separate drainage areas with their own BMP systems. In addition to the technical requirements, the limited area on site was taken into consideration for BMP design.

## Conclusion and Recommendations

Based on the requirements outlined in Orange County Technical Guidance Document and site characteristics, it is our recommendation to have the site runoff either surface flow or be captured and directed into Bioswales on the northern and southern sides of the site. The swales shall be designed with a trapezoidal with side slopes of no more than 2:1 (H:V), with a 3 foot base width as shown on the provided cross sections in Appendix D. All overflow drainage will be directed into the existing curb and gutter system around the site. The swale lengths as shown on the exhibit provided in Appendix D were calculated per the Orange County Technical Guidance Document which can be found in Appendix C. Rather than proposing one 121-foot swale for the southern drainage area, two shorter swales are provided to allow for surface flow while minimizing earthwork costs.

## Appendix A – Site Photos



Drainage Area 1  
(North of Sherbeck Field)



Drainage Area 2  
(South of Sherbeck Field)



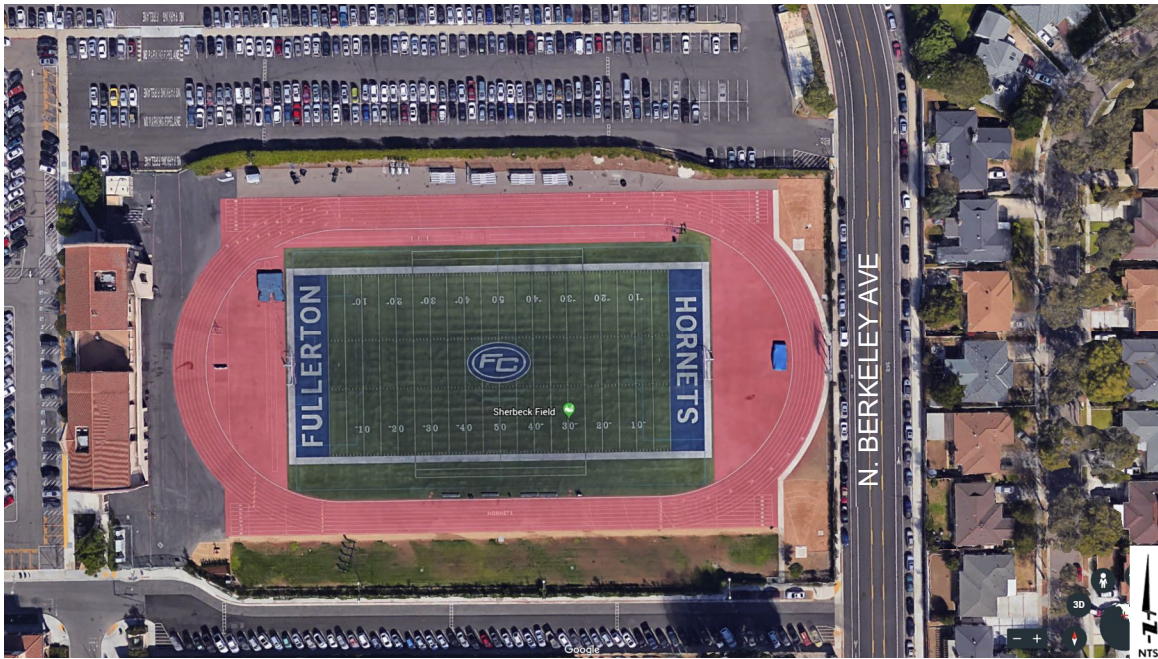
Catch Basin South of the site to be used for  
overflow conditions



Drainage Area 2 with existing catch basin  
used for drainage

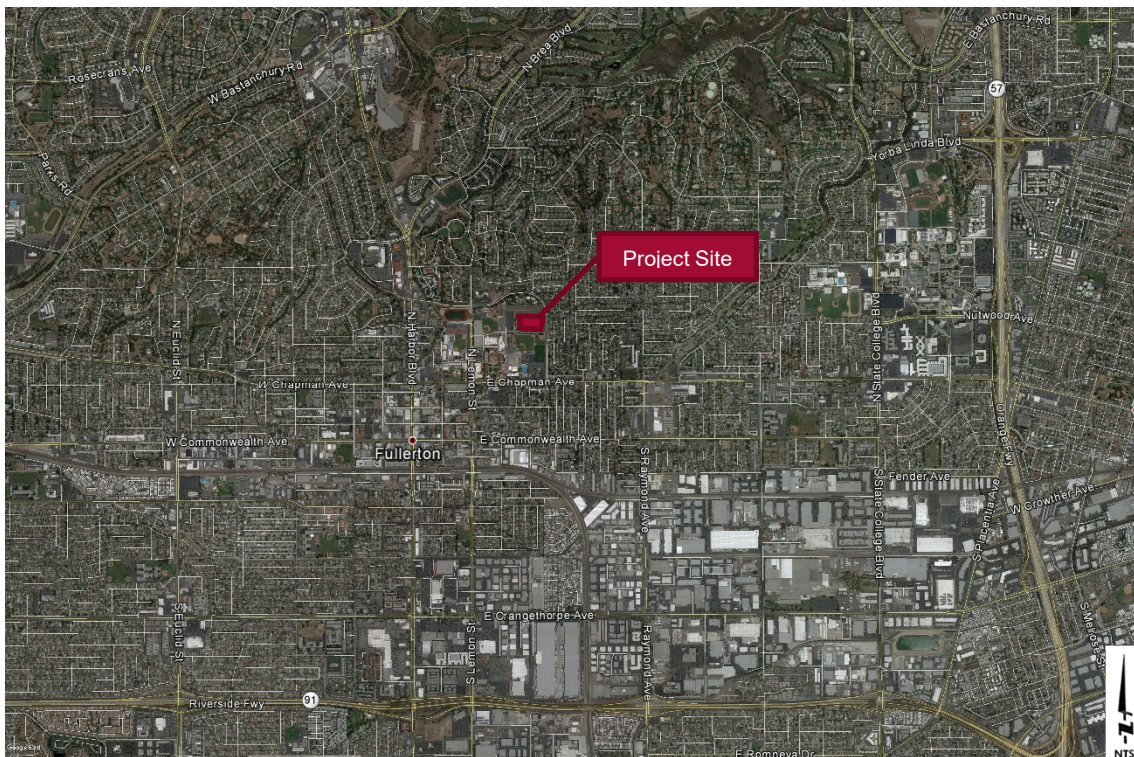


## Appendix B – Vicinity Map and Aerial



**Aerial (Not to Scale)**

Source: Google Maps



**Vicinity Map (Not to Scale)**

Source: Google Earth

## Appendix C – Detailed BMP Sizing Calculations

### Site Information

DMA 1	0.50	ac	
DMA 2	0.59	ac	
Impervious Area:	90%		
Pervious Area:	10%		
Design Storm Depth (85th)	0.85	in	From Orange County Technical Guidance Document (TGD)

### DMA 1

**Bioswale** Designed per Orange County TGD

C	0.825		$C = (0.75 * \text{Impv. Area}) + 0.15$
A	0.50	ac	
T <sub>c</sub>	12.5	min	Per Orange County Hyrdology Manual
I	0.22	in/hr	Per Orange County Hyrdology Manual
Q	0.091	cfs	$Q = C \times I \times A$
<b>Swale Width</b>	<b>2.42</b>	<b>ft</b>	Assumes flow depth of 2" and Slope in direction of flow of 1%
	0.46	sf	Assumes 2:1 Slope
CS Area at Flow Depth			
Flow Velocity	0.20	fps	
<b>Required Swale Length</b>	<b>119</b>	<b>lf</b>	$L = 60 \times 10 \times \text{Flow Velocity}$

### DMA 2

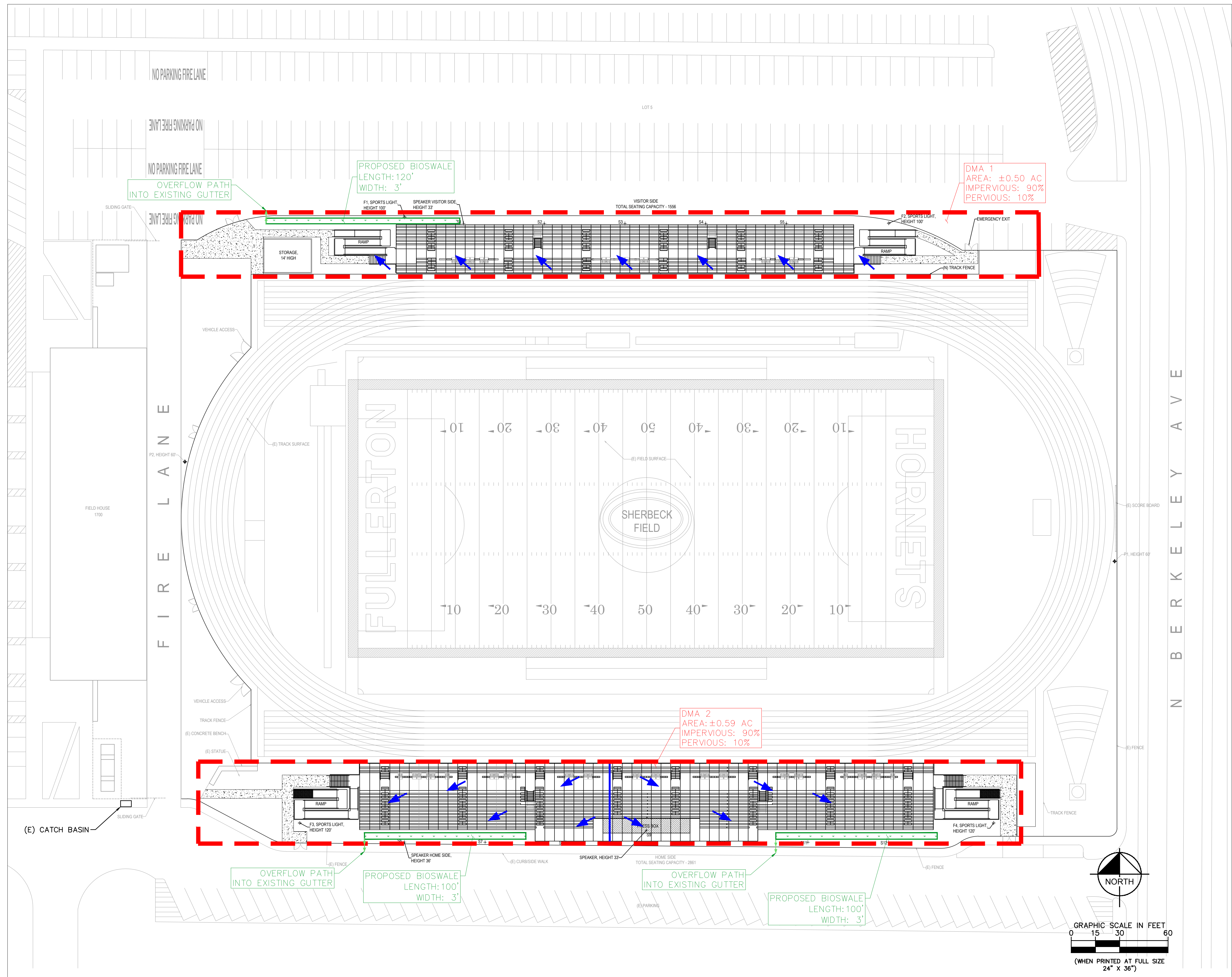
**Bioswale** Designed per Orange County TGD

C	0.825		$C = (0.75 * \text{Impv. Area}) + 0.15$
A	0.59	ac	
T <sub>c</sub>	12.5	min	Per Orange County Hyrdology Manual
I	0.22	in/hr	Per Orange County Hyrdology Manual
Q	0.107	cfs	$Q = C \times I \times A$
<b>Swale Width</b>	<b>2.86</b>	<b>ft</b>	Assumes flow depth of 2" and Slope in direction of flow of 1%
	0.53	sf	Assumes 2:1 Slope
CS Area at Flow Depth			
Flow Velocity	0.20	fps	
<b>Required Swale Length</b>	<b>121</b>	<b>lf</b>	$L = 60 \times 10 \times \text{Flow Velocity}$

**Appendix D – Preliminary Drainage Analysis Exhibit**



PRELIMINARY DRAINAGE ANALYSIS



Site Information

DMA 1	0.50	ac
DMA 2	0.59	ac

Impervious Area:	90%
Pervious Area:	10%
Design Storm Depth (85th)	0.85 in
From Orange County Technical Guidance Document (TGD)	

DMA 1

Bioswale

Designed per Orange County TGD

C	0.825	C = (0.75 * Impv. Area) + 0.15
A	0.50	ac
Tc	12.5	min Per Orange County Hyrdology Manual
I	0.22	in/hr Per Orange County Hyrdology Manual
Q	0.091	cfs Q = C x I x A

Swale Width	2.42	ft	Assumes flow depth of 2" and Slope in direction of flow
CS Area at Flow Depth	0.46	sf	Assumes 2:1 Slope
Flow Velocity	0.20	fps	
Required Swale Length	119	lf	L = 60 x 10 x Flow Velocity

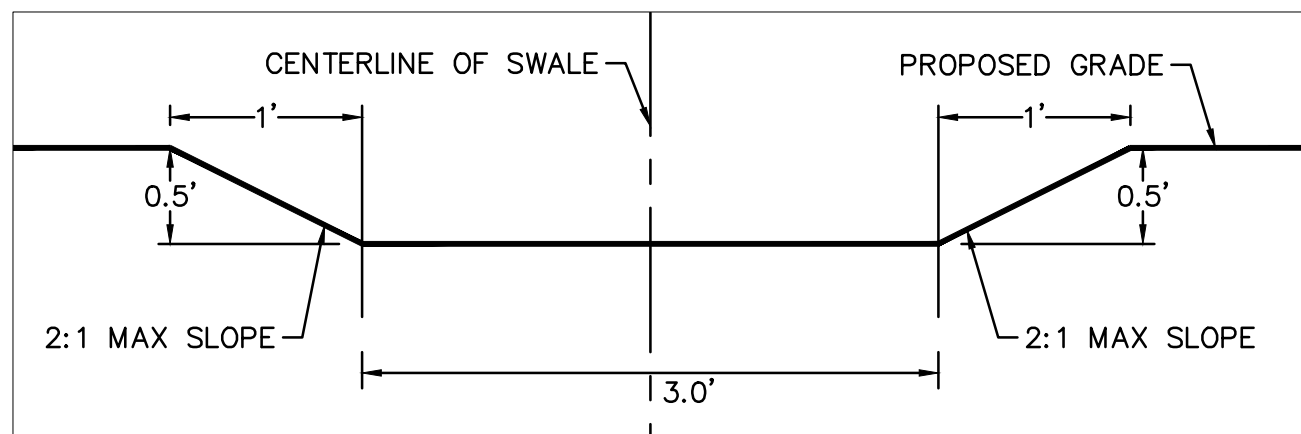
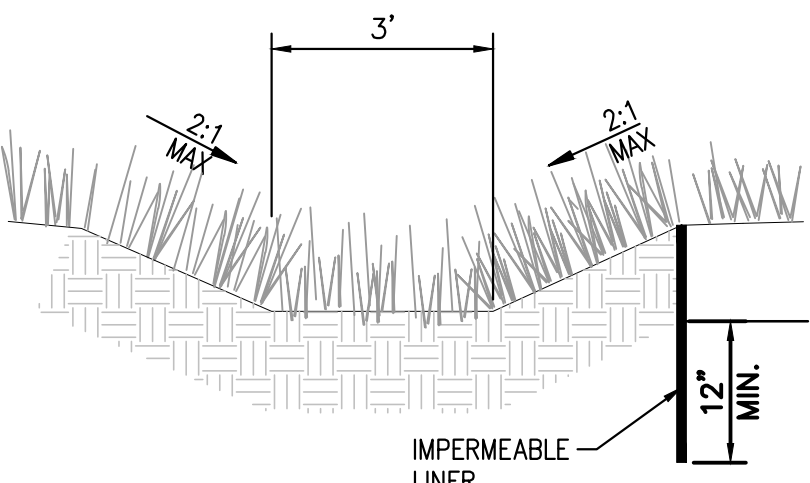
DMA 2

Bioswale

Designed per Orange County TGD

C	0.825	C = (0.75 * Impv. Area) + 0.15
A	0.59	ac
Tc	12.5	min Per Orange County Hyrdology Manual
I	0.22	in/hr Per Orange County Hyrdology Manual
Q	0.107	cfs Q = C x I x A

Swale Width	2.86	ft	Assumes flow depth of 2" and Slope in direction of flow
CS Area at Flow Depth	0.53	sf	Assumes 2:1 Slope
Flow Velocity	0.20	fps	
Required Swale Length	121	lf	L = 60 x 10 x Flow Velocity



BIOSWALE CROSS SECTION

LEGEND

DMA BOUNDARY	---
FLOW ARROW	→
LANDSCAPED BIOSWALE (MIN 100 LF LENGTH REQUIREMENT)	---