LINSCOTT LAW & GREENSPAN engineers

LOCAL MOBILITY ANALYSIS

11011 TORREYANA PROJECT

PRJ 1058759

City of San Diego, California
April 2024

LLG Ref. 3-22-3527

Prepared by:
Amelia Giacalone
Senior Transportation Planner

Under the Supervision of:
John Boarman, RTE
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

LINSCOTT LAW & GREENSPAN engineers

LOCAL MOBILITY ANALYSIS

11011 TORREYANA PROJECT

PRJ 1058759

City of San Diego, California
April 2024

LLG Ref. 3-22-3527

Prepared by:
Amelia Giacalone
Senior Transportation Planner

Under the Supervision of:
John Boarman, RTE
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

EXECUTIVE SUMMARY

Linscott, Law & Greenspan, Engineers (LLG) has prepared this Local Mobility Analysis (LMA) for the 11011 Torreyana Road Project (hereby referred to as the "Project"). The Project site is located at the terminus of Torreyana Road, north of Callan Road within the University Community Plan area in the City of San Diego.

Project Description

The Project proposes to demolish 76,694 SF of Research and Development space and build 152,080 SF of Research and Development space. The site's existing use is currently occupied and operational. Redevelopment of the Project will require Coastal and Site Development permits. The anticipated opening year is 2026.

Access to the site is proposed via two driveways off Torreyana Road. The southern driveway is proposed opposite Callan Road, forming the fourth leg of the Torreyana Road / Callan Road intersection, and will be used solely for deliveries and fire access. The northern driveway, which currently serves the site, will remain and serve as the primary day-to-day access point.

In conformance with Senate Bill 743 (SB 743), under a separate cover, a Transportation Impact Analysis was prepared that evaluates the Project's transportation impacts using a Vehicle Miles Traveled (VMT) metric under CEQA, per the City of San Diego's Transportation Study Manual (September 2022), pursuant to guidance from the Governor's Office of Planning and Research (OPR) in December 2018. Consistent with SB 743 and CEQA Guidelines 15064.3, the CEQA significance determination for the Project will be based only on VMT and not on LOS. This report is a Local Mobility Analysis (LMA) that focuses on automobile delay and LOS within the project's study area within the University Community Plan and evaluates the effects of the Project on the local transportation system to determine if the Project triggers the need for improvements.

Trip Generation

It should be noted that the Project's trip generation and subsequent analysis contained in this LMA are based on the Project's *total building area* of 203,096 SF. Since the time in which the Project's trip generation and analysis were conducted, the Project's gross floor area was refined to 152,080 SF based on coordination with City staff and using the City of San Diego Municipal Code as a guide to exclude non-occupiable areas. This includes space dedicated to support-type uses (including the cooling tower, refuse/recycling areas, emergency electrical areas, emergency generator/gas storage, SDGE, and others that are typically not located within the building itself), the basement area, and overhang areas, among others, as detailed in *Appendix L*.

Assuming the Project's total building area of 203,096 in the Project's trip generation calculations and subsequent analysis is a conservative approach as it assumes more occupiable area as compared to the proposed 152,080 SF.

Assuming the total building area of 203,096 SF, the Project is estimated to generate approximately 1,011 net new ADT with 162 net new AM peak hour trips (146 inbound / 16 outbound) and 142 net new PM peak hour trips (14 inbound / 128 outbound).

To determine the potential Opening Year 2026 traffic effects from the Project, traffic volumes for the Opening Year 2026 without Project and Opening Year 2026 with Project scenarios were developed and traffic operations were evaluated.

Parking

The number of parking spaces for automobile, bicycle, and motorcycle parking shall comply with the Land Development Code (LDC) regulations. Based on the City of San Diego's minimum parking rates, the Project is required to provide a minimum of 426 vehicular parking spaces. The project proposes to provide 484 parking spaces, exceeding the City of San Diego's minimum parking requirement.

The Project is required to provide the following:

- 426 total parking spaces
- 13 accessible parking spaces
- 44 clean air/low emitting parking spaces
- 98 EV charging parking spaces
- 9 motorcycle parking spaces
- 0 short-term bicycle parking spaces
- 21 long-term bicycle parking spaces

The Project proposes to provide the following:

- 484 total parking spaces
- 16 accessible parking spaces
- 44 clean air/low emitting parking spaces
- 98 EV charging parking spaces, 50 of which will be supplied with charging equipment
- 9 motorcycle parking spaces
- 3 short-term bicycle parking spaces
- 24 long-term bicycle parking spaces

Project Effects and Recommendations

Intersection Operations Analysis and Findings

The intersections of Genesee Avenue and the I-5 northbound and southbound ramps are forecast to operate at LOS E or F under Opening Year (2026) conditions, both without and with Project traffic. Based on a review of the *One Alexandria Square Local Mobility Analysis*, January 7, 2022, which was prepared for a project (PTS #660043) in the immediate vicinity of the proposed Project site, the existing signal timing and cycle length at these two intersections is not long enough to adequately

serve all movements during the peak hours. Based on coordination with City staff and Caltrans for the *One Alexandria Square* project, it was determined that an increase in cycle length may reduce delays but would increase queue lengths at the southbound and northbound I-5 off-ramp movements. Therefore, improvements are not proposed at the two ramp intersections for the Genesee Avenue / I-5 interchange.

The remaining analysis intersections were calculated to operate acceptably at LOS D or better with the addition of Project trips, and therefore no off-site improvements are proposed.

Turn Lane Evaluation Findings

The need for left-turn or right-turn lanes at the signalized study intersections was evaluated per the criteria identified in the City of San Diego's Transportation Study Manual (September 2022). The results of the turn lane evaluation showed that the addition of project traffic would not result in the need for a dedicated or second left-turn lane or a dedicated or second right-turn lane on the approaches of the signalized study intersections where these lanes are currently not provided.

Queuing Analysis Findings

The queuing analysis results showed that the 95th percentile queue length is expected to exceed the storage length at the following locations for both the Opening Year 2026 and Opening Year 2026 + Project scenarios.

- #4 Torrey Pines Road / Science Park Road – Westbound Left (PM Peak Hour) and Northbound Right (AM Peak Hour). The PM peak hour westbound left-turn queue is calculated to increase from 309' under without Project conditions to 328' under with Project conditions. The increase of 19' will not alter traffic operations in a meaningful way. The AM peak hour northbound right-turn queue is calculated to increase from 261' under without Project conditions to 286' under with Project conditions. The increase of 25' will not alter traffic operations in a meaningful way. As shown in *Table 8-1*, the intersection is calculated to operate acceptably at LOS C/C during the AM/PM peak hours under the Opening Year 2026 scenario and at LOS C/D during the AM/PM peak hours under the Opening Year 2026 + Project scenario. Therefore, improvements are not proposed.
- #5 Genesee Avenue / I-5 SB Ramps – Southbound Right (AM Peak Hour). The AM peak hour southbound right-turn queue is calculated to remain at 1,184' under both the without Project and with Project scenarios. Therefore, improvements are not proposed.
- #6 Genesee Avenue / I-5 NB Ramps – Northbound Left (AM & PM Peak Hours). The northbound left-turn queue is calculated to increase from 1,101' under without Project conditions to 1,109' under with Project conditions during the AM peak hour, and from 1,002' under without Project conditions to 1,107' under with Project conditions during the PM peak hour. The increase of 5' during the AM peak hour and the increase of 105' during the PM peak hour will not alter traffic operations in a meaningful way. Additionally, as shown in *Table 8-1*, the intersection is calculated to continue to operate at LOS D during the AM peak hour and LOS F during the PM peak hour under the

Opening Year 2026 and the Opening Year 2026 + Project scenarios. Therefore, improvements are not proposed.

Systemic Safety Review Findings

Based on an evaluation of the intersection footprints found in *Appendix C* of the *City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report (April 2019)*, the following study area intersection is identified as a "hot spot" and meets Bicycle Footprint #2, necessitating further evaluation:

- #3: N. Torrey Pines Place / Callan Road

For intersections that meet the Bicycle Footprint #2 criteria, the City of San Diego's *Systemic Safety, The Data-Driven Path to Vision Zero* Report (April 2019), recommends non-engineering countermeasures that include educational countermeasures such as a public safety messaging campaign, and enforcement countermeasures such as bicycle stop sign running enforcement. However, the Project does not propose these improvements since these countermeasures are not feasible for a standalone Project.

There are no recommended Project improvements at this unsignalized study area intersection.

Climate Action Plan Compliance: **Transportation Demand Management Program**

To ensure compliance with the City of San Diego Climate Action Plan (CAP Checklist, Strategy 3, item 7) requirement to reduce Single Occupant Vehicle (SOV) travel and associated parking demand, the Project will implement the following TDM measures:

- Parking Cash Out Program: The Project will implement a parking cash out program for all employees to incentivize employees to carpool, vanpool, bike to work, or use public transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities of at least $30 per month.
- The commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees.
- On-Site Bikesharing: On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- Access to Services that Reduce the Need to Drive: The Project will provide an on-site gym (available only to employees) which will reduce the need to drive and encourage walking trips. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

Active Transportation Improvements

As a part of this report, in addition to the LOS analyses, the multi-modal network in the influence area of the Project study area was also reviewed. This includes active transportation modes such as Pedestrian, Bicycle, and Transit mobility. The following is a list of Active Transportation improvements and enhancements that will be provided by the project:

Pedestrian:

To promote pedestrian mobility, the Project proposes the following pedestrian enhancements:

- The Project will provide an on-site gym (available only to employees) which will reduce the need to drive. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

Bicycle:

To promote bicycle mobility, and satisfy the Complete Communities: Mobility Choices regulations and Climate Action Plan Consistency Checklist requirements, the Project proposes the following bicycle features:

- The Project will provide an on-site bicycle repair station.
- The Project will provide a minimum of five (5) electric bicycle charging stations / micro mobility charging stations that are available to the public.
- The Project will provide short-term bicycle parking spaces available to the public, at least 10% beyond minimum requirements. The minimum required per the SDMC is zero (0) spaces and three (3) spaces will be provided.
- The Project will provide long-term bicycle parking spaces at least 10% beyond minimum requirements. The minimum required per the SDMC is twenty-one (21) spaces and twenty-four (24) spaces will be provided.
- The Project will provide three (3) on-site showers and 11 two-tier lockers.
- On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- Class II bike lanes are proposed along Science Park Road by One Alexandria Square Project (PTS 660043) and along Torreyana Road by One Alexandria Square-7 Project (PTS 1057530).
- The Project will implement a parking cash out program for all employees to incentivize employees to bike to work. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

Transit:

The following transit-related features will be provided by the Project to satisfy the Climate Action Plan Consistency Checklist requirements:

- The Project will provide an on-site multi-modal information kiosk in the lobby.
- The Project will implement a parking cash out program for all employees to incentivize employees to use public transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

SECTION—TABLE # **PAGE**

LOCAL MOBILITY ANALYSIS

11011 TORREYANA PROJECT

San Diego, California
April 2024

1.0 INTRODUCTION

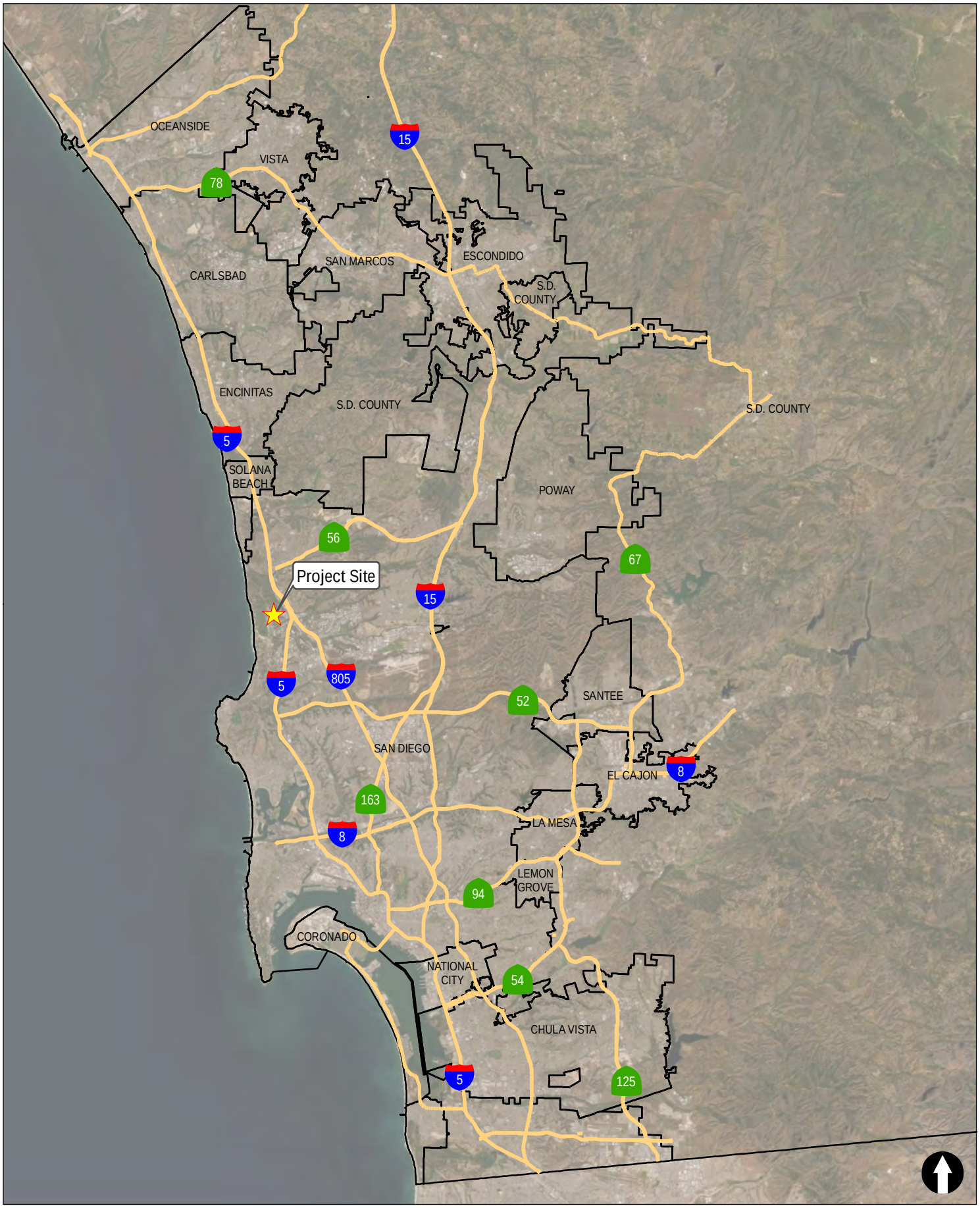
Linscott, Law & Greenspan, Engineers (LLG) has prepared this Local Mobility Analysis (LMA) for the 11011 Torreyana Project (hereby referred to as the "Project"). The Project site is located at the terminus of Torreyana Road, north of Callan Road within the University Community Plan area in the City of San Diego.

The Project proposes to demolish 76,694 SF of Research and Development space and build 152,080 SF of Research and Development space. The site's existing use is currently occupied and operational. Redevelopment of the Project requires Coastal and Site Development permits. The anticipated opening year is 2026.

Figure 1–1 includes a Project vicinity map and ***Figure 1-2*** includes a Project area Map.

The following items are included in this transportation study:

- Project Description
- Study Approach and Methodology
- Existing Mobility Conditions
- Existing Analysis
- Trip Generation, Distribution, and Assignment
- Cumulative Projects Discussion
- Opening Year 2026 Analysis
- Site Access, Circulation and Parking
- Systemic Safety Review
- Climate Action Plan (CAP) Compliance: Transportation Demand Management (TDM)
- Supplemental Intersection Analysis
- Project Effects and Recommendations



LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 10/31/2022
Time: 10:44 AM

Figure 1-1

Vicinity Map

11011 Torreyana Project

LINSCOTT LAW & GREENSPAN engineers

N:\3529\Figures
Date: 11/03/22

Figure 1-2

Project Area Map

11011 TORREYANA PROJECT

2.0 PROJECT DESCRIPTION

2.1 Project Location

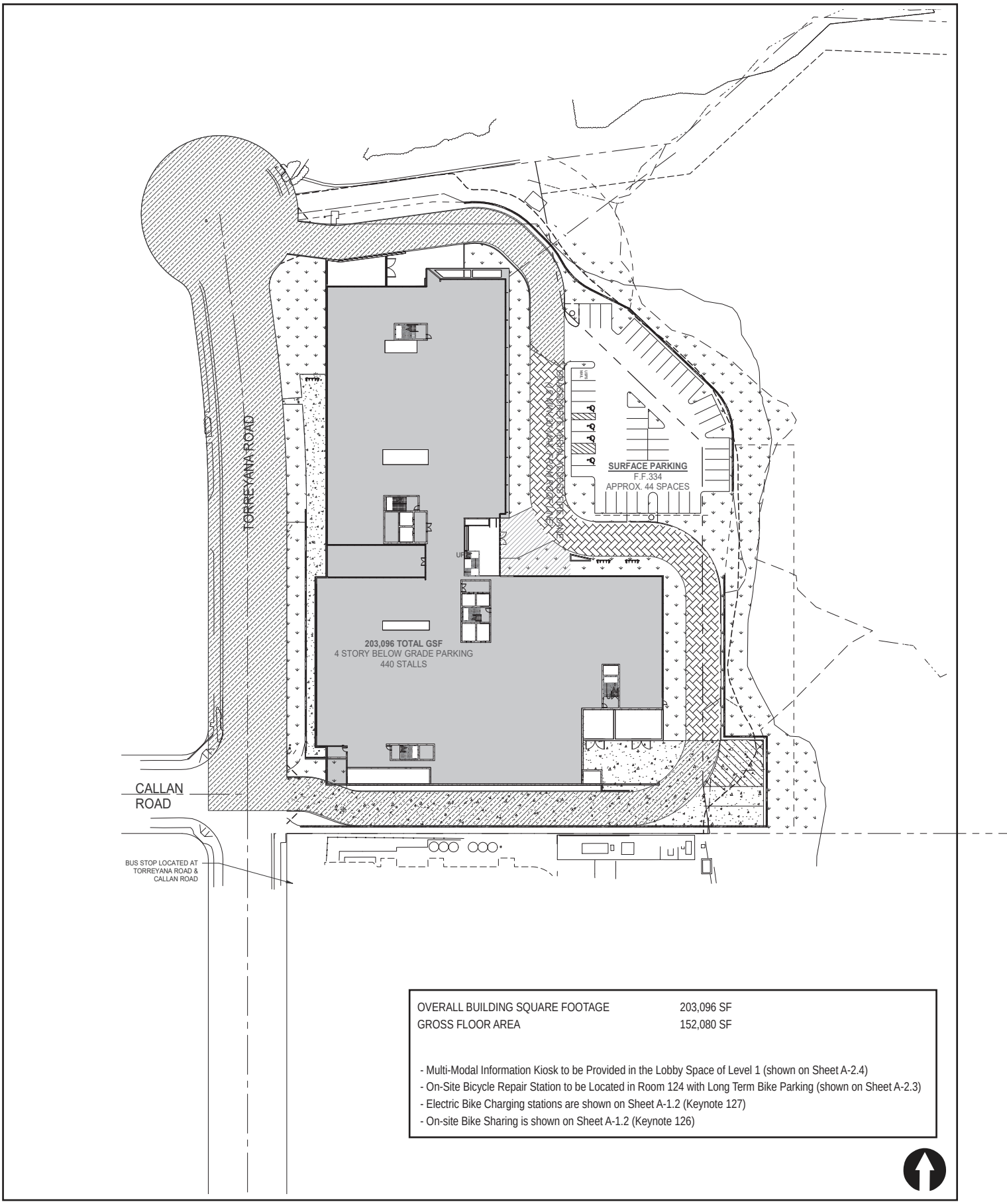
The Project site is located at the terminus of Torreyana Road, north of Callan Road within the University Community Plan area in the City of San Diego.

Access to the site is proposed via two driveways off of Torreyana Road. The southern driveway is proposed opposite Callan Road, forming the fourth leg of the Torreyana Road / Callan Road intersection, and will be used solely for deliveries and fire access. The northern driveway, which currently serves the site, will remain and serve as the primary day-to-day access point.

2.2 Project Description

The Project proposes to demolish 76,694 SF of Research and Development space and build 152,080 SF of Research and Development space. The site's existing use is currently occupied and operational. Redevelopment of the Project requires Coastal and Site Development permits. The anticipated opening year is 2026.

Figure 2–1 depicts the proposed site plan.



OVERALL BUILDING SQUARE FOOTAGE	203,096 SF
GROSS FLOOR AREA	152,080 SF

- Multi-Modal Information Kiosk to be Provided in the Lobby Space of Level 1 (shown on Sheet A-2.4)
- On-Site Bicycle Repair Station to be Located in Room 124 with Long Term Bike Parking (shown on Sheet A-2.3)
- Electric Bike Charging stations are shown on Sheet A-1.2 (Keynote 127)
- On-site Bike Sharing is shown on Sheet A-1.2 (Keynote 126)

LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 04/24/24

Figure 2-1

Site Plan

11011 TORREYANA PROJECT

3.0 STUDY APPROACH AND METHODOLOGY

This section discusses the LMA study objectives, and the analysis approach and methodology used in the preparation of the study.

3.1 Report Approach

In conformance with Senate Bill 743 (SB 743), under a separate cover, a Transportation Impact Analysis was prepared that evaluates the Project's transportation impacts using a Vehicle Miles Traveled (VMT) metric under CEQA, per the City of San Diego's Transportation Study Manual (September 2022), pursuant to guidance from the Governor's Office of Planning and Research (OPR) in December 2018.

This report is a Local Mobility Analysis (LMA) that evaluates the Project's traffic effect on mobility, access, and circulation in the study area. The LMA has the following objectives per the City of San Diego Transportation Study Manual (TSM, September 2022):

- Ensures that the project proposed improvements that will be implemented are consistent with those identified in the Community Plan and support multi-modal circulation and access are constructed at the time when the project triggers the need for them.
- Identifies improvements needed to support and promote active transportation and transit modes.
- Ensures the project provides connections to the active transportation network and transit system.

3.2 Project Study Area

The study area was determined based on the criteria identified in the TSM.

Intersections

Per the TSM guidelines, the following is a description of the study intersections criteria for projects that generate less than 2,400 daily final driveway trips:

- Signalized Intersections located within ½ mile path of travel distance measured from the center of the intersection formed by each project driveway where the project will add 50 or more peak hour cumulative trips to any turning movement at the intersection.
- Unsignalized Intersections (side street stop controlled, all-way stop controlled, or roundabouts) and unsignalized project driveways located within ½ mile path of travel distance measured from the center of the intersection formed by each project driveway where the project will add 50 or more peak hour cumulative trips in either direction.
- All freeway ramp terminal intersections where a project adds 50 or more peak hour final primary (cumulative) (AM or PM) net new trips in either direction must be analyzed regardless of their distance from the project site.

Based on the above criteria, the following intersections are included in the analysis:

1. Torreyana Road / Northern Project Driveway
2. Torreyana Road / Callan Road / Southern Project Driveway
3. N Torrey Pines Place/Callan Road
4. N Torrey Pines Road / Science Park Road
5. Genesee Avenue / I-5 Southbound Ramps
6. Genesee Avenue / I-5 Northbound Ramps

Street Segments

Per the TSM guidelines, since the Project is consistent with the Community Plan, the study area should include any roadway segments where the project adds 1,000 or more daily final primary trips (cumulative trips) AND:

- Have improvements identified in the community plan, OR
- Not built to the community plan ultimate classification (including planned new circulation element roadways).

Based on the above criteria, no roadway segments are included in the study area.

3.3 Study Scenarios

Analysis for the following study scenarios is required per the TSM:

- Existing Conditions
- Opening Year 2026
- Opening Year 2026 + Project

3.4 Analysis Methodology

The analysis methods outlined in the TSM will guide the determination of off-site improvements required to accommodate project traffic in addition to project frontage improvements.

3.4.1 *Pedestrian Analysis*

Per the TSM guidelines, pedestrian analysis should focus on pedestrian connectivity, walkshed analysis, and the presence of adequate facilities.

3.4.2 *Bicycle Analysis*

Per the TSM guidelines, project effects on existing and proposed bicycle facilities should be reviewed in consideration of the following:

- Bicycle analysis should primarily focus on bicycle connectivity, bikeshed analysis, and the presence of adequate facilities.
- Consistency with the City's Bicycle Master Plan and the Community's Bicycle Mobility Element.

- On-site bike parking supply as well as bikeshare bicycles that may be parked/stored on public sidewalks.

3.4.3 *Transit Analysis*

Per the TSM guidelines, project effects on the transportation system should be evaluated in consideration of the following:

- Increased travel time for buses that could adversely effect on-time performance (intersection delay, corridor delay, movement delay (for transit)).
- Conflicts (e.g., weaving, sight distance, etc.) involving buses.
- Planned and/or proposed transit improvements and stops identified in community plans, the RTIP and/or RTP within the study area.

Project effects on transit system ridership is not typically considered an issue but may be evaluated under special circumstances (e.g., new office building along a bus line that already has substantial peak period ridership).

3.4.4 *Intersection Operation Analysis*

Level of service (LOS) is the term used to denote the different vehicular operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis considering factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

Signalized intersections were analyzed under weekday 7:00-9:00 AM and 4:00-6:00 PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 18 of the *2016 Highway Capacity Manual (HCM 6th Edition),* with the assistance of the *Synchro* (version 11) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS. A more detailed explanation of the methodology is attached in ***Appendix A***. ***Table 3–1*** shows the signalized intersection delay categorized for each LOS.

Unsignalized intersections were analyzed under weekday 7:00-9:00 AM and 4:00-6:00 PM peak hour conditions. Average vehicle delay and LOS were determined based upon the procedures found in Chapters 20 and 21 of the *HCM 6,* with the assistance of the *Synchro* (version 11) computer software. A more detailed explanation of the methodology is attached in *Appendix A*. *Table 3–1* shows the unsignalized intersection delay categorized for each LOS.

TABLE 3–1
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: Highway Capacity Manual

3.4.5 *Systemic Safety Review*

Study intersections should be compared to the City of San Diego Systemic Safety: The Data-Driven Path to Vision Zero 7 report to determine if a study intersection meets any hot spot criteria. If a study intersection meets any of the criteria, the applicant should evaluate any potential countermeasures and coordinate with the Development Services Department Transportation Development Section staff to determine appropriate intersection improvements.

3.5 Identifying Off-Site Improvements

Based on the TSM, off-site improvements to accommodate project traffic that address access, circulation and safety for all modes should be determined using the following analysis methods for each type of improvement:

3.5.1 *Pedestrian Facilities*

- Closing Sidewalk Gaps/Removing Obstructions:
  - The project should construct sidewalks to close sidewalk gaps adjacent to the project site.
  - The project should remove sidewalk obstructions that constrain pedestrian access route to less than four feet adjacent to the project site.
  - The project should construct curb ramp/meet accessibility standards for any intersections adjacent to the project site.
- Accommodating Pedestrian Demand:
  - The project should consider adding traffic calming and pedestrian-related signal timing changes to accommodate an increase in pedestrian demand on roadways and intersections adjacent to the project site.

3.5.2 *Bicycle Facilities*

- Accommodating Bicycle Demand:
  - The project should construct any planned bicycle facility per the Community Plan or Bicycle Master Plan.
  - The project should consider upgrading bicycle facilities by adding upgrade treatments to accommodate an increase in bicycle demand.

3.5.3 *Transit Facilities*

- Transit Priority Treatments/Improvements:
  - The project should consider transit priority treatments when operational analysis determines a transit movement would experience LOS E or worse.
  - The project should consider transit priority treatments identified within the Community Plan for the study area.
- Proposed Transit Stops:
  - The project should consider accommodating transit stops to serve existing or proposed transit services, including those identified in the Community Plan, RTIP and/or RTP within the study area. The project should coordinate any identified transit stops with SANDAG, the Metropolitan Transit System (MTS) and/or the North County Transit District (NCTD).
- Transit Stop Amenities:
  - The project should coordinate with MTS and/or the NCTD, as applicable, to determine additional or upgraded transit stop amenities.

3.5.4 *Signalized Intersections*

Based on the TSM, signal timing improvements/signal modifications should be considered if the following criteria is met for study intersections:

- Within ½ mile path of travel of a Major Transit Stop: if the project causes an intersection to degrade to LOS F, or if the project adds traffic to a signal already operating at LOS F.
- Outside of a ½ mile path of travel a Major Transit Stop: if the project causes an intersection to degrade to LOS E or F, or if the project adds traffic to a signal already operating at LOS E or F.

Additionally, the following adding or lengthening of a turn lane criteria should be considered:

- Left Turn Lane:
  - Per the TSM guidelines No Existing Left-Turn Lane: If the project adds traffic to an individual left turn movement causing the total number of peak hour left turns to exceed 100, consider adding a left turn lane.
  - Existing Single Left-Turn Lane: If the project adds traffic to an individual left turn movement causing the total number of peak hour left turns to exceed 300, consider adding a second left turn lane.

- Right Turn Lane:
  - No Existing Right-Turn Lane: If the addition of a right turn lane will not negatively affect other roadway users, will maintain a comfortable roadway environment, AND the project adds traffic to an individual right turn movement causing the total number of peak hour right turns to exceed 500, consider adding a right turn lane.
  - Existing Single Right-Turn Lane: If the addition of a right turn lane will not negatively affect other roadway users, will maintain a comfortable roadway environment, AND the project adds traffic to an individual right turn movement causing the total number of peak hour right turns to exceed 800, consider adding a second right turn lane. In addition to the considerations previously stated, dual-right turn (or more) treatments may require supplementary improvements including but not limited to no right-turn on red with blank-out signs, lead pedestrian intervals (LPIs) for pedestrians and cycle track treatment for bicyclists.
- Lengthening a Turn Pocket Evaluation
  - If the project adds traffic to a turning movement and causes the 95th percentile queue to exceed the available turn pocket length, consider lengthening the turn pocket.

3.5.5 *Unsignalized Intersections*

- Considerations for intersections improvements: When considering intersection improvements for circulation, access, and safety for all modes, factors that should be considered include, but are not limited to, conflicting pedestrian movements, existing and proposed bicycle facilities, transit priority, protected or permissive turn movement phasing, number of lanes, speed of prevailing traffic and expected queue lengths.

- Constructing a Roundabout or Traffic Signal at an all-way stop-controlled intersection: If the project causes the operations at an all-way stop-controlled intersection to degrade (see below), perform an intersection control evaluation that includes a signal warrant analysis and a roundabout LOS analysis. Prepare a roundabout conceptual layout (prepared by a consultant qualified/experienced in roundabout design) to determine the geometric impact of a roundabout. Coordinate with Development Services Department Transportation Development Section staff on appropriate intersection control improvement. Staff may request additional lifecycle safety and mobility.

  The intersection control evaluation should be prepared if the project causes an all-way stop-controlled intersection to degrade as follows:
  - Within a 1/2-mile path of travel of a Major Transit Stop: If the project causes an all-way stop-controlled intersection located to degrade to LOS F, or if the project adds traffic to an all-way stop-controlled intersection already operating at LOS F.
  - Outside of a 1/2-mile path of travel of a Major Transit Stop: If the project causes an all-way stop-controlled intersection to degrade to LOS E or F, or if the project

adds traffic to a adds traffic to an all-way stop controlled intersection already operating at LOS E or F.

- Constructing a Roundabout or Traffic Signal at a side-street stop-controlled intersection: If the project causes the operations at a side-street stop-controlled intersection to degrade (see below), perform an intersection control evaluation that includes a signal warrant analysis and a roundabout LOS analysis. Prepare a roundabout conceptual layout (prepared by a consultant qualified/experienced in roundabout design) to determine the geometric impact of a roundabout. Coordinate with Development Services Department Transportation Development Section staff on appropriate intersection control improvement. Staff may request additional lifecycle safety and mobility.

  The intersection control evaluation should be prepared If the project causes a side-street stop-controlled intersection to degrade as follows:
  - Within a 1/2-mile path of travel of a Major Transit Stop: If the project causes the worst movement of a side-street stop-controlled intersection to degrade to LOS F, or if the project adds traffic to the worst movement of a side-street stop-controlled intersection that is already operating at LOS F.
  - Outside of a 1/2-mile path of travel of a Major Transit Stop: If the project causes the worst movement of a side-street stop-controlled intersection to degrade to LOS E or F, or if the project adds traffic to the worst movement of a side-street stop-controlled intersection that is already operating at LOS E or F.

4.0 EXISTING MOBILITY CONDITIONS

This section presents the Project's study area and describes existing roadway conditions within the Project area. ***Figure 4–1*** shows the existing conditions diagram.

4.1 Existing Roadway Network

The following is a description of the existing roadway network in the study area.

North Torrey Pines Road is classified in the *University Community Plan* as a 6-lane Primary Arterial between Genesee Avenue and Callan Road, and as a 5-lane Major Street north of Callan Road. Currently, N. Torrey Pines Road is constructed to its buildout classification between Genesee Road and north of Callan Road. Non-contiguous sidewalks are provided along the west side of the roadway and contiguous sidewalks are provided on the east side. Additionally, Class II Bike Lanes are provided, and parking is prohibited on both sides of the roadway. The posted speed limit within the project vicinity is 45 miles per hour (mph) northbound and 50 mph southbound.

Torreyana Road is not a classified roadway in the *University Community Plan,* but functions as a two-lane collector. It is currently constructed as a 2-lane undivided roadway. Contiguous sidewalks are provided, and parking is permitted on both sides of the roadway. Bike lanes are not provided. The speed limit is not posted within the project vicinity but is assumed to be 25 mph based on the roadway characteristics and the surrounding roadways.

Callan Road is not a classified roadway in the *University Community Plan,* but functions as a two-lane collector. It is currently constructed as a 2-lane undivided roadway. Contiguous sidewalks are provided, and parking is permitted on both sides of the roadway. Bike lanes are not provided. The posted speed limit within the project vicinity is 25 mph.

Science Park Road is not a classified roadway in the *University Community Plan,* but functions as a two-lane collector. It is currently constructed as a 2-lane undivided roadway. Contiguous sidewalks are provided, and parking is permitted on both sides of the roadway, however, bicycle facilities are not provided.

Genesee Avenue is classified in the *University Community Plan* as a 6-lane Primary Arterial roadway. Genesee Avenue is currently constructed to its buildout classification within the project study area. Contiguous sidewalks are provided on both sides of the roadway between N. Torrey Pines Road and John Jay Hopkins Drive and east of I-5 SB ramps, and only on the north side of the roadway between John Jay Hopkins Drive and I-5 SB ramps. Class II Bike Lanes are provided, and parking is prohibited on both sides of the roadway. The posted speed limit within the project vicinity is 50 mph.

4.1.1 *Existing Traffic Volumes*

Existing weekday daily street segment counts and AM and PM peak hour (7:00-9:00 AM and 4:00-6:00 PM) intersection counts (including bicycle and pedestrian counts) were conducted on Tuesday,

October 29, 2019, and on Wednesday, November 13, 2019, while local schools were in regular session. These traffic counts were taken from the One Alexandria Square Project prepared by Rick Engineering, January 2022 (PTS #660043) and an annual growth rate of 1.27% per year for four years (5.06% total) to 2023 was applied based on SANDAG ABM2+ 2016 to 2025. ***Appendix B*** contains the traffic count sheets. ***Figure 4–2*** shows the existing traffic volumes.

4.2 Existing Pedestrian Mobility

A pedestrian network inventory was conducted along street segments within a ½ mile walking distance of the Project. This included documenting missing sidewalks, pedestrian barriers, and pedestrian pathways. ***Figure 4–3*** shows the existing pedestrian network within the immediate vicinity of the Project. As shown, sidewalks are currently provided in both directions of travel along the study area roadways. Continental style pedestrian crosswalks are provided at the signalized North Torrey Pines Road / Science Park Road intersection across the north leg (North Torrey Pines Road) and the east leg (Science Park Road). Continental-style pedestrian crosswalks are also provided at the signalized intersection of Genesee Avenue / I-5 NB Ramp across the north and south legs (Genesee Avenue).

4.2.1 *Existing Pedestrian Activity*

Existing pedestrian counts were conducted at the study intersections during the commuter AM/PM peak hours as shown in *Appendix B*. ***Figure 4–4*** shows the existing pedestrian counts within the Project study area.

4.2.2 *Walkshed Analysis*

A walkshed analysis was performed to evaluate the pedestrian connectivity in the vicinity of the Project site and to ensure the Project provides the appropriate pedestrian facilities.

The walkshed analysis was performed by identifying pedestrian access points to / from the Project considering topography constraints. From each access point, parcels outside the Project site that could be reached by walking ½- mile were identified. Selected walking routes from each access point consider the existence of crosswalks, pedestrian bridges, etc. In this regard, while some areas are located within the ½-mile radius around the Project site, they may not be reached by walking due to rail crossings and freeways. After creating the walkshed network, the area that could be captured by walking was measured. A larger walkshed area (walkshed network) means higher connectivity between the Project site and nearby areas.

Figure 4–5 shows the Project's walkshed with the existing pedestrian network. The Project walkshed includes points of interest including multiple cafés, restaurants, and a barber shop.

4.3 Existing Bicycle Mobility

This section presents the bicycle network in the Project study area and includes a bikeshed analysis to ensure the Project provides the appropriate bicycle facilities. Proposed measures to enhance bicycle mobility are also presented.

4.3.1 *Bicycle Facility Classifications*

Within the City of San Diego, there are four bicycle facility classifications: Class I, Class II, Class III and Class IV as shown in ***Table 4–1.***

TABLE 4–1
BICYCLE FACILITY CLASSIFICATIONS

Class I refers to exclusive **bike paths**, also termed shared-use or multi-use paths, for exclusive use by bicyclists, pedestrians, and those using non-motorized modes of travel. They are physically separated from vehicular traffic and can be constructed in roadway right-of-way or exclusive right-of-way. Bike paths provide critical connections where roadways are absent or are not conducive to bicycle travel.

Class II refers to **bicycle lanes** defined by pavement striping and signage used to allocate a portion of a roadway for bicycle travel. Bike lanes are one-way facilities on either side of a roadway. A painted buffer can separate bikes from vehicles or parking lanes. Green paint can identify conflict zones.

Class III refers to bike routes that share use with motor vehicle traffic within the same travel lane. Bike routes are identified with signage and street markings known as "sharrows" or shared lane markings to delineate that the road is a shared-use facility.

Class IV refers to a **Cycle Track**, which is a hybrid type bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks are bikeways located in roadway right-of-way but separated from vehicle lanes by physical barriers, flexible posts, on-street parking curbs, or other objects. Cycle tracks provide for one-way or two-way bicycle travel and are exclusively for bicycle use.

4.3.2 *Existing Bicycle Mobility*

A detailed bicycle network inventory was conducted for the surrounding study area. North Torrey Pines Road currently has Class II bike lanes that are provided in both directions of travel. There is a 250-foot-long section on northbound North Torrey Pines Road approaching John Jay Hopkins Drive where no Class II bike lane is provided, and Class III "sharrow" pavement markings are provided within the northbound right-turn lane at the North Torrey Pines Road / John Jay Hopkins Drive intersection. The northbound Class II bike lane is marked with green paint at several conflict zones to provide higher visibility.

Genesee Avenue currently has Class II bike lanes that are provided in both directions of travel. The southbound Class II bike lane is marked with green paint at several conflict zones to provide higher visibility.

Table 4–2 summarizes the existing and planned bicycle classifications on the study street segments. ***Figure 4–6*** presents the existing bicycle network in the Project study area.

TABLE 4–2
BICYCLE FACILITY

Street Segment	Existing Classification	Planned Classification per draft University CPU
N. Torrey Pines Road		
Genesee Avenue to north boundary of Torrey Pines Science Park	Class II bike lanes	Class IV (one-way) Cycle Track
Genesee Avenue		
North Torrey Pines Road to Science Center Dr	Class II bike lanes in both directions	Class IV (one way) cycle track with two lanes
Science Center Dr to I-5	Class II bike lanes in both directions	Class II (SB)/Class IV (one way) cycle track with two lanes (NB)

4.3.3 *Existing Bicycle Activity*

Existing bicycle counts were conducted at the study intersections during the commuter AM/PM peak hours as shown in *Appendix B*. ***Figure 4–7*** shows the existing bicycle counts within the Project study area.

4.3.4 *Bikeshed Analysis*

A bikeshed analysis was performed to evaluate bicycle connectivity in the vicinity of the Project site and to ensure the Project provides the appropriate bicycle facilities.

The bikeshed analysis was performed by identifying all access points to / from the Project. From each access point, areas outside the Project site that could be reached by biking 1/2 mile were identified. Selected biking routes from each access point consider the presence of bike routes, lanes,

and dedicated pathways. In this regard, while some areas are located within the 1/2-mile buffer around the Project site, they may not be reached by bike due to rail crossings and freeways. A larger bikeshed area (bikeshed network) means higher connectivity between the Project site and nearby areas.

Figure 4–8 shows the Project's bikeshed with the existing bicycle network. The Project bikeshed includes points of interest including multiple cafés, restaurants, and a barber shop.

4.4 Transit Mobility

This section presents the existing transit conditions in the Project study area. ***Figure 4–9*** shows the existing transit network.

4.4.1 *Bus Service*

North County Transit District (NCTD) and Metropolitan Transit Service (MTS) currently provide the following transit bus routes within the study area:

NCTD Route 101 provides service from Oceanside Transit Center to UTC Transit Center. The route is in service from 5:00 AM to 11:30 PM with peak hour headways of 30 minutes and off-peak hour headways of 1 hour. The route has 2 stops within the project vicinity located at N. Torrey Pines Road and Scripps Clinic S. Driveway.

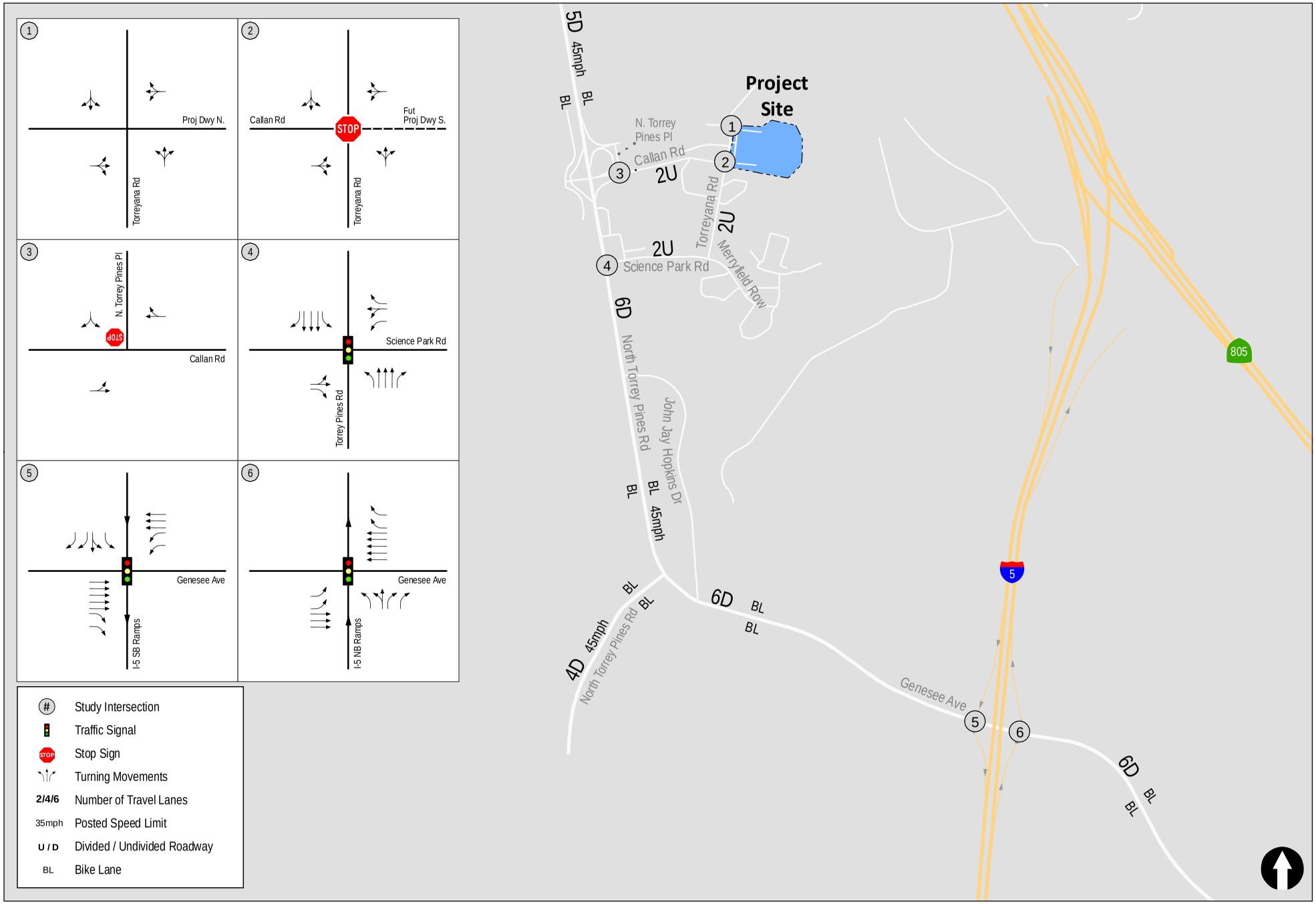
MTS Route 978 provides service from Sorrento Valley COASTER station to the Torrey Pines business area. The route provides service during weekdays only from 6:30 AM to 6:30 PM. Headways are 40 minutes during AM hours and 1 hour during PM hours.

MTS Route 985 provides service from Torrey Pines to UCSD Central Campus. The route is in service during weekdays only from 6:15 AM to 7:30 PM. Headways are 15 minutes during peak hour periods and 30 minutes during off-peak hour periods.

4.4.2 *Train Service*

The Project site is located 3.5 miles from the Sorrento Valley Station, which is served by the COASTER.

The COASTER runs between San Diego Santa Fe Depot and Oceanside. There is a total of eight (8) stops along this route. COASTER service provides thirty (30) daily trips on the weekdays with an additional two (2) trips on Fridays. It also provides twenty (20) daily weekend trips. Weekday service begins at 5:16 AM with 20 to 120-minute headways and ends at 8:37 PM with the exception on Friday which has one extra trip and ends at 10:17 PM. Weekend service begins at 7:36 AM with 80 to 100-minute headways and ends at 10:17 PM. ***Appendix C*** includes the bus timetables.



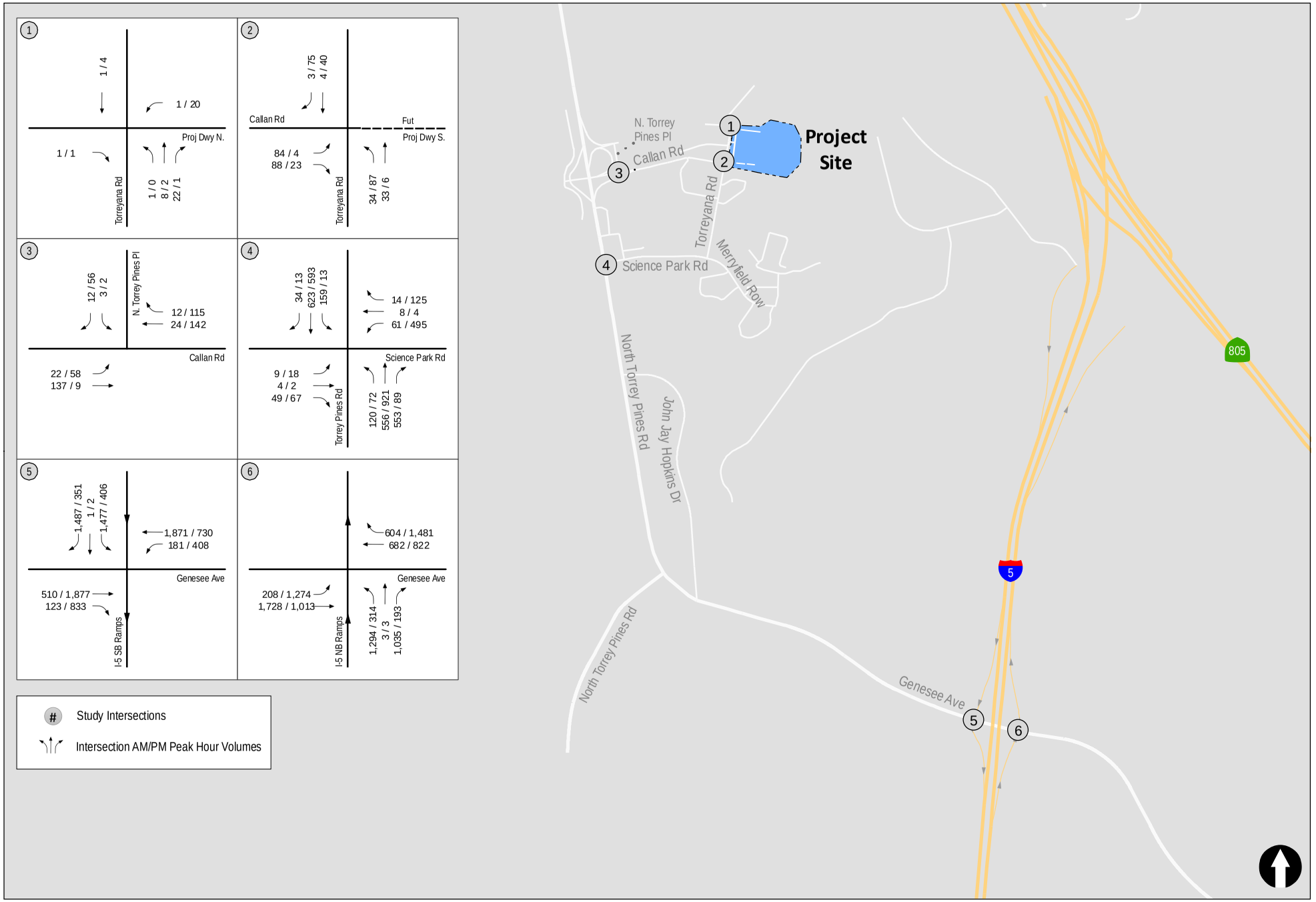
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 4/4/2023
Time: 9:24 AM

Figure 4-1

Existing Conditions Diagram

11011 Torreyana Project

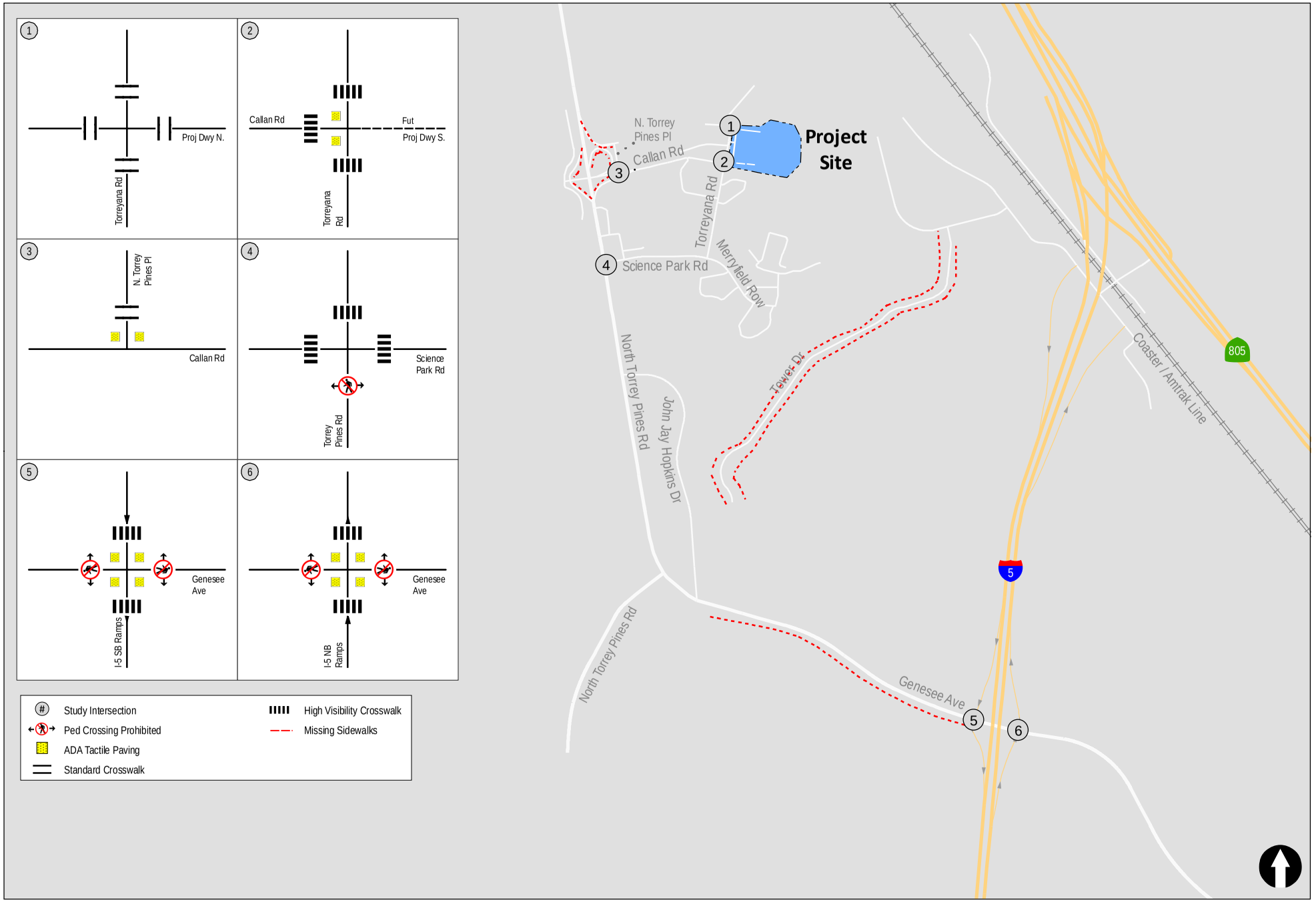


N:\3527\Figures
Date: 4/10/2023
Time: 10:34 AM

Figure 4-2

Existing Traffic Volumes

11011 Torreyana Project



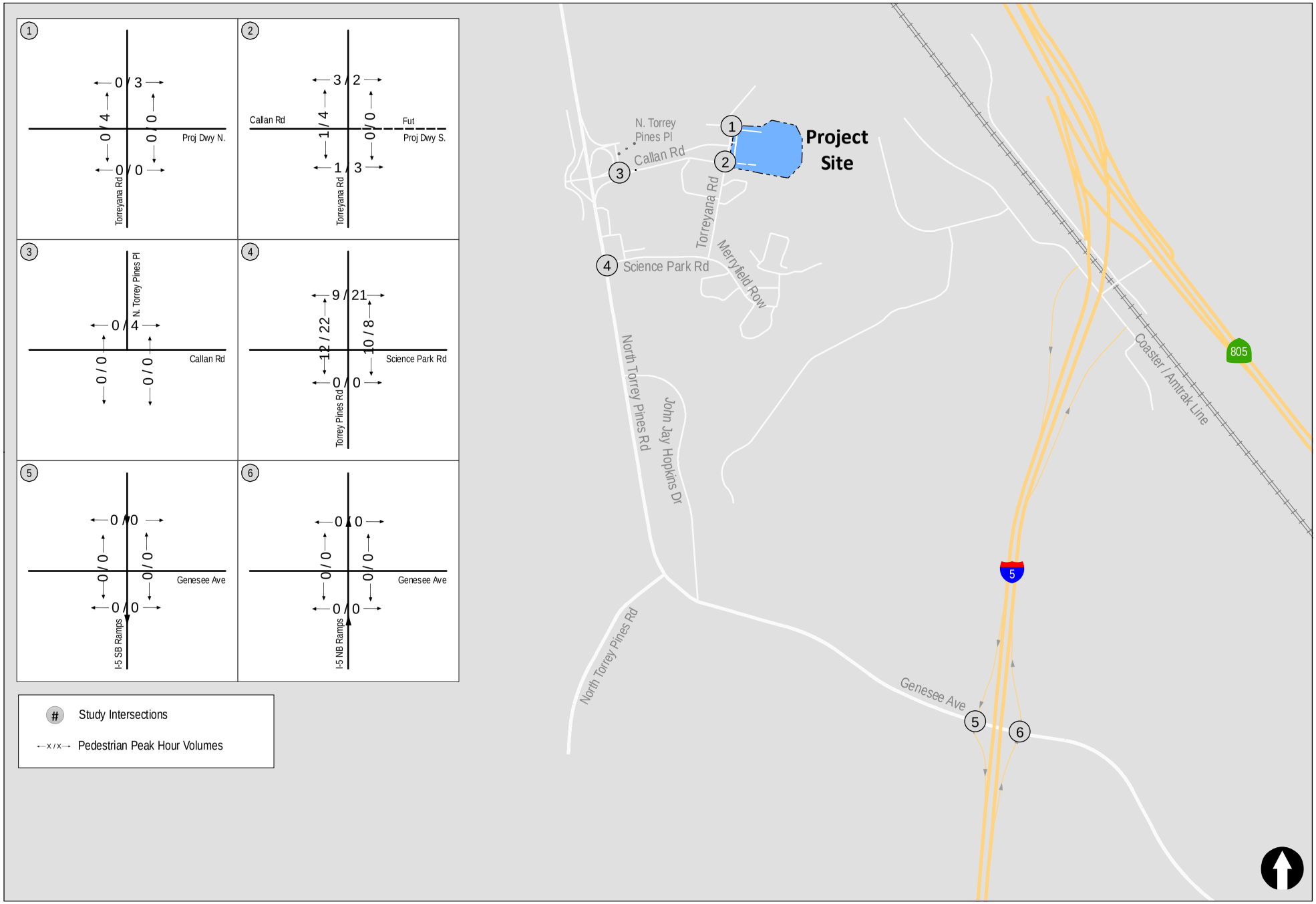
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 10/9/2023
Time: 8:52 AM

Figure 4-3

Existing Pedestrian Network

11011 Torreyana Project



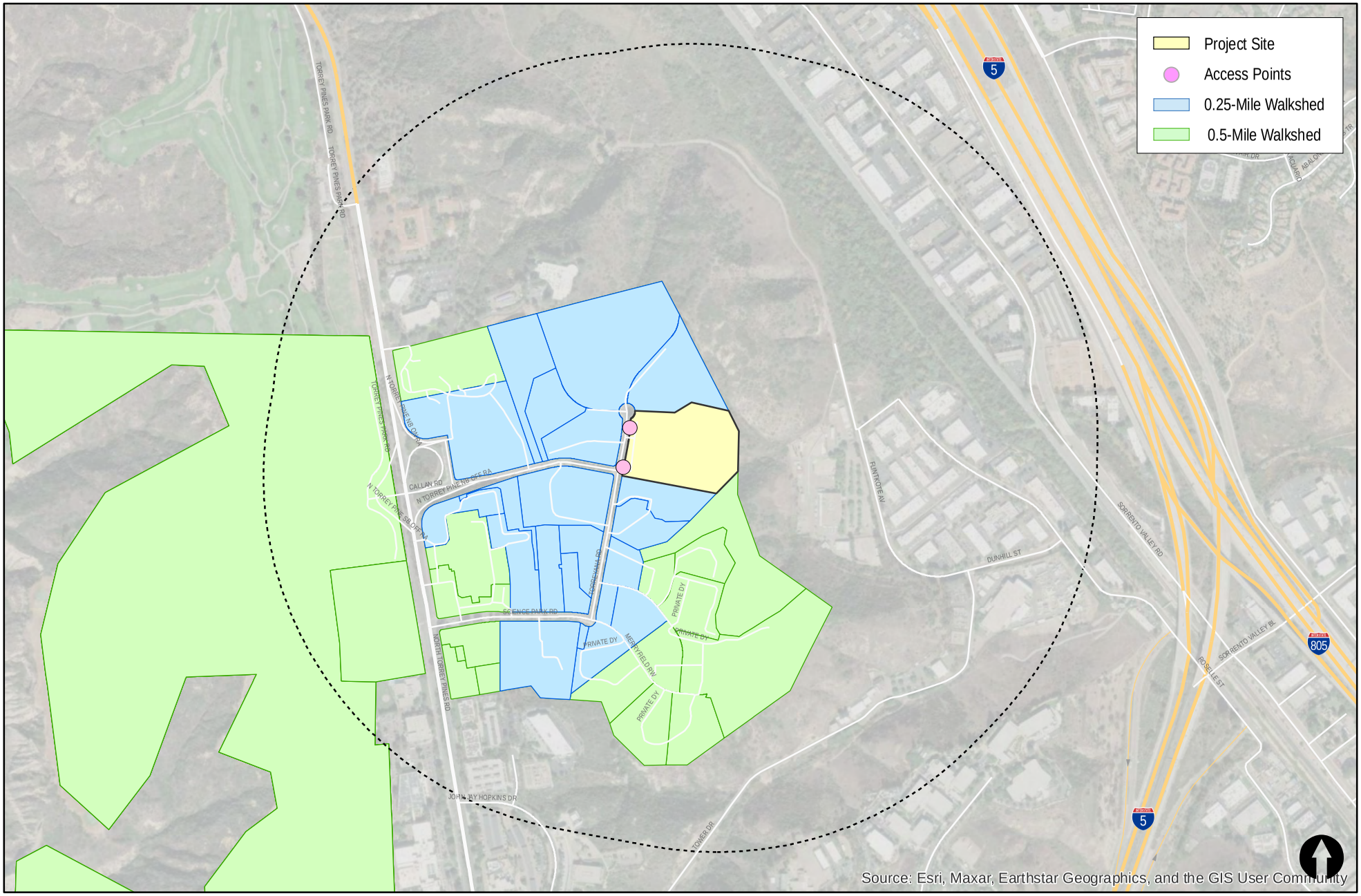
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 8/7/2023
Time: 11:12 AM

Figure 4-4

Existing Pedestrian Activity

11011 Torreyana Project



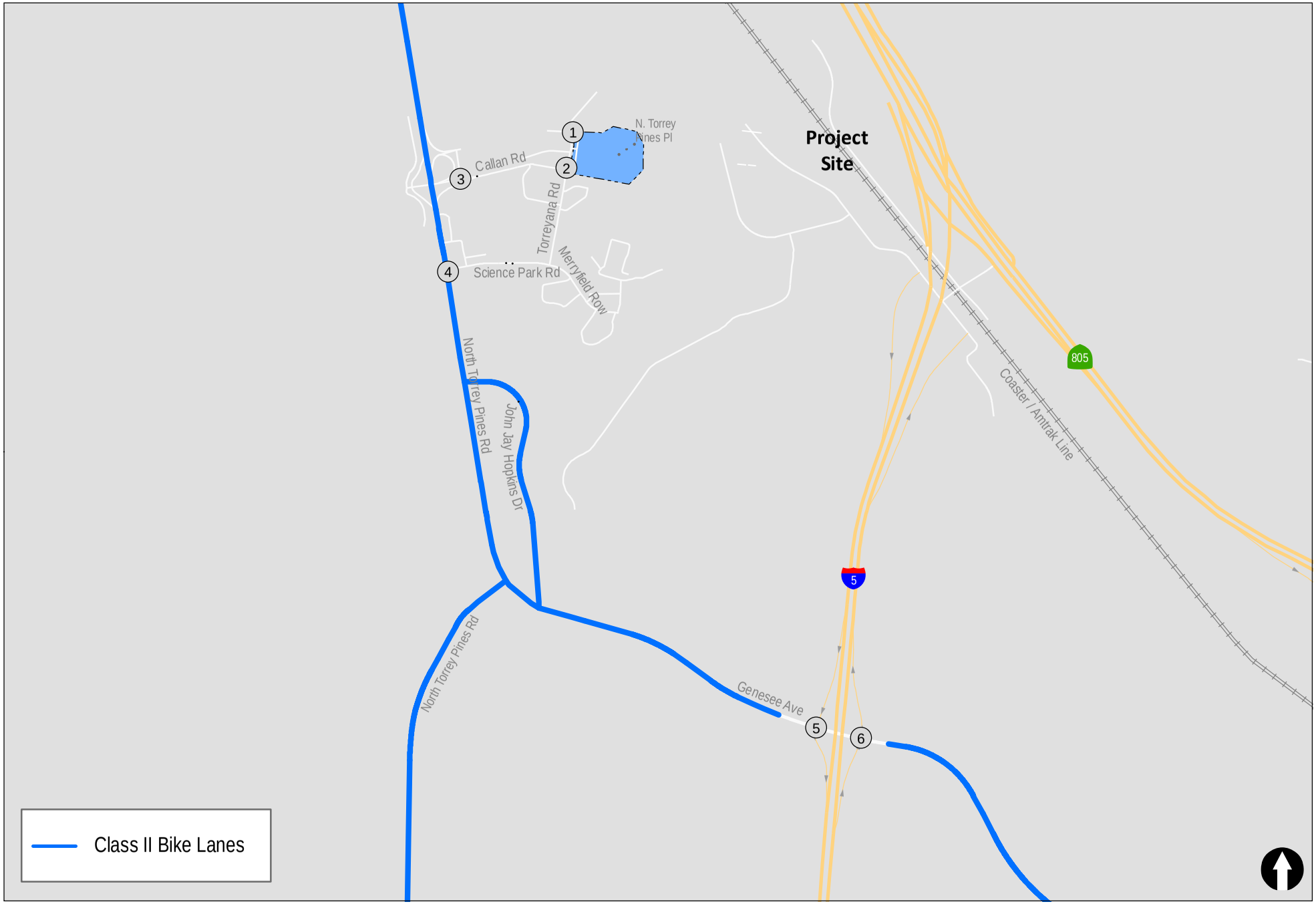
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 04/11/23

Figure 4-5

Walkshed Analysis

11011 Torreyana Project



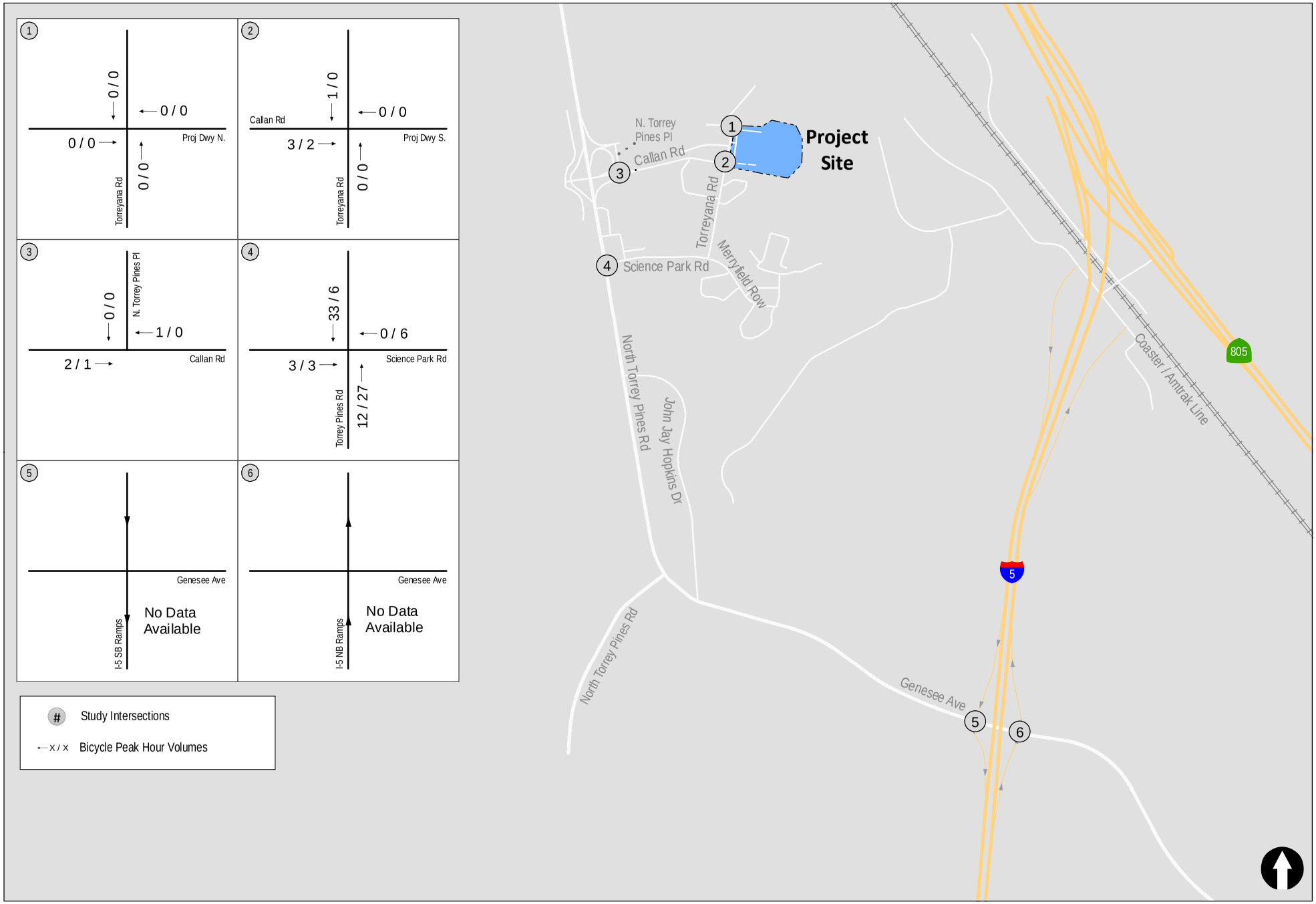
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 8/7/2023
Time: 11:15 AM

Figure 4-6

Existing Bicycle Network

11011 Torreyana Project

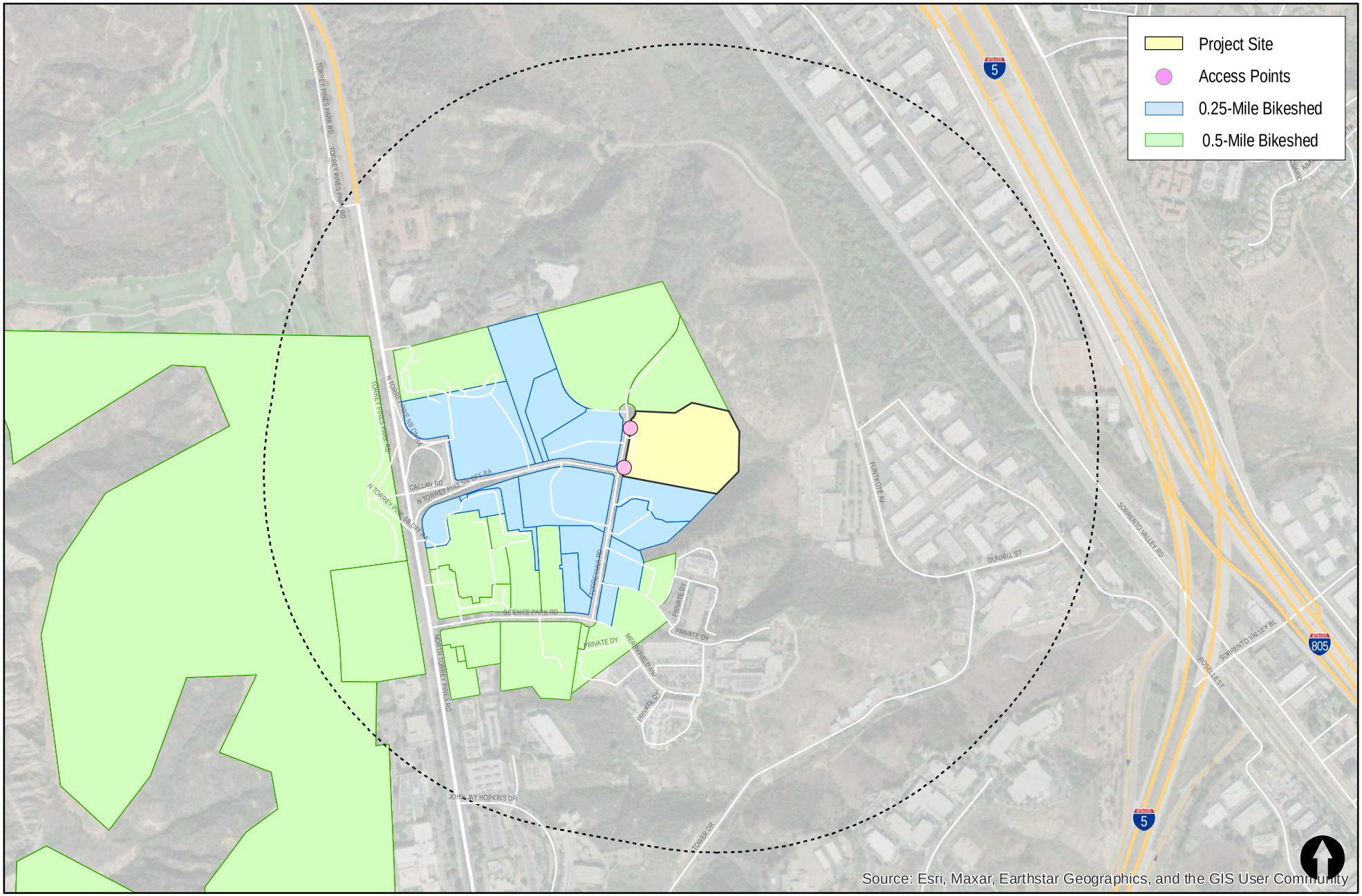


N:\3527\Figures
Date: 8/7/2023
Time: 11:15 AM

Figure 4-7

Existing Bicycle Activity

11011 Torreyana Project



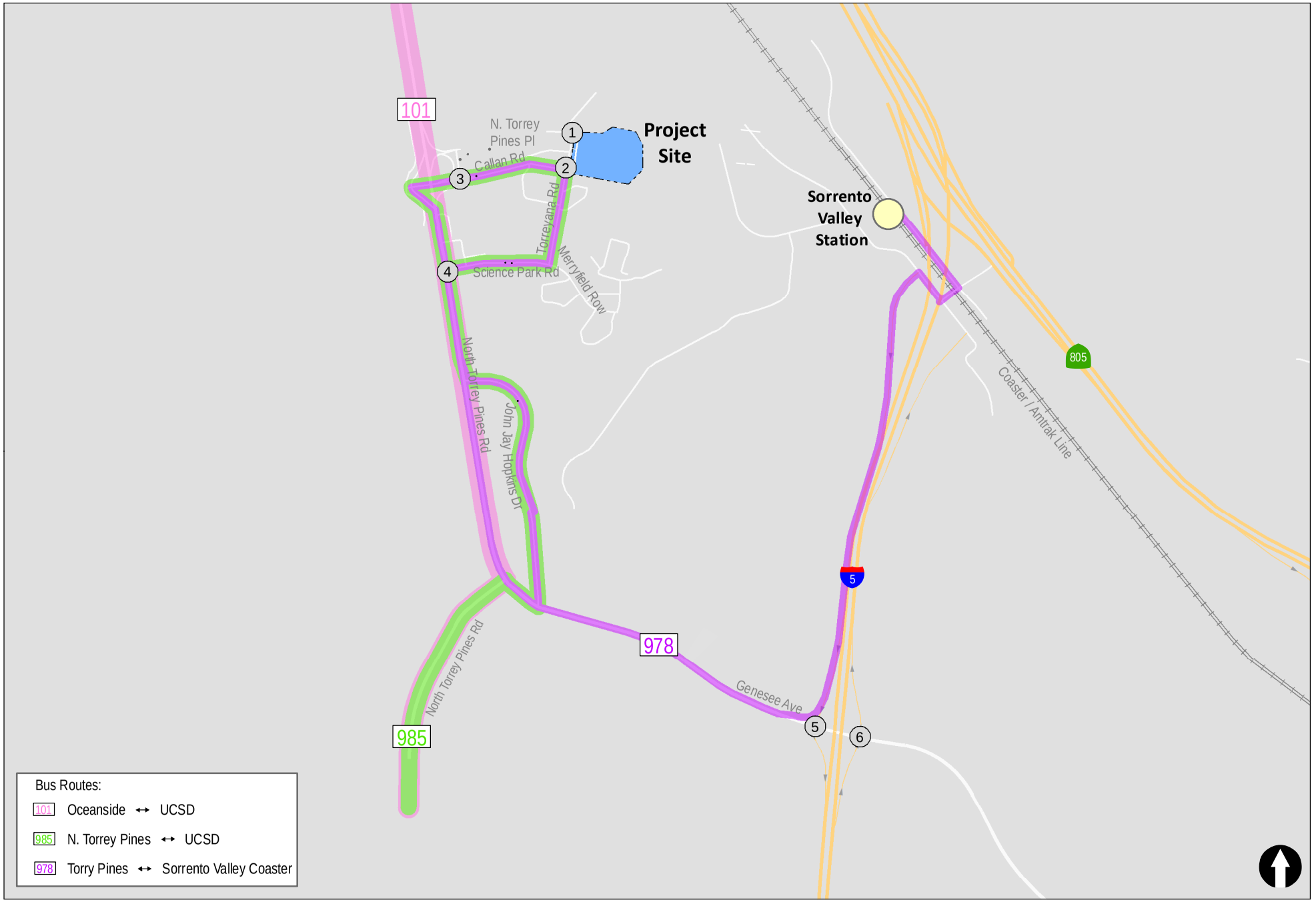
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 04/11/23

Figure 4-8

Bikeshed Analysis

11011 Torreyana Project



LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 8/7/2023
Time: 11:17 AM

Figure 4-9

Existing Transit Network

11011 Torreyana Project

5.0 EXISTING ANALYSIS

The analysis of existing conditions includes the assessment of the study area intersections using the methodologies described in *Section 3.0*. ***Appendix D*** contains the existing signal timing plans.

5.1 Peak Hour Intersection Operations

Table 5–1 summarizes the existing peak hour intersection operations. As seen in *Table 5–1*, the following intersection is calculated to currently operate at LOS E or F:

- #5: Genesee Avenue / I-5 SB Ramps (LOS E during the AM peak hour)
- #6: Genesee Avenue / I-5 NB Ramps (LOS F during the PM peak hour)

Appendix E contains the intersection analysis worksheets for the Existing scenario.

TABLE 5–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. Torreyana Road / Northern Project Driveway	MSSC[c]	AM PM	8.8 8.8	A A
2. Torreyana Road / Callan Road / Southern Project Driveway	AWSC[d]	AM PM	7.9 7.5	A A
3. N. Torrey Pines Place / Callan Road	MSSC[c]	AM PM	8.8 9.8	A A
4. Torrey Pines Road / Science Park Road	Signal	AM PM	24.3 27.7	C C
5. Genesee Avenue / I-5 Southbound Ramps	Signal	AM PM	57.3 20.9	E B
6. Genesee Avenue / I-5 Northbound Ramps	Signal	AM PM	36.6 108.4	D F

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Minor-Street Stop Control. Worst case movement delay is reported.
d. All-Way Stop Control. Average intersection delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

6.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

The section below provides a detailed description of the Project's trip generation.

6.1 Trip Generation

The Project proposes to demolish 76,694 SF of Research and Development space and build 152,080 SF of Research and Development space. Based on the existing and proposed land use type, the rates for "Research and Development" found in the City of San Diego *Trip Generation Manual (May 2003)* were used to calculate the trip generation for the proposed Project.

It should be noted that the Project's trip generation and subsequent analysis contained in this LMA are based on the Project's *total building area* of 203,096 SF. Since the time in which the Project's trip generation and analysis were conducted, the Project's gross floor area was refined to 152,080 SF based on coordination with City staff and using the City of San Diego Municipal Code as a guide to exclude non-occupiable areas. This includes space dedicated to support-type uses (including the cooling tower, refuse/recycling areas, emergency electrical areas, emergency generator/gas storage, SDGE, and others that are typically not located within the building itself), the basement area, and overhang areas, among others, as detailed in ***Appendix L***.

Assuming the Project's total building area of 203,096 in the Project's trip generation calculations and subsequent analysis is a conservative approach as it assumes more occupiable area as compared to the proposed 152,080 SF.

Table 6–1 summarizes the Project's estimated trip generation, assuming the total building area of 203,096 SF As shown in *Table 6–1*, the Project is estimated to generate a net increase of approximately 1,011 net new ADT with 162 net new AM peak hour trips (146 inbound / 16 outbound) and 142 net new PM peak hour trips (14 inbound / 128 outbound).

6.2 Trip Distribution/Assignment

The Project trip distribution was developed based on the approved trip distribution under PTS #660043 (One Alexandria Square Project prepared by Rick Engineering, January 2022) LMA Exhibit 7 for R&D uses, the existing roadway network, existing and anticipated travel patterns, and the surrounding residential and commercial land uses.

Figure 6–1 shows the Project trip distribution percentages. ***Figure 6–2*** shows the Project traffic volumes.

6.3 CPIOZ and Development Intensity

The Project site is within the University Community Plan Implementation Overlay Zone (CPIOZ) Type B. The purpose of the CPIOZ is to provide site specific analysis to ensure consistency with the Development Intensity Element of the community plan. The University Community Plan designates the subject site as a part of Subarea 9. This designation allows Scientific Research uses up to 20,000 SF/acre. The Project proposes a total of 152,080 SF of Scientific Research uses on 10.4 acres, which

equates to approximately 14,623 SF/acre. Therefore, the Project complies with the maximum allowable density of 20,000 SF/acre for Subarea 9.

Also, per the University Community Plan, the site is located within the "Chevron" subarea, which requires development projects to mitigate their *peak hour* trip generation rate to a level equal to or less than that which would be generated by a project of 18,000 SF/acre. Calculating the trip generation for a maximum of 18,000 SF/acre of Scientific Research uses on the site's 10.4 acres equates to approximately 1,498 total ADT with 240 total AM peak hour trips and 210 total PM peak hour trips, as shown on ***Table 6-2***.

The CPIOZ Chevron maximum trip requirement applies to all trips in Subarea 9, and not only the net-new trips attributable to a specific redevelopment project. Therefore, the Project's trip generation calculations for CPIOZ Chevron compliance are based on total trips (not only the Project's net new trips) and assumes the Project's refined gross floor area of 152,080 SF, as detailed in *Section 6.1*. Based on these assumptions, the Project would generate 1,217 total ADT with 195 total AM peak hour trips and 170 total PM peak hour trips, as shown on *Table 6-2*.

Therefore, the Project is calculated to generate 281 fewer ADT and 45 AM and 40 PM fewer AM/PM peak hour trips as compared to the CPIOZ Chevron maximum, as shown on *Table 6-2*. Therefore, the Project complies with the CPIOZ Chevron requirement, and mitigation of peak hour trips is not required.

TABLE 6–1
PROJECT TRIP GENERATION

Land Use	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
				% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
		Rate [a]	Volume			In	Out	Total			In	Out	Total
Proposed Uses													
Research and Development	203.096 KSF	8 /KSF	1,625	16%	90:10	234	26	260	14%	10:90	23	205	228
Existing Uses to be Removed													
Research and Development	76.694 KSF	8 /KSF	614	16%	90:10	88	10	98	14%	10:90	6	77	86
Net New Trips			**1,011**			**146**	**16**	**162**			**14**	**128**	**142**

Footnotes:
a. Trip rates from *Trip Generation Manual*, City of San Diego, May 2003.

General Notes:
1. KSF - 1,000 Square Feet.

TABLE 6–2
SUPPLEMENTARY PROJECT TRIP GENERATION FOR CPIOZ COMPLIANCE

Land Use	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
				% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
		Rate [a]	Volume			In	Out	Total			In	Out	Total
Proposed Uses													
Research and Development	152,080 KSF	8 /KSF	1,217	16%	90:10	176	19	195	14%	10:90	17	153	170
Allowable Trips per Chevron CPIOZ													
Research and Development	187,200[c] KSF	8 /KSF	1,498	16%	90:10	216	24	240	14%	10:90	21	189	210
Project Trips Exceeding the CPIOZ Requirement			**-281**			**-40**	**-5**	**-45**			**-4**	**-36**	**-40**

Footnotes:

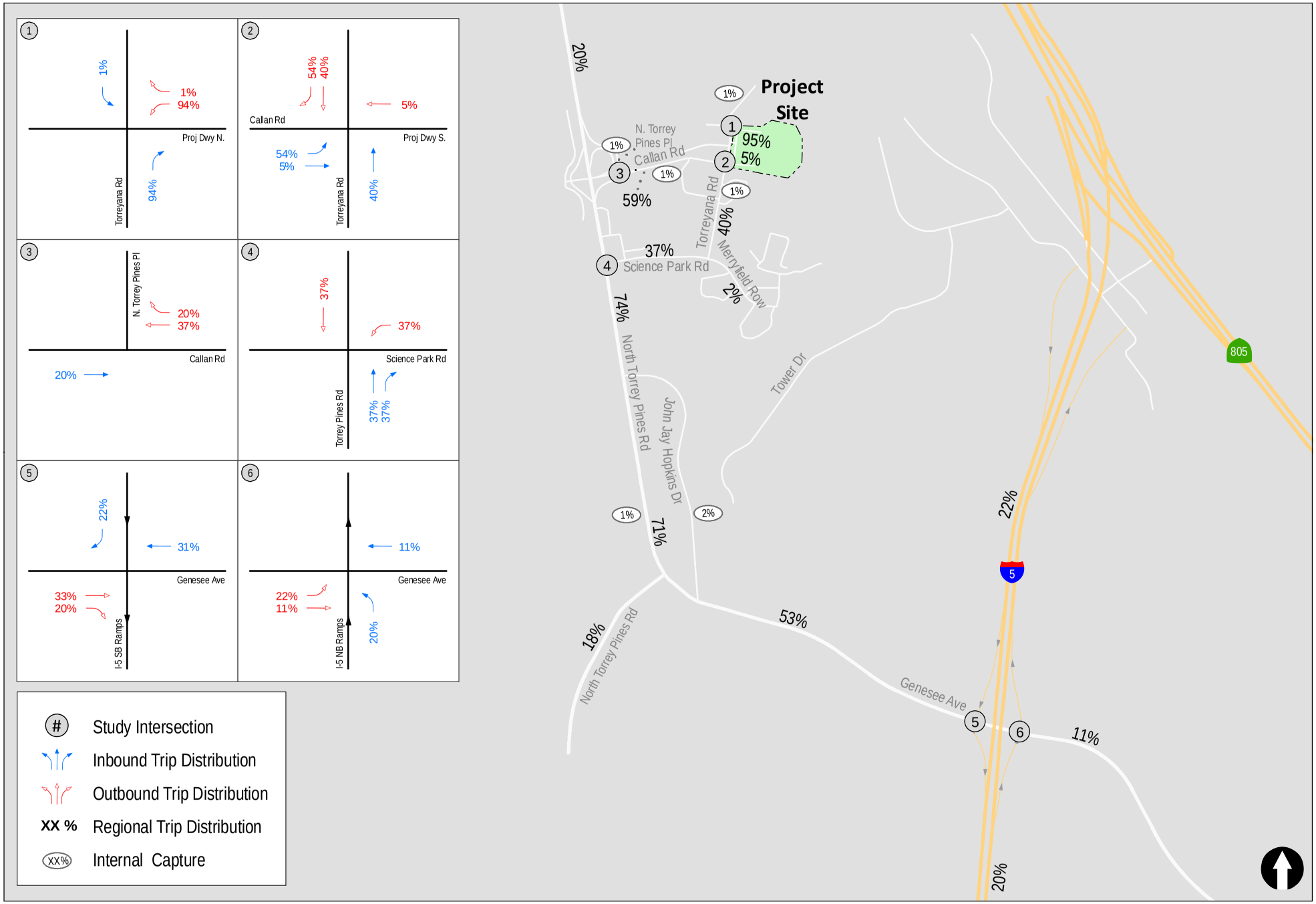
a. Trip rates from *Trip Generation Manual*, City of San Diego, May 2003.

b. Assumes the refined 152,080 SF of GFA.

c. A maximum of 187,200 SF (at 18,000 SF per acre) can be developed on the Project site's 10.4-acres per the site's CPIOZ Chevron zoning before mitigation is required.

General Notes:

1. KSF - 1,000 Square Feet.



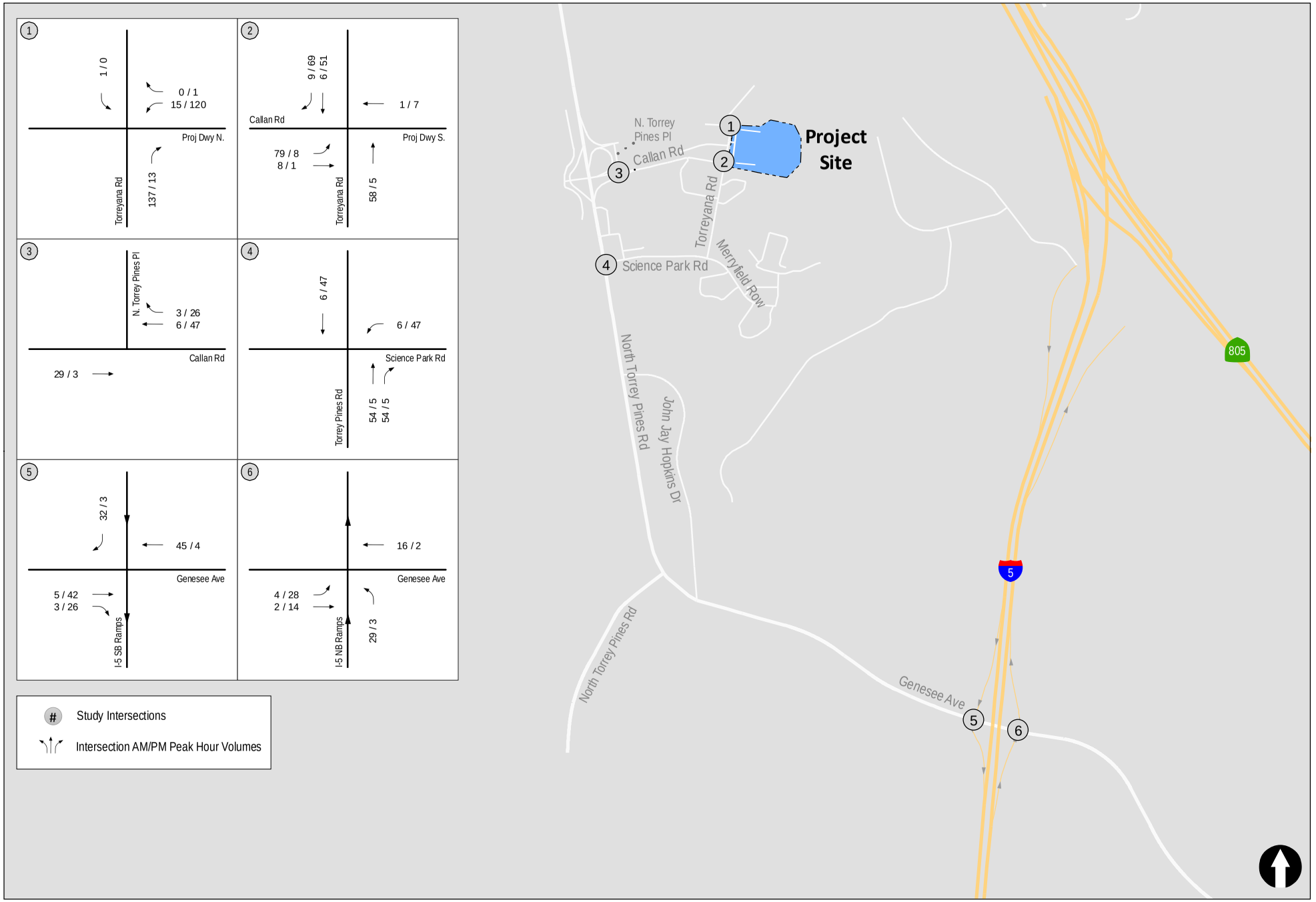
LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 10/9/2023
Time: 9:06 AM

Figure 6-1

Project Trip Distribtution

11011 Torreyana Project



N:\3527\Figures
Date: 4/10/2023
Time: 10:41 AM

Figure 6-2

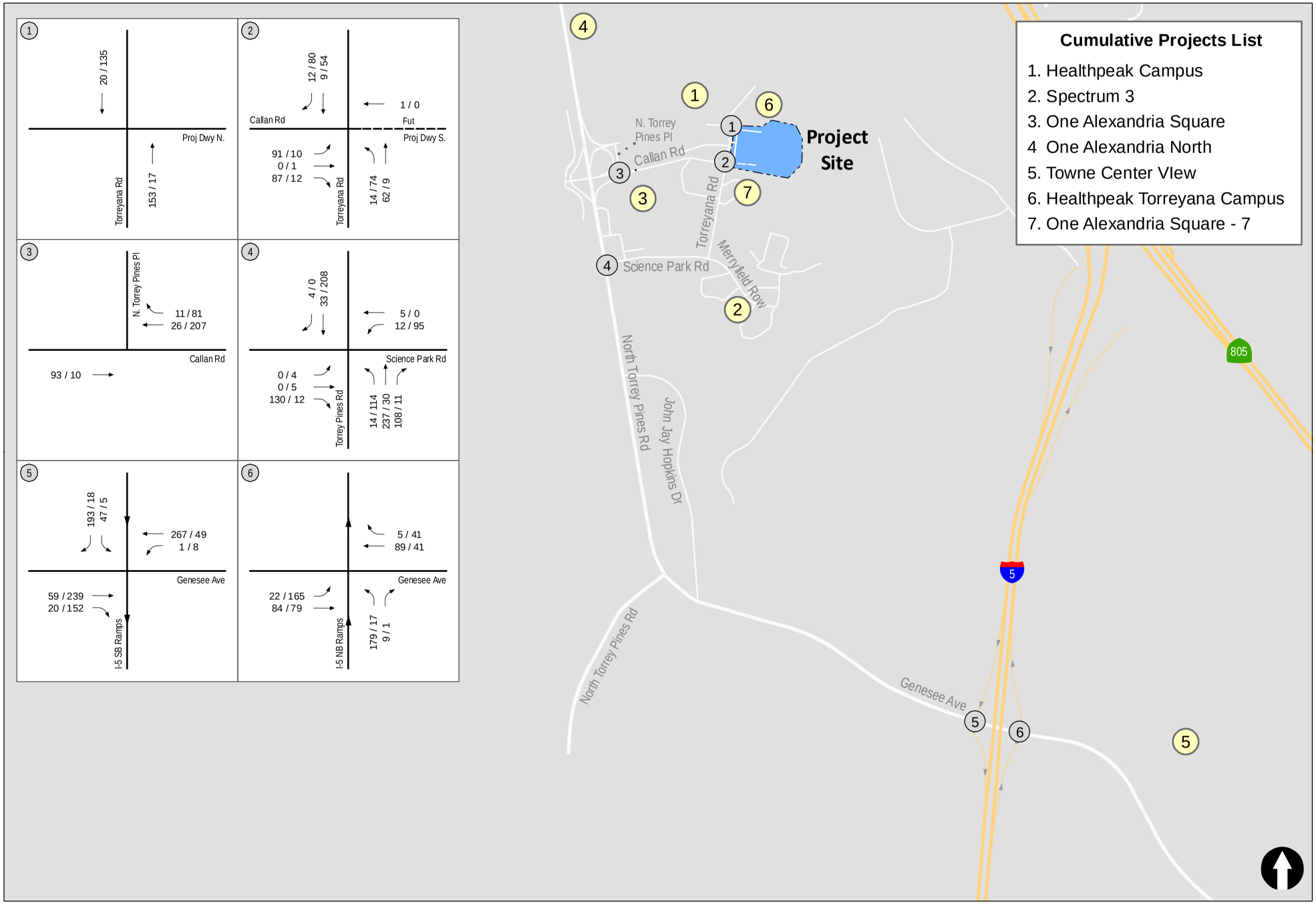
Project Traffic Volumes

11011 Torreyana Project

7.0 CUMULATIVE PROJECTS

"Cumulative" projects are other projects in the study area that are expected to be constructed and occupied by the Project's expected Opening Year in Year 2026, thus adding traffic to the local circulation system. LLG researched ongoing cumulative projects in the study area that could be constructed and generating traffic in the study area vicinity by the expected Opening Year of the Project in Year 2026. Based on this research, seven (7) cumulative projects are planned nearby that would add traffic to study area intersections. ***Table 7-1*** presents the information and estimated trip generation of the seven cumulative projects. ***Figure 7-1*** shows the cumulative projects traffic volumes and locations.

Appendix F includes the trip distribution and assignments for the cumulative projects summarized in *Table 7-1*.



LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 4/10/2023
Time: 10:35 AM

Figure 7-1

Cumulative Projects Traffic Volumes and Locations

11011 Torreyana Project

TABLE 7-1
CUMULATIVE PROJECTS TRIP GENERATION

Cumulative Projects		PTS#	Address	Land Use	Size	Status	Daily Trips	AM Peak Hour			PM Peak Hour		
								Total	IN	OUT	Total	IN	OUT
1	Healthpeak Campus CDP/SDP/PDP	658398	3020-3030 Callan Road	R&D	148.200 KSF	Approved	1,186	190	171	19	166	17	149
2	Spectrum III and IV Amendment PDP (Spectrum IV is completed)	566056	3115 Merryfield Row	R&D	118.931 KSF	Under Construction (Spectrum III)	951	152	137	15	133	13	120
3	One Alexandria Square	660043	10996 Torreyana Rd	R&D	114.803 KSF	Approved	942	151	136	15	132	13	119
4	One Alexandria North	691942	11255/11355 North Torrey Pines Road	R&D	256.500 KSF	Approved	715	115	12	127	8	78	86
5	Towne Centre View	624751	9845 Towne Centre Drive	R&D	1,000.00 KSF	Approved	6,461	1,034	931	103	905	90	815
6	Healthpeak Torreyana Campus	1056938	11085/11095 Torreyana Rd	R&D	134.000 KSF	Under Review	1,072	171	154	17	150	15	135
7	One Alexandria Square - 7	1057530	10975/10995 Torreyana Rd	R&D	120.205 KSF	Under Review	962	154	139	15	134	13	121
Total Cumulative Project Trips							**12,289**	**1,967**	**1,680**	**311**	**1,628**	**239**	**1,545**

Source: City of San Diego Development Services Department "OpenDSD" interactive map search tool. (URL: https://opendsd.sandiego.gov/Web/Maps/ApprovalsDiscretionary)

8.0 OPENING YEAR 2026 ANALYSIS

The following section presents the analysis of study area locations under Opening Year 2026 conditions.

8.1 Opening Year 2026 Auto Conditions and Traffic Volumes

For the purposes of this study, no roadway network changes were assumed in the Opening Year 2026. Similarly, no changes were assumed to the available pedestrian, bike, and transit facilities between Existing and Opening Year 2026 conditions.

The Opening Year 2026 without Project forecast volumes were calculated by adding the volumes generated by the seven (7) cumulative projects discussed in *Section 7.0* to the existing traffic volumes.

Figure 8–1 shows the Opening Year 2026 traffic volumes. ***Figure 8–2*** shows the Opening Year 2026 + Project traffic volumes.

8.1.1 *Peak Hour Intersection Operations*

Table 8–1 summarizes the peak hour intersection operations for the Opening Year 2026 Without Project condition. As seen in *Table 8–1*, the following intersections are calculated to operate at LOS F:

- #5: Genesee Avenue / I-5 SB Ramps (LOS F during the AM peak hour)
- #6: Genesee Avenue / I-5 NB Ramps (LOS F during the PM peak hour)

Appendix G contains the intersection analysis worksheets for the Opening Year 2026 scenario.

8.2 Opening Year 2026 + Project

For the purposes of this study, no changes to the roadway, pedestrian, bicycle, and transit networks were assumed in the Opening Year 2026 + Project analysis.

8.2.1 *Peak Hour Intersection Operations*

Table 8–1 summarizes the peak hour intersection operations for the Opening Year 2026 With Project condition. As seen in *Table 8–1*, with the addition of Project traffic, the following intersections are calculated to continue to operate at LOS F:

- #5: Genesee Avenue / I-5 SB Ramps (LOS F during the AM peak hour)
- #6: Genesee Avenue / I-5 NB Ramps (LOS F during the PM peak hour)

Appendix H contains the intersection analysis worksheets for the Opening Year 2026 + Project scenario.

8.2.2 *Intersection Turn Lane Evaluation*

The need for left-turn and right-turn lanes at the signalized study intersections were evaluated per the criteria identified in the *TSM* (2022). The turn lane evaluation was performed for the following signalized study area intersection:

4. Torrey Pines Road / Science Park Road

Per the City's TSM, a single left-turn lane, a second left-turn lane, a single right-turn lane or a second right-turn lane should be considered if a project adds traffic that causes the peak hour traffic volume to exceed the following:

- Single Left-Turn Lane: Over 100
- Second Left-Turn Lane: Over 300
- Single Right-Turn Lane: Over 500
- Second Right-Turn Lane: Over 800

Table 8–2 summarizes the results of the turn lane evaluation for the signalized study area intersection listed above. As shown in *Table 8–2*, the addition of Project traffic would not result in the need for an additional dedicated left-turn or right-turn lane at the signalized study area intersection.

8.2.3 *Queue Analysis*

A queuing analysis was performed during the peak hours under Opening Year 2026 conditions without and with the Project for the existing left-turn and right-turn lanes of the signalized study intersections to which Project trips are added. ***Table 8–3*** summarizes the peak hour queuing for the study intersection turning movements under Opening Year 2026 and Opening Year 2026 + Project conditions. As shown in *Table 8-3*, the queues at the following intersections are expected to exceed the storage capacity:

- #4: Torrey Pines Rd / Science Park Rd
  - Westbound left – PM peak hour (Opening Year 2026 and Opening Year 2026 + Project). The PM peak hour westbound left-turn queue is calculated to increase from 309' under without Project conditions to 328' under with Project conditions. The increase of 19' would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed.
  - Northbound right – AM peak hour (Opening Year 2026 and Opening Year 2026 + Project). The AM peak hour northbound right-turn queue is calculated to increase from 261' under without Project conditions to 286' under with Project conditions. The increase of 25' would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed.
- #5: Genesee Ave / I-5 SB Ramps
  - Southbound right – AM Peak hour (Opening Year 2026 and Opening Year 2026 + Project). The AM peak hour southbound right-turn queue is calculated to remain

at 1,184' under both the without and with Project scenarios. Therefore, improvements are not proposed.

- #6: Genesee Ave / I-5 NB Ramps
    - Northbound left – AM & PM Peak hour (Opening Year 2026 and Opening Year 2026 + Project). The northbound left-turn queue is calculated to increase from 1,101' under without Project conditions to 1,109' under with Project conditions during the AM peak hour and is calculated to increase from 1,002' under without Project conditions to 1,107' under with Project conditions during the PM peak hour. The increase of 5' during the AM peak hour and the increase of 105' during the PM peak hour would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed.

Appendix I contains the SIM Traffic queue analysis worksheets.

8.3 Active Transportation Considerations

8.3.1 *Pedestrian Improvements*

To promote pedestrian mobility, the Project proposes the following pedestrian enhancements:

- The Project will provide an on-site gym (available only to employees) which will reduce the need to drive. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

8.3.2 *Bicycle Improvements*

To promote bicycle mobility, the Project proposes the following bicycle features:

- The Project will provide an on-site bicycle repair station.
- The Project will provide a minimum of five (5) electric bicycle charging stations / micro mobility charging stations that are available to the public.
- The Project will provide short-term bicycle parking spaces available to the public, at least 10% beyond minimum requirements. The minimum required per the SDMC is zero (0) spaces and three (3) spaces will be provided.
- The Project will provide long-term bicycle parking spaces at least 10% beyond minimum requirements. The minimum required per the SDMC is twenty-one (21) spaces and twenty-four (24) spaces will be provided.
- The Project will provide three (3) on-site showers and 11 two-tier lockers.
- On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- Class II bike lanes are proposed along Science Park Road by the "One Alexandria Square" Project (PTS 660043) and along Torreyana Road by the "One Alexandria Square-7" Project (PTS 1057530).

- The Project will implement a parking cash out program for all employees to incentivize employees to bike to work. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

8.3.2.1 *Future Transit Improvements*

Per San Diego Forward: The 2021 Regional Plan, a variety of transportation improvements are planned along the South Bay to Sorrento Corridor. These improvements include implementing nearly 30 active transportation projects to build up the interconnected bikeway system, adding managed lanes to I-5 and I-805 to ease congestion and give priority access to Rapid transit vehicles, and connecting nearly the entire South Bay to Sorrento Corridor via commuter rail.

The Project will benefit from the improvements included in the San Diego Forward: The 2021 Regional Plan as it is located toward the northern terminus of the South Bay to Sorrento Corridor.

Appendix J includes excerpts from the San Diego Forward: The 2021 Regional Plan. The excerpts explain in detail the Transportation Projects, Programs, & Phasing, as well as the Cost Estimation Methodology, Funding and Revenue for the 2021 Regional Plan projects.

8.3.2.2 *Transit Improvement Recommendations*

The following transit-related features will be provided by the Project:

- The Project will provide an on-site multi-modal information kiosk in the lobby.
- The Project will implement a parking cash out program for all employees to incentivize employees to use public transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

TABLE 8–1
OPENING YEAR 2026 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Opening Year 2026		Opening Year 2026 + Project		Δ[c]
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	
1. Torreyana Road / Northern Project Driveway	MSSC[d]	AM	10.1	A	10.8	B	0.7
		PM	9.9	B	10.9	B	1.0
2. Torreyana Road / Callan Road / Southern Project Driveway	AWSC[e]	AM	10.0	A	12.6	A	2.6
		PM	8.6	A	9.7	A	1.1
3. N. Torrey Pines Place / Callan Road	MSSC[d]	AM	9.1	A	9.2	A	0.1
		PM	12.1	B	12.8	B	0.7
4. Torrey Pines Road / Science Park Road	Signal	AM	44.8	C	49.1	D	4.3
		PM	34.0	C	34.8	C	0.8
5. Genesee Avenue / I-5 Southbound Ramps	Signal	AM	95.0	E	101.9	F	6.9
		PM	22.1	B	22.4	C	0.3
6. Genesee Avenue / I-5 Northbound Ramps	Signal	AM	43.3	D	44.7	D	1.4
		PM	135.4	F	139.5	F	4.1

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the project-induced increase in delay.
d. Minor-Street Stop Control. Worst case movement delay is reported.
e. All-Way Stop Control. Average intersection delay is reported.

SIGNAL		UNSIGNAL	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 8–2
INTERSECTION TURN LANE EVALUATION

Intersection	Lane / Movement	# of Lanes	Opening Year 2026		Opening Year 2026 + Project		Left-Turn Volume Thresholds		Right-Turn Volume Thresholds	
			AM Peak Hour Volume	PM Peak Hour Volume	AM Peak Hour Volume	PM Peak Hour Volume	Single Left-Turn Lane	Second Left-Turn Lane	Single Right-Turn Lane	Second Right-Turn Lane
4. Torrey Pines Road / Science Park Road	EB Left	N/A[1]	9	22	9	22	100	300	500	800
	EB Right	1	179	79	179	79				
	WB Left	2	73	**590**	79	**637**				
	WB Right	1	14	125	14	125				
	NB Left	1	**134**	**186**	**134**	**186**				
	NB Right	1	**661**	100	**715**	105				
	SB Left	1	**159**	13	**159**	13				
	SB Right	1	38	13	38	13				

General Note:

1. Shared – either a shared left-turn/through lane, a shared through/right-turn lane or a shared left-turn/through/right-turn lane.

BOLD represents Peak Hour Volumes that exceed the Turn Volumes Thresholds.

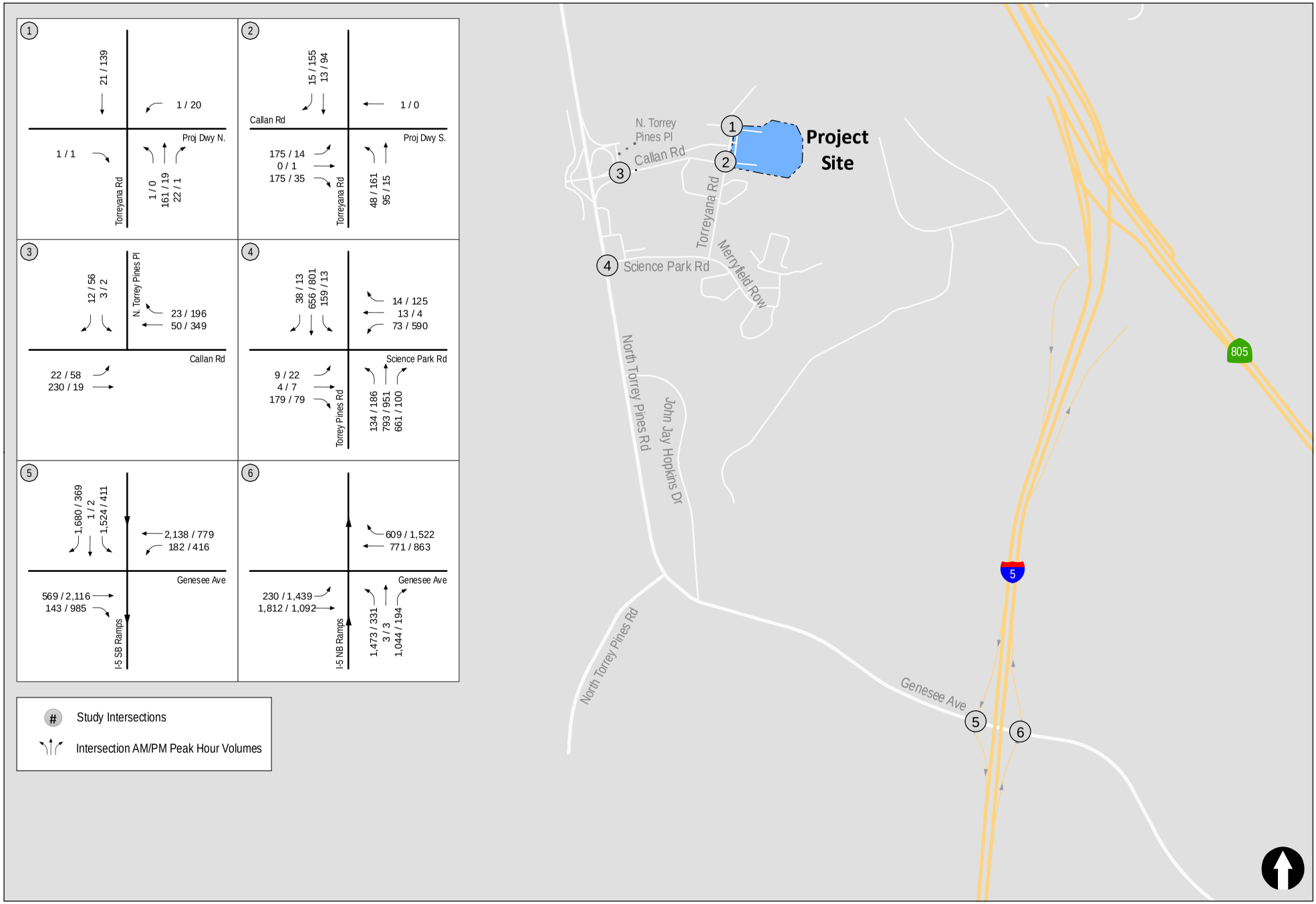
TABLE 8-3
OPENING YEAR 2026 INTERSECTION QUEUE ANALYSIS

Intersection	Movement	Peak Hour	Opening Year 2026		Opening Year 2026 + Project	
			Available Storage	Queue Length	Available Storage	Queue Length
4. Torrey Pines Rd / Science Park Rd	WBL	AM	300’	44’	300’	54’
		PM	300’	**309’**	300’	**328’**
	NBR	AM	230’	**261’**	230’	**286’**
		PM	230’	42’	230’	41’
5. Genesee Ave / I-5 SB Ramps	SBR	AM	805’	**1,184’**	805’	**1,184’**
		PM	805’	119’	805’	125’
	EBR	AM	440’	21’	440’	26’
		PM	440’	256’	440’	264’
6. Genesee Ave / I-5 NB Ramps	EBL	AM	400’	124’	400’	119’
		PM	400’	478’	400’	480’
	NBL	AM	845’	**1,101’**	845’	**1,109’**
		PM	845’	**1,002’**	845’	**1,107’**

General Notes:

95th percentile queues reported.

BOLD represents queues that exceed available storage.

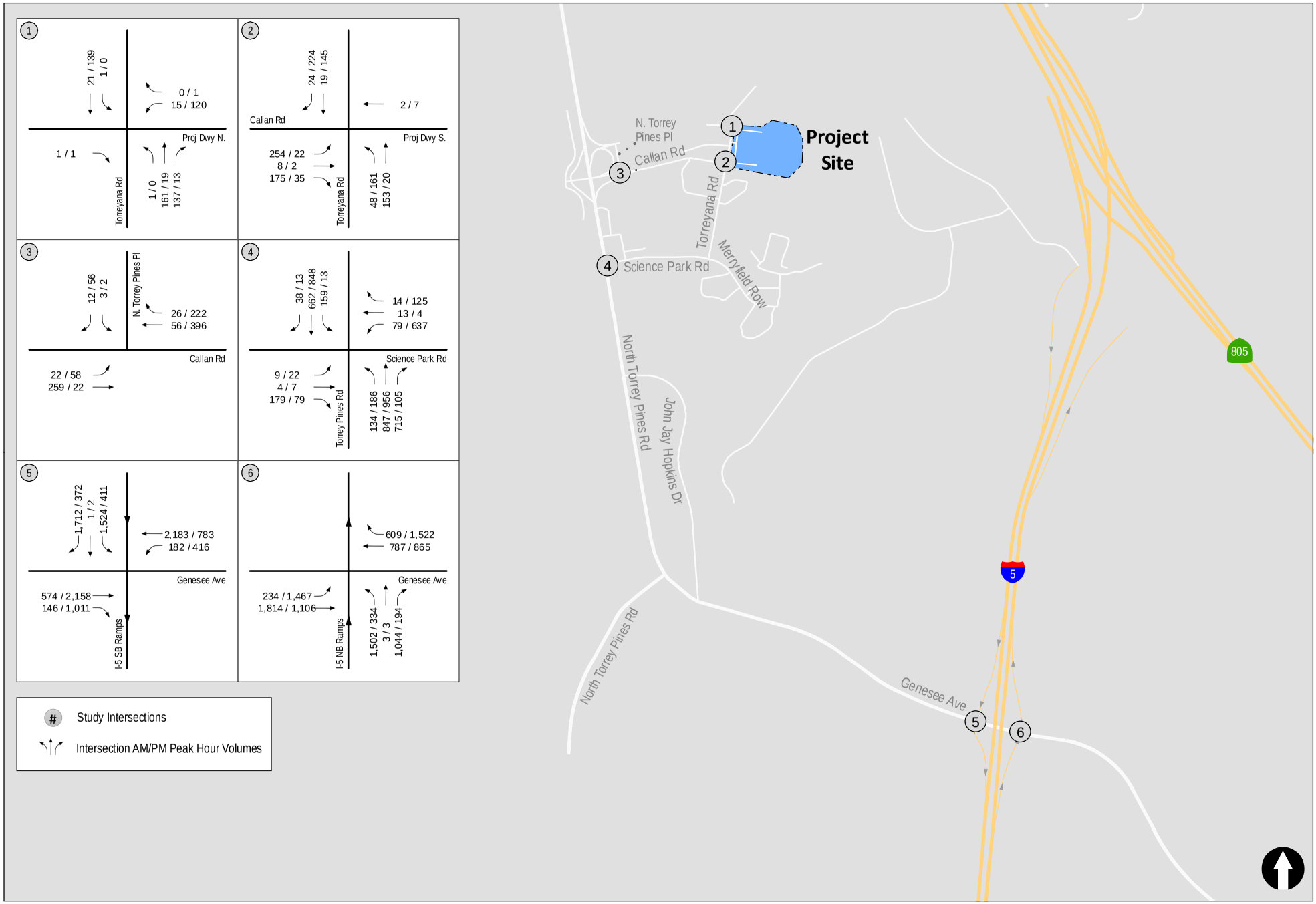


N:\3527\Figures
Date: 4/10/2023
Time: 2:35 PM

Figure 8-1

Opening Year 2026 Traffic Volumes

11011 Torreyana Project



N:\3527\Figures
Date: 4/10/2023
Time: 2:36 PM

Figure 8-2

Opening Year 2026 + Project Traffic Volumes

11011 Torreyana Project

9.0 SITE ACCESS, CIRCULATION AND PARKING

9.1 Driveway Access

Access to the site is proposed via two driveways off of Torreyana Road. The driveways will be built to City standards with appropriate widths, sight distance, spacing, permitting turn movements, and accommodation of delivery vehicles. The southern driveway is proposed opposite Callan Road, forming the fourth leg of the Torreyana Road / Callan Road intersection, and will be used solely for deliveries and fire access. The northern driveway, which currently serves the site, will remain and serve as the primary day-to-day access point. Both access points are calculated to operate acceptably at LOS B or better during the AM and PM peak hours, as shown in *Table 8-1*.

9.2 Parking

The number of parking spaces for automobile, bicycle, and motorcycle parking shall comply with the Land Development Code (LDC) regulations. Based on the City of San Diego's minimum parking rates, the Project is required to provide a minimum of 426 vehicular parking spaces. The project proposes to provide 484 parking spaces, exceeding the City of San Diego's minimum parking requirement.

The Project is required to provide the following:

- 426 total parking spaces
- 13 accessible parking spaces
- 44 clean air/low emitting parking spaces
- 98 EV charging parking spaces
- 9 motorcycle parking spaces
- 0 short-term bicycle parking spaces
- 21 long-term bicycle parking spaces

The Project proposes to provide the following:

- 484 total parking spaces
- 16 accessible parking spaces
- 44 clean air/low emitting parking spaces
- 98 EV charging parking spaces, 50 of which will be supplied with charging equipment.
- 9 motorcycle parking spaces
- 3 short-term bicycle parking spaces
- 24 long-term bicycle parking spaces

9.3 Loading Zones

The Project will provide a total of four (4) loading spaces.

10.0 SYSTEMIC SAFETY REVIEW

The City of San Diego's TSM requires that a Systemic Safety Review be conducted to determine if any of the study intersections meet the criteria to be identified as a Systemic Hotspot for pedestrians, bicycles, or vehicles. The City of San Diego's *Systemic Safety, The Data-Driven Path to Vision Zero Report* (April 2019), provides methodologies to identify pedestrian, bicycle, and vehicle hotspots based on specific intersection criteria.

10.1 Pedestrian Hot Spots

Based on an evaluation of the intersection footprints found in *Appendix C* of the *City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report (April 2019)* summarized in ***Table 10–1***, none of the study area intersections are identified as "hot spots" for pedestrians necessitating further evaluation.

10.2 Bicycle Hot Spots

Based on an evaluation of the intersection footprints found in *Appendix C* of the *City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report (April 2019)* summarized in *Table 10–1*, the following study area intersection is identified as a "hot spot" and meets Bicycle Footprint #2 necessitating further evaluation:

- #3: N. Torrey Pines Place / Callan Road

10.3 Vehicle Hot Spots

Based on an evaluation of the intersection footprints found in *Appendix C* of the *City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report (April 2019)* summarized in *Table 10–1*, none of the study area intersections are identified as "hot spots" for vehicles necessitating further evaluation.

10.4 Recommended Improvements

For intersections that meet the Bicycle Footprint #2 criteria, the City of San Diego's *Systemic Safety, The Data-Driven Path to Vision Zero* Report (April 2019), recommends non-engineering countermeasures that include educational countermeasures such as a public safety messaging campaign, and enforcement countermeasures such as bicycle stop sign running enforcement. However, the Project does not propose these improvements since these countermeasures are not feasible for a standalone Project.

TABLE 10–1
SYSTEMIC SAFETY REVIEW – HOTSPOT IDENTIFICATION

Intersection	Pedestrian Hotspot	Bicycle Hotspot	Vehicular Hotspot
1. Torreyana Road / Northern Project Dwy	-	-	-
2. Callan Road / Torreyana Road	-	-	-
3. N. Torrey Pines Place / Callan Road	-	**Yes (B-2)**	-
4. Torrey Pines Road / Science Park Road	-	-	-
5. Genesee Avenue / I-5 Southbound Ramps	-	-	-
6. Genesee Avenue / I-5 Northbound Ramps	-	-	-

General Notes:

1. Footprint criteria is based on the City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report, April 2019, Appendix C: Identification of Systemic Hotspots.
2. **Bold** and shaded = intersection meets hotspot criteria

11.0 CLIMATE ACTION PLAN COMPLIANCE: TRANSPORTATION DEMAND MANAGEMENT PROGRAM

To ensure compliance with the City of San Diego Climate Action Plan (CAP Checklist, Strategy 3, item 7) requirement to reduce Single Occupant Vehicle (SOV) travel and associated parking demand, the Project will implement the following Transportation Demand Management (TDM) measures:

- Parking Cash Out Program: The Project will implement a parking cash out for all employees to incentivize employees to carpool, vanpool, bike to work, or use public transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.
- The commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees.
- On-Site Bikesharing: On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- Access to Services that Reduce the Need to Drive: The Project will provide an on-site gym (available only to employees) which will reduce the need to drive. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

12.0 SUPPLEMENTAL ANALYSIS WITH SIGNAL CYCLE LENGTH ADJUSTMENTS

The intersections of Genesee Avenue and the I-5 northbound and southbound ramps are forecast to operate at LOS E or F under Opening Year 2026 conditions, both without and with Project traffic. Based on a review of the *One Alexandria Square Local Mobility Analysis*, January 7, 2022, which was prepared for a project (PTS #660043) in the immediate vicinity of the proposed Project site, the existing signal timing and 100-second cycle length at these two intersections is not long enough to adequately serve all movements during the peak hours. Based on coordination with City staff and Caltrans for the *One Alexandria Square* project, it was determined that an increase in cycle length to 110-seconds may reduce overall delay but would increase queue lengths at the southbound and northbound I-5 off-ramp movements. Therefore, improvements are not proposed at the two ramp intersections for the Genesee Avenue / I-5 interchange.

In order to confirm that an increase to the cycle lengths at the I-5 northbound and southbound ramps at Genesee Avenue to 110-seconds would reduce delays but increase queue lengths, a supplemental analysis was conducted.

Table 12-1 shows the intersection operations at the Genesee Avenue / I-5 Southbound Ramps and Genesee Avenue / I-5 Northbound Ramps intersections if signal cycle length adjustments were implemented during the peak hours under Opening Year 2026 + Project conditions. As shown, implementing a 110-second signal cycle length would improve the delays for both the AM and PM peak hours.

Table 12-2 shows the 95th percentile queue lengths at the Genesee Avenue / I-5 Southbound Ramps and Genesee Avenue / I-5 Northbound Ramps intersections if a 110-second cycle length was implemented during the peak hours under Opening Year 2026 + Project conditions. This analysis was conducted using the Sim Traffic software. As shown, queue lengths would increase for the off-ramps of both intersections during the AM and PM peak hours if a 110-second cycle length was implemented, with the exception of the southbound off-ramp during the AM peak hour, thereby increasing the chance of backups onto the freeway mainlines.

Appendix K shows the intersection and queue analysis Synchro 11 and Sim Traffic worksheets.

TABLE 12–1
OPENING YEAR 2026 INTERSECTION OPERATIONS (WITH INCREASED SIGNAL CYCLE LENGTH)

Intersection	Control Type	Peak Hour	Opening Year 2026 + Project		Opening Year 2026 + Project (With Increased Cycle Length)	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]
5. Genesee Avenue / I-5 Southbound Ramps	Signal	AM	**95.0**	**F**	**85.8**	**F**
		PM	22.1	C	23.5	C
6. Genesee Avenue / I-5 Northbound Ramps	Signal	AM	43.3	D	33.4	C
		PM	**135.4**	**F**	**131.0**	**F**

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

Bold and Shaded represent where failing delays are improved.

SIGNAL

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

TABLE 12-2
OPENING YEAR 2026 SIM TRAFFIC QUEUE ANALYSIS (WITH INCREASED SIGNAL CYCLE LENGTH)

Intersection	Movement	Turn Lanes	Storage per lane (ft)	Peak Hour	Volume	Opening Year 2026 + Project	Opening Year 2026 + Project (With Adjustments)
						Queue Length per lane (ft)[a]	Queue Length per lane (ft)[a]
5. Genesee Ave / I-5 SB Ramps	SBL	2	805	AM	1,524	947	973
				PM	411	**245**	820
	SBR	2	805	AM	1,712	**1,147**	**1,079**
				PM	372	125	**1,086**
	SB Off-Ramp	4	805	AM		**1,147**	**1,079**
				PM		**245**	**1,086**
	EBR	2	440	AM	146	26	23
				PM	1,011	264	332
	WBL	2	400	AM	182	96	102
				PM	416	198	215
6. Genesee Ave / I-5 NB Ramps	NBL	2	840[b]	AM	1,502	1,109	1,096
				PM	334	1,107	1,085
	NBR	2	750[b]	AM	1,044	**1,334**	**1,339**
				PM	194	**1,229**	**1,361**
	NB Off-Ramp	4	750[b]	AM		**1,334**	**1,339**
				PM		**1,229**	**1,361**
	EBL	2	400	AM	234	119	117
				PM	1,467	480	469
	WBR	2	400	AM	609	161	171
				PM	1,522	437	433

Footnotes:

a. Worst queue length per lane per movement reported.

b. Minimum storage length provided per lane.

General Notes:

95th percentile queues reported.

Bold represents the worst queue of each peak hour for the Off-Ramp movements.

Shaded row summarizes the results for the Off-Ramps.

13.0 PROJECT EFFECTS AND RECOMMENDATIONS

The preceding LMA evaluated potential operational deficiencies and transportation improvements that may need to be considered in association with the traffic generated by the proposed Project.

13.1 Intersection Operations Analysis Findings

The intersections of Genesee Avenue and the I-5 northbound and southbound ramps are forecast to operate at LOS E or F under Opening Year 2026 conditions, both without and with Project traffic. Based on a review of the *One Alexandria Square Local Mobility Analysis*, January 7, 2022, which was prepared for a project (PTS #660043) in the immediate vicinity of the proposed Project site, the existing signal timing and cycle length at these two intersections is not long enough to adequately serve all movements during the peak hours. Based on coordination with City staff and Caltrans for the *One Alexandria Square* project, it was determined that an increase in cycle length may reduce delays but would increase queue lengths at the southbound and northbound I-5 off-ramp movements. This was confirmed in a supplemental analysis included in Chapter 12.0 of this LMA. As seen in Chapter 12.0, the supplemental analysis showed the intersections of Genesee Avenue and the I-5 northbound and southbound ramps are forecast to operate at LOS F under Opening Year 2026 with Project traffic (with the increased signal cycle length). Therefore, improvements are not proposed at the two ramp intersections for the Genesee Avenue / I-5 interchange.

The remaining analysis intersections were calculated to operate acceptably at LOS D or better with the addition of Project tips, and therefore no off-site improvements are proposed.

13.2 Turn Lane Evaluation Findings

The need for left-turn or right-turn lanes at the signalized study intersections was also evaluated per the criteria identified in the City of San Diego's Transportation Study Manual. The results of the turn lane evaluation showed that the addition of Project traffic would not result in the need for a dedicated or second left-turn lane or a dedicated or second right-turn lane on the approaches of the signalized study intersections where these lanes are currently not provided.

13.3 Queuing Analysis Findings

The queuing analysis results also showed that the 95th percentile queue length is expected to exceed the storage length at the following locations for both the Opening Year 2026 and Opening Year 2026 + Project scenarios.

- 4: Torrey Pines Rd / Science Park Rd
  - Westbound left – PM peak hour (Opening Year 2026 and Opening Year 2026 + Project). The PM peak hour westbound left-turn queue is calculated to increase from 309' under without Project conditions to 328' under with Project conditions. The increase of 19' would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed.
  - Northbound right – AM peak hour (Opening Year 2026 and Opening Year 2026 + Project). The AM peak hour northbound right-turn queue is calculated to increase

from 261' under without Project conditions to 286' under with Project conditions. The increase of 25' would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed.

- #5: Genesee Ave / I-5 SB Ramps
  - Southbound right – AM Peak hour (Opening Year 2026 and Opening Year 2026 + Project). The AM peak hour southbound right-turn queue is calculated to remain at 1,184' under both the without and with Project scenarios. Therefore, improvements are not proposed. LLG's supplemental analysis provided in Chapter 12.0 showed that queue lengths would increase for the off-ramp during the AM peak hour if a 110-second cycle length was implemented.
- #6: Genesee Ave / I-5 NB Ramps
  - Northbound left – AM & PM Peak hour (Opening Year 2026 and Opening Year 2026 + Project). The northbound left-turn queue is calculated to increase from 1,101' under without Project conditions to 1,109' under with Project conditions during the AM peak hour and is calculated to increase from 1,002' under without Project conditions to 1,107' under with Project conditions during the PM peak hour. The increase of 5' during the AM peak hour and the increase of 105' during the PM peak hour would not alter traffic operations in a meaningful way. Therefore, improvements are not proposed. LLG's supplemental analysis provided in Chapter 12.0 showed that queue lengths would increase for the off-ramp during the AM and PM peak hours if a 110-second cycle length was implemented.

13.4 Systemic Safety Review Findings

A review of the City of San Diego's System Safety Hotspot map was conducted. Based on a review of the map the following study area intersections are identified as "hot spots" and meets Bicycle Footprint #2 necessitating further evaluation:

- #3: N. Torrey Pines Place / Callan Road

For intersections that meet the Bicycle Footprint #2 criteria, the City of San Diego's Systemic Safety, The Data-Driven Path to Vision Zero Report (April 2019), recommends non-engineering countermeasures that include educational countermeasures such as a public safety messaging campaign, and enforcement countermeasures such as bicycle stop sign running enforcement. However, the Project does not propose these improvements since these countermeasures are not feasible for a standalone Project.

13.5 Climate Action Plan Compliance: Transportation Demand Management Program

To ensure compliance with the City of San Diego CAP Checklist, Strategy 3, item 7 requirement to reduce SOV travel and associated parking demand, the Project will implement the following TDM measures:

- Parking Cash Out Program: The Project will implement a parking cash out program for all employees to incentivize employees to carpool, vanpool, bike to work, or use public

transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

- The commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees.
- On-Site Bikesharing: On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- Access to Services that Reduce the Need to Drive: The Project will provide an on-site gym (available only to employees) which will reduce the need to drive. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

13.6 Pedestrian Network Evaluation Findings

Evaluation of the pedestrian network in the study area revealed crosswalks are provided at the signalized study intersections and at the all-way stop controlled intersection of Callan Road / Torreyana Road. Evaluation of the pedestrian network also found that sidewalks are missing along the south side of Genesee Avenue between Jay Hopkins Drive and the I-5 SB Ramps.

Figure 4–3 shows the existing pedestrian network within the immediate vicinity of the Project as well as the missing sidewalks.

To promote pedestrian mobility, the Project proposes the following pedestrian enhancements:

- The Project will provide an on-site gym (available only to employees) which will reduce the need to drive. Additionally, multiple café/restaurants and a barber shop are located within a quarter-mile walking distance from the Project site and encourage walking trips.

13.7 Bicycle Network Evaluation Findings

The findings of the bicycle network evaluation showed that there are currently Class II bike lanes provided along North Torrey Pines Road and along John Jay Hopkins Drive in both directions of travel through the study area. The Class II bike lanes along North Torrey Pines Road include enhancements such as buffers along high-visibility green paint in the conflict zones. There are currently no bicycle facilities provided along Science Park Road, Torreyana Road, or Callan Road.

To promote bicycle mobility, and satisfy the Complete Communities: Mobility Choices regulations and Climate Action Plan Consistency Checklist requirements, the Project proposes the following bicycle features:

- The Project will provide an on-site bicycle repair station.
- The Project will provide a minimum of five (5) electric bicycle charging stations / micro mobility charging stations that are available to the public.
- The Project will provide short-term bicycle parking spaces available to the public, at least 10% beyond minimum requirements. The minimum required per the SDMC is zero (0) spaces and three (3) spaces will be provided.

- The Project will provide long-term bicycle parking spaces at least 10% beyond minimum requirements. The minimum required per the SDMC is twenty-one (21) spaces and twenty-four (24) spaces will be provided.
- The Project will provide three (3) on-site showers and 11 two-tier lockers.
- On-site bike sharing will be provided and will be located directly adjacent to the main entry of the building.
- The Project will implement a parking cash out program for all employees to incentivize employees to bike to work. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

13.8 Transit Network Evaluation Findings

Evaluation of the transit network in the study are revealed that there are currently two (2) transit bus stops provided along North Torrey Pines Road within ½ mile walking distance of the project site for NCTD Route 101. There are four (4) transit bus stops provided for MTS Route 978 along Science Park Road, Torreyana Road, and Callan Road within ½ mile walking distance of the project site. Amenities such as shelters, bench and trash receptable are provided at one (1) of the six (6) transit stops within walking distance of the project site.

The following transit-related features will be provided by the Project to satisfy the Climate Action Plan Consistency Checklist requirements:

- The Project will provide an on-site multi-modal information kiosk in the lobby.
- The Project will implement a parking cash out program for all employees to incentivize employees to use public transit. The parking cash out program will include discounts or subsidies to be used at on-site amenities at least $30 per month.

TECHNICAL APPENDICES

11011 TORREYANA PROJECT

City of San Diego, California
April 2024

LLG Ref. 3-22-3527

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

APPENDIX A

INTERSECTION ANALYSIS METHODOLOGY

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. **Table 1** summarizes the delay thresholds for signalized intersections.

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

TABLE 1

LEVEL OF SERVICE THRESHOLDS FOR SIGNALIZED INTERSECTIONS

AVERAGE CONTROL DELAY PER VEHICLE (SECONDS/VEHICLE)			LEVEL OF SERVICE
0.0	≤	10.0	A
10.1	to	20.0	B
21.1	to	35.0	C
35.1	to	55.0	D
55.1	to	80.0	E
	≥	80.0	F

Source: Highway Capacity Manual, 2000.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are more frequent.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

UNSIGNALIZED INTERSECTIONS

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. **Table 2** depicts the criteria, which are based on the average control delay for any particular minor movement.

TABLE 2

LEVEL OF SERVICE THRESHOLDS FOR UNSIGNALIZED INTERSECTIONS

AVERAGE CONTROL DELAY PER VEHICLE (SECONDS/VEHICLE)	LEVEL OF SERVICE	EXPECTED DELAY TO MINOR STREET TRAFFIC
0.0 ≤ 10.0	A	Little or no delay
10.1 to 15.0	B	Short traffic delays
15.1 to 25.0	C	Average traffic delays
25.1 to 35.0	D	Long traffic delays
35.1 to 50.0	E	Very long traffic delays
≥ 50.0	F	Severe congestion

Source: Highway Capacity Manual, 2000.

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

APPENDIX B

INTERSECTION MANUAL COUNT SHEETS

Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#01	File Name:	ITM-23-024-01
Intersection:	Torreyana Road & Driveways	Project:	LLG Ref. 3-22-3527
Date of Count:	Tuesday February 28, 2023		Torreyana Road, S.D.

AM	North Driveway Southbound			East Driveway Westbound			Torreyana Road Northbound			West Driveway Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	0	0	0	1	0	0	0	1	2	0	0	0	4
7:15	0	0	0	0	0	0	0	1	2	0	0	0	3
7:30	0	0	0	1	0	0	0	3	2	0	0	0	6
7:45	0	0	0	0	0	0	0	0	3	0	0	2	5
8:00	0	0	0	0	0	0	0	1	5	0	0	0	6
8:15	0	0	0	0	0	0	0	1	4	0	0	0	5
8:30	0	0	0	1	0	0	0	3	9	0	0	1	14
8:45	0	1	0	0	0	0	1	3	4	0	0	0	9
Total	0	1	0	3	0	0	1	13	31	0	0	3	52
Approach%	-	100.0	-	100.0	-	-	2.2	28.9	68.9	-	-	100.0	
Total%	-	1.9	-	5.8	-	-	1.9	25.0	59.6	-	-	5.8	

AM Intersection Peak Hour: **08:00 to 09:00**

Volume	-	1	-	1	-	-	1	8	22	-	-	1	34
Approach%	-	100.0	-	100.0	-	-	3.2	25.8	71.0	-	-	100.0	
Total%	-	2.9	-	2.9	-	-	2.9	23.5	64.7	-	-	2.9	
PHF			0.25			0.25			0.65			0.25	0.61

PM	North Driveway Southbound			East Driveway Westbound			Torreyana Road Northbound			West Driveway Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	0	3	0	7	0	0	0	0	0	0	0	0	10
16:15	0	4	0	2	0	0	0	0	0	0	0	0	6
16:30	0	0	0	2	0	0	0	0	0	0	0	0	2
16:45	0	2	0	6	0	0	0	0	0	0	0	0	8
17:00	0	0	0	4	0	0	0	0	0	0	0	0	4
17:15	0	0	0	3	0	0	0	1	0	0	0	1	5
17:30	0	2	0	7	0	0	0	1	1	0	0	0	11
17:45	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	11	0	32	0	0	0	2	1	0	0	1	47
Approach%	-	100.0	-	100.0	-	-	-	66.7	33.3	-	-	100.0	
Total%	-	23.4	-	68.1	-	-	-	4.3	2.1	-	-	2.1	

PM Intersection Peak Hour: **16:45 to 17:45**

Volume	-	4	-	20	-	-	-	2	1	-	-	1	28
Approach%	-	100.0	-	100.0	-	-	-	66.7	33.3	-	-	100.0	
Total%	-	14.3	-	71.4	-	-	-	7.1	3.6	-	-	3.6	
PHF			0.50			0.71			0.38			0.25	0.64

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

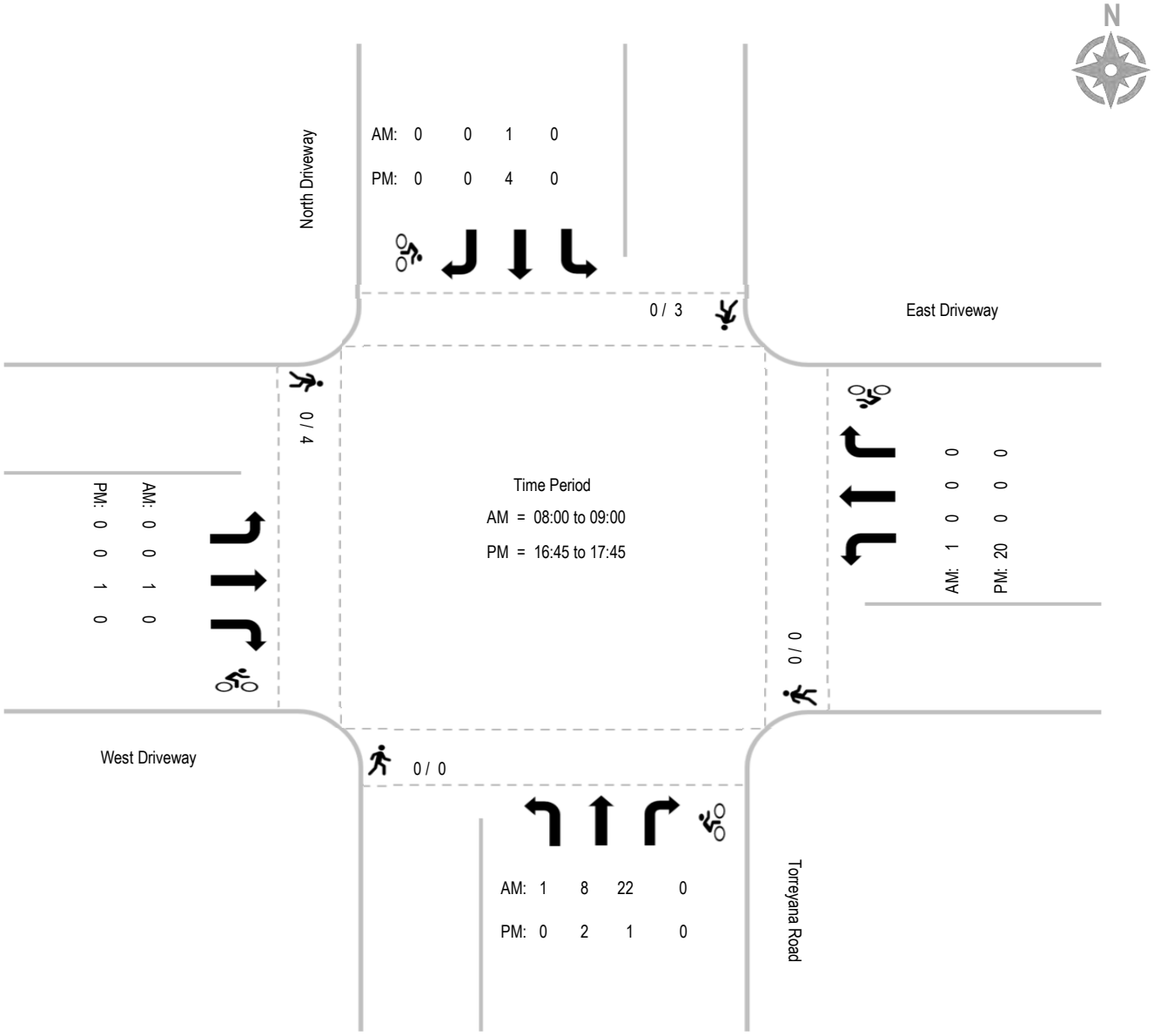
Location:	#01	File Name:	ITM-23-024-01
Intersection:	Torreyana Road & Driveways	Project:	LLG Ref. 3-22-3527
Date of Count:	Tuesday February 28, 2023		Torreyana Road, S.D.

AM	North Driveway Southbound				East Driveway Westbound				Torreyana Road Northbound				West Driveway Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	North Driveway Southbound				East Driveway Westbound				Torreyana Road Northbound				West Driveway Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0
16:15	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	3				0				0				4				7	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary

LINSCOTT LAW & GREENSPAN engineers	Location:	#01	File Name: ITM-23-024-01
	Intersection:	Torreyana Road & Driveways	Project: LLG Ref. 3-22-3527
	Date of Count:	Tuesday February 28, 2023	Torreyana Road, S.D.



Prepared by National Data & Surveying Services

Torreyana Rd & Callan Rd

Peak Hour Turning Movement Count

ID: 19-04420-001
City: San Diego

Day: Tuesday
Date: 10/29/2019

PEAK HOURS

AM: 08:00 AM - 09:00 AM
NOON: NONE
PM: 04:15 PM - 05:15 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

SOUTHBOUND — Torreyana Rd

AM	3	4	0	0	111	AM
NOON	0	0	0	0	0	NOON
PM	71	38	0	0	10	PM

EASTBOUND — Callan Rd

AM	NOON	PM	
35	0	154	⇦
0	0	0	↶ 0
80	0	4	↱ 0
0	0	0	→ 1
84	0	22	↴ 0

WESTBOUND — Callan Rd

PM	NOON	AM	
0	0	0	↰ 0
0	0	0	← 0
0	0	0	↱ 0
0	0	0	↳ 0
0	0	0	⇨

NORTHBOUND — Torreyana Rd

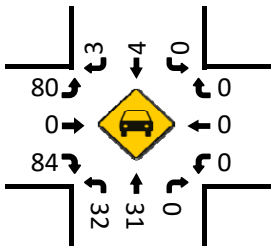
PM	60	0	83	6	0	PM
NOON	0	0	0	0	0	NOON
AM	88	0	32	31	0	AM

CONTROL

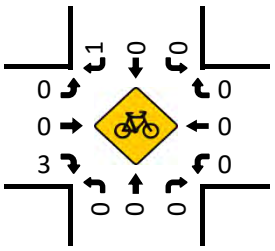
3-Way Stop(NB/SB/EB)

TEV	234 AM	0 NOON	224 PM
PHF	0.86		0.82

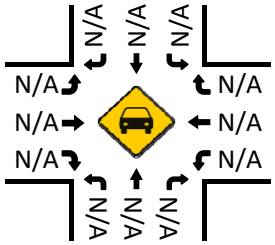
Total Vehicles (AM)



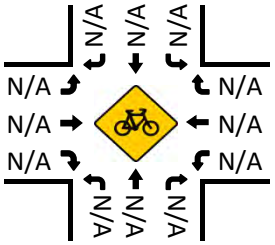
Bikes (AM)



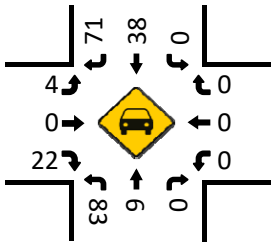
Total Vehicles (Noon)



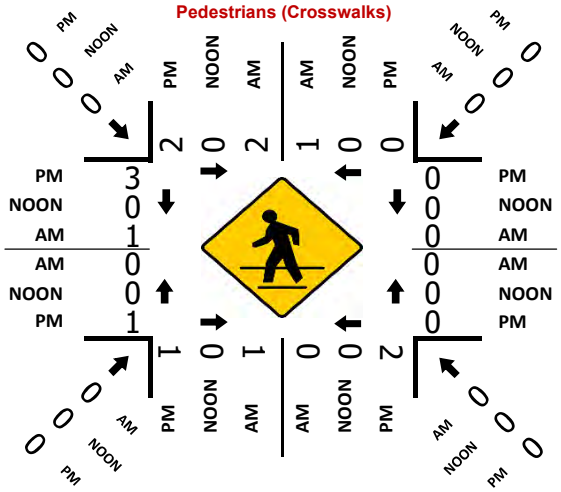
Bikes (NOON)



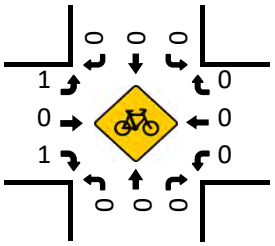
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

N Torrey Pines Rd NB & Callan Rd

Peak Hour Turning Movement Count

ID: 19-04447-002
City: La Jolla

Day: Wednesday
Date: 11/13/2019

PEAK HOURS	
AM	08:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 05:00 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

N Torrey Pines Rd NB — SOUTHBOUND

	↲	↓	↳	U	⇧
AM	11	0	3	0	35
NOON	0	0	0	0	0
PM	53	0	2	0	164
Lanes	1	1	0	0	

Callan Rd — EASTBOUND

	AM	NOON	PM	Lanes
⇦	34	0	188	
U	0	0	0	0
↱	21	0	55	0
→	130	0	9	1
↴	0	0	0	0

Callan Rd — WESTBOUND

	PM	NOON	AM	Lanes
↰	109	0	11	0
←	135	0	23	1
↵	0	0	0	0
U	0	0	0	0
⇨	45	0	254	

N Torrey Pines Rd NB — NORTHBOUND

	⇩	U	↰	↑	↱
Lanes		0	0	0	1
PM	0	0	0	0	34
NOON	0	0	0	0	0
AM	0	0	0	3	121

CONTROL

1-Way Stop(SB)

	AM	NOON	PM
TEV	323	0	397
PHF	0.95		0.89

Total Vehicles (AM)

Approach	Right	Through	Left
SB	11	0	3
EB	0	130	21
WB	11	23	0
NB	121	3	0

Total Vehicles (Noon)

Approach	Right	Through	Left
SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Right	Through	Left
SB	53	0	2
EB	0	9	55
WB	109	135	0
NB	34	0	0

Bikes (AM)

Approach	Right	Through	Left
SB	0	0	0
EB	0	2	0
WB	0	1	0
NB	0	0	0

Bikes (NOON)

Approach	Right	Through	Left
SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

Bikes (PM)

Approach	Right	Through	Left
SB	0	0	0
EB	0	0	1
WB	0	0	0
NB	1	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound (→)	0	0	1
North	Westbound (←)	0	0	3
West	Southbound (↓)	0	0	0
West	Northbound (↑)	0	0	0
East	Southbound (↓)	0	0	0
East	Northbound (↑)	0	0	0
South	Eastbound (→)	0	0	0
South	Westbound (←)	0	0	0
NW corner (diagonal)		0	0	0
NE corner (diagonal)		0	0	0
SW corner (diagonal)		0	0	0
SE corner (diagonal)		0	0	0

Prepared by National Data & Surveying Services

Torrey Pines Rd & Science Park Rd

Peak Hour Turning Movement Count

ID: 19-04420-003
City: San Diego

Day: Tuesday
Date: 10/29/2019

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

SOUTHBOUND — Torrey Pines Rd

AM	32	593	132	19	570	AM
NOON	0	0	0	0	0	NOON
PM	12	564	8	4	1017	PM

EASTBOUND — Science Park Rd

AM	NOON	PM	
94	0	70	
0	0	0	0
9	0	17	0.5
4	0	2	0.5
47	0	64	1

WESTBOUND — Science Park Rd

PM	NOON	AM	
119	0	13	1
4	0	8	0.5
417	0	58	1.5
0	0	0	0
95	0	662	

NORTHBOUND — Torrey Pines Rd

PM	1060	15	54	877	85	PM
NOON	0	0	0	0	0	NOON
AM	758	60	54	529	526	AM

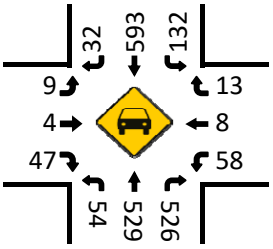
	1	3	1	0
	0	1	3	1

CONTROL

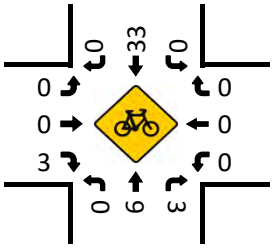
Signalized

TEV	2084 AM	0 NOON	2242 PM
PHF	0.89		0.95

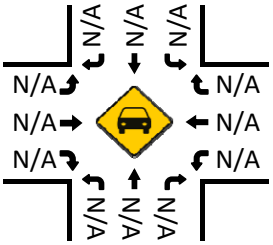
Total Vehicles (AM)



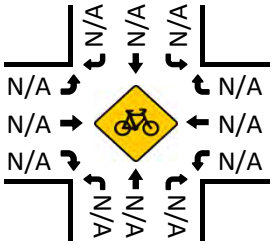
Bikes (AM)



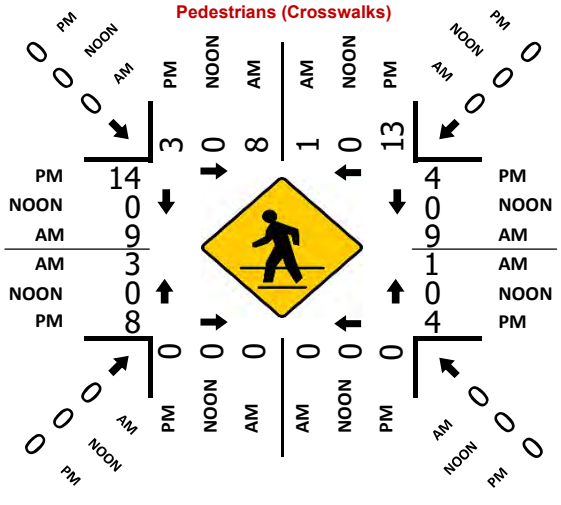
Total Vehicles (Noon)



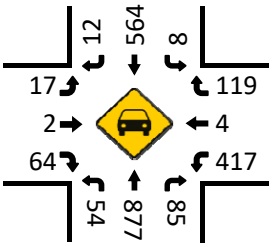
Bikes (NOON)



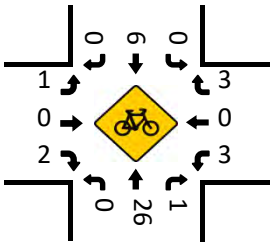
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

I-5 SB Ramps & Genesee Ave

Peak Hour Turning Movement Count

ID: 19-04420-009
City: San Diego

Day: Tuesday
Date: 10/29/2019

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

I-5 SB Ramps — SOUTHBOUND

AM	1415	1	1406	0	0	AM
NOON	0	0	0	0	0	NOON
PM	334	2	386	0	0	PM
	2	0.5	1.5	0		

Genesee Ave — EASTBOUND

AM	NOON	PM	
3196	0	1029	
0	0	0	0
0	0	0	0
485	0	1787	5
177	0	793	2
AM	NOON	PM	

CONTROL

Signalized

TEV	5437	0	4385
	AM	NOON	PM
PHF	0.91		0.94

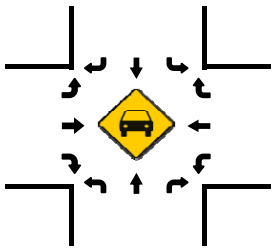
WESTBOUND — Genesee Ave

PM	NOON	AM	
0	0	0	0
695	0	1781	3
386	0	171	2
2	0	1	0
2175	0	1892	
PM	NOON	AM	

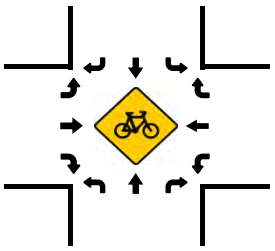
	0	0	0	0		
PM	1181	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	349	0	0	0	0	AM

NORTHBOUND — I-5 SB Ramps

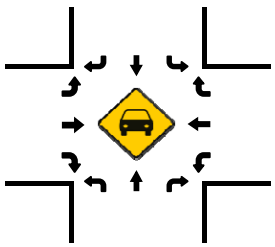
Total Vehicles (AM)



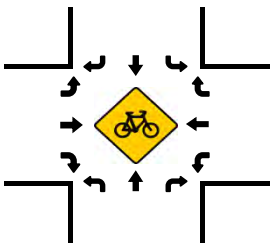
Bikes (AM)



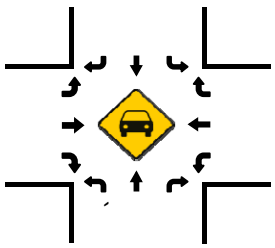
Total Vehicles (Noon)



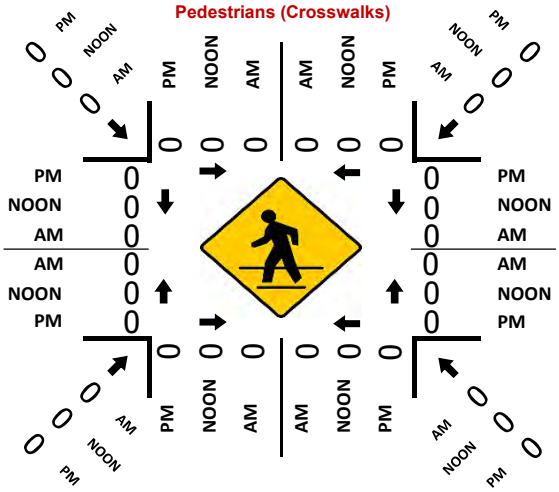
Bikes (NOON)



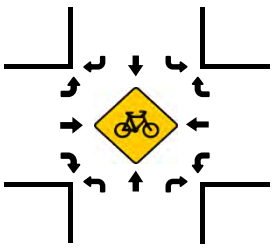
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

I-5 NB Ramps & Genesee Ave

Peak Hour Turning Movement Count

ID: 19-04420-010
City: San Diego

Day: Tuesday
Date: 10/29/2019

PEAK HOURS

AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

I-5 NB Ramps — SOUTHBOUND

AM	0	0	0	0	776	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	2625	PM

Genesee Ave — EASTBOUND

AM	NOON	PM		
1881	0	1082	⇦	
0	0	1	↶	0
198	0	1212	↱	2
1645	0	964	→	3
0	0	0	↷	0
AM	NOON	PM		

CONTROL

Signalized

TEV	5287	0	4855
	AM	NOON	PM
PHF	0.92		0.94

WESTBOUND — Genesee Ave

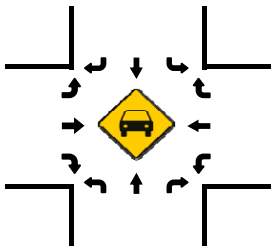
	PM	NOON	AM	
2	1410	0	575	↰
5	782	0	649	←
0	0	0	0	↰
0	0	0	0	↶
⇨	1148	0	2630	
	PM	NOON	AM	

I-5 NB Ramps — NORTHBOUND

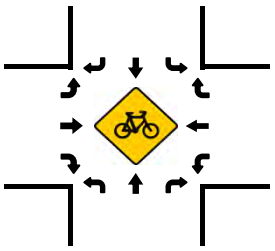
PM	0	0	299	3	184	PM
NOON	0	0	0	0	0	NOON
AM	0	0	1232	3	985	AM

0 0 0 0 | 2 5 0 0 | 0 1.5 0 1.5

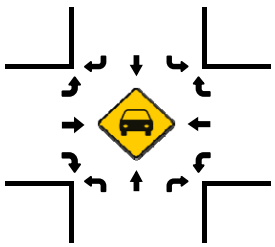
Total Vehicles (AM)



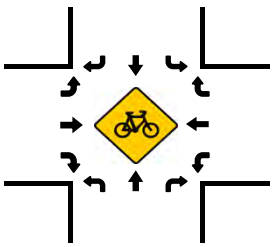
Bikes (AM)



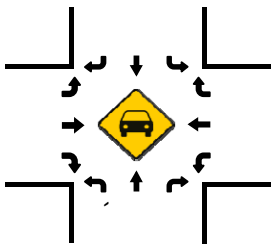
Total Vehicles (Noon)



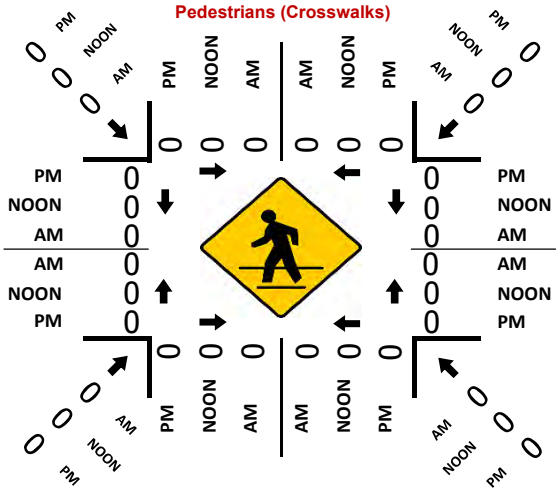
Bikes (NOON)



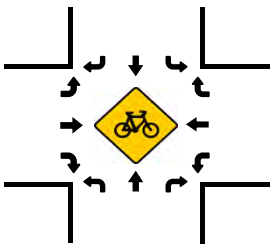
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



APPENDIX C

BUS SCHEDULES

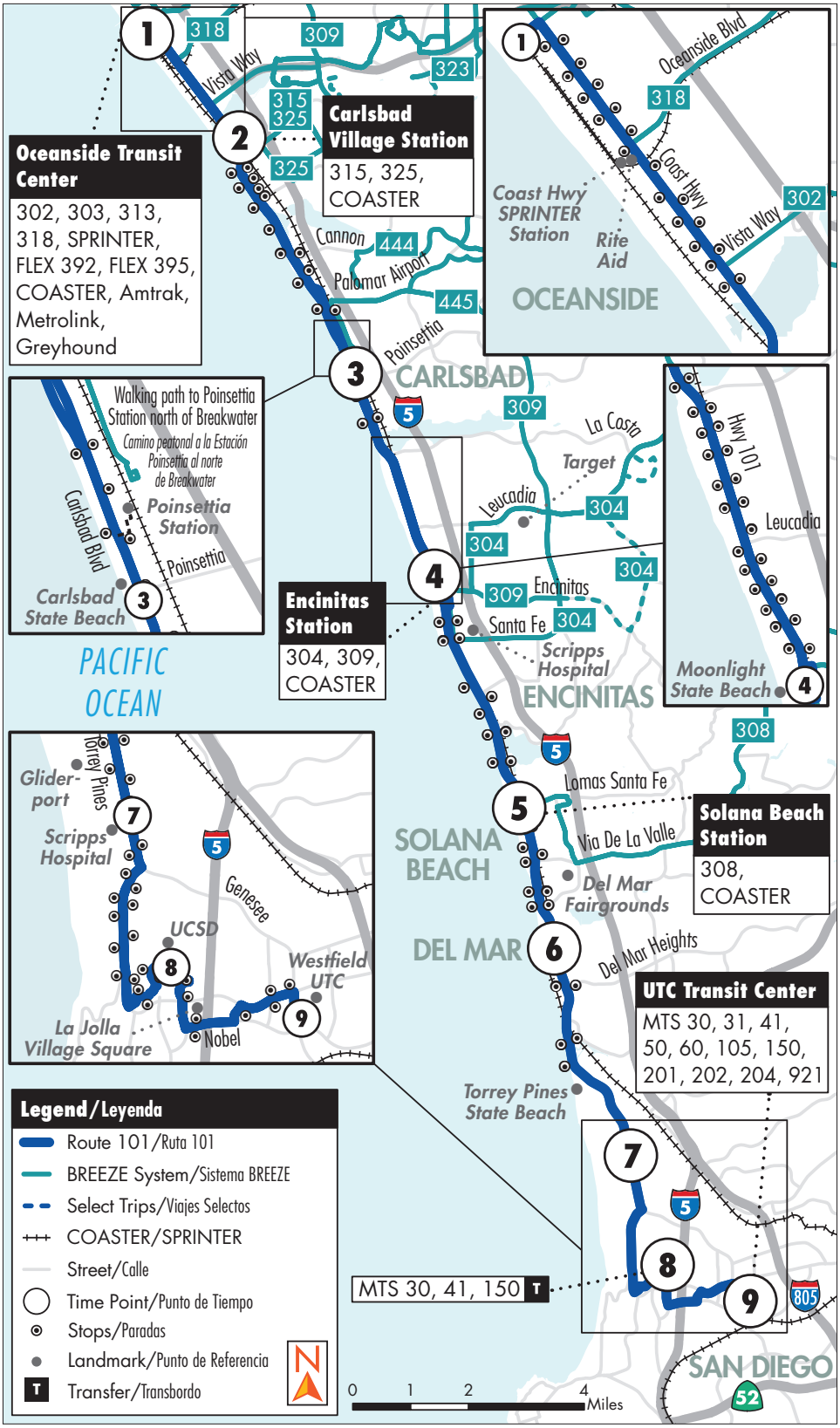
101 Oceanside to VA/UCSD/UTC via Highway 101

Oceanside a VA/UCSD/UTC a través de la autopista 101

M-F • SA • SU
L-V • SÁ • DO

Destinations/Destinos

- University of California, San Diego
- VA Medical Center
- Scripps Green Hospital
- Carlsbad State Beach
- Del Mar Fairgrounds & Racetrack
- Westfield UTC
- Torrey Pines State Beach



101 Oceanside to VA/UCSD/UTC via Highway 101

Oceanside a VA/UCSD/UTC a través de la autopista 101

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Southbound to VA Medical Center/UCSD/UTC
Lunes a Viernes • Dirección hacia el sur a VA Medical Center/UCSD/UTC

Oceanside Transit Center	Carlsbad Village Station	Carlsbad Blvd. & Poinsettia Ln.	Encinitas Station **ARRIVAL**	Encinitas Station **DEPARTURE**	Highway 101 & Lomas Santa Fe Dr.	Camino Del Mar & 15th St.	Torrey Pines & Scripps	Gilman Transit Center	Westfield UTC
1	**2**	**3**	**4**	**4**	**5**	**6**	**7**	**8**	**9**
5:08	5:18	5:29	5:42	5:47	5:56	6:02	6:13	6:26	6:35a
5:38	5:48	5:59	6:12	6:17	6:26	6:32	6:43	6:56	7:06
6:08	6:18	6:30	6:43	6:48	7:01	7:07	7:19	7:35	7:45
6:38	6:49	7:01	7:15	7:20	7:33	7:39	7:51	8:07	8:18
7:08	7:20	7:34	7:52	7:57	8:10	8:17	8:31	8:48	8:59
7:38	7:50	8:04	8:22	8:27	8:40	8:47	9:01	9:18	9:29
8:08	8:20	8:34	8:52	8:57	9:10	9:17	9:30	9:47	9:58
8:38	8:50	9:04	9:22	9:27	9:39	9:46	9:59	10:16	10:27
9:08	9:20	9:34	9:51	9:56	10:08	10:15	10:28	10:45	10:56
9:38	9:50	10:04	10:21	10:26	10:38	10:45	10:58	11:15	11:26
10:08	10:21	10:35	10:53	10:58	11:10	11:17	11:30	11:48	12:00p
10:38	10:51	11:05	11:23	11:28	11:40	11:47	12:00	12:18	12:30
11:08	11:22	11:36	11:54	11:59	12:11	12:18	12:31	12:49	1:01
11:38	11:52	12:06	12:24	12:29	12:41	12:48	1:01	1:19	1:31
12:08	12:22	12:36	12:54	12:59	1:11	1:18	1:32	1:51	2:03
12:38	12:52	1:06	1:24	1:29	1:41	1:48	2:02	2:22	2:34
1:08	1:22	1:36	1:54	1:59	2:11	2:18	2:32	2:52	3:04
1:38	1:52	2:06	2:24	2:29	2:41	2:48	3:02	3:22	3:34
2:08	2:22	2:36	2:54	2:59	3:11	3:18	3:32	3:53	4:05
2:38	2:52	3:06	3:24	3:29	3:42	3:49	4:03	4:24	4:37
3:08	3:23	3:37	3:55	4:00	4:13	4:20	4:34	4:55	5:08
3:38	3:52	4:06	4:24	4:29	4:42	4:49	5:03	5:24	5:37
4:08	4:22	4:36	4:54	4:59	5:12	5:19	5:33	5:54	6:07
4:38	4:52	5:06	5:24	5:29	5:42	5:49	6:03	6:24	6:37
5:08	5:22	5:36	5:53	5:58	6:11	6:18	6:31	6:49	7:02
5:38	5:52	6:05	6:21	6:26	6:39	6:46	6:58	7:16	7:29
6:08	6:21	6:34	6:50	6:55	7:07	7:14	7:26	7:42	7:54
6:38	6:51	7:04	7:20	7:25	7:36	7:43	7:55	8:11	8:22
7:38	7:51	8:04	8:20	8:25	8:36	8:43	8:55	9:12	9:23
8:38	8:50	9:03	9:18	9:23	9:35	9:41	9:53	10:07	10:17
9:38	9:49	10:00	10:13	–	–	–	–	–	–

UCSD students may ride free on all NCTD BREEZE routes and SPRINTER service by showing a valid UCSD ID and qualifying media (U-PASS sticker within expiration date printed on sticker). UCSD Faculty and Staff may ride with an ECO Pass Regional Transit Pass on a PRONTO Card. This program is sponsored by UCSD's Transportation and Parking Services Department. Contact UCSD for more information.
Los estudiantes de UCSD podrán viajar gratis en todas las rutas de NCTD BREEZE y servicio de SPRINTER al mostrar una identificación válida de UCSD, que tenga medios de tarifas calicativos (Calcomanía U-PASS dentro de la fecha de vencimiento imprimida en la calcomanía). Facultad y Personal de UCSD pueden viajar con un pase de Transito Regional ECO Pass en una tarjeta PRONTO. Este programa está patrocinado por el Departamento de Servicios de Transporte y Estacionamientos de UCSD. Póngase en contacto con UCSD para más información.

101 Oceanside to VA/UCSD/UTC via Highway 101

Oceanside a VA/UCSD/UTC a través de la autopista 101

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Northbound to Oceanside
Lunes a Viernes • Dirección hacia el norte a Oceanside

Westfield UTC	Gilman Transit Center	Torrey Pines & Scripps	Camino Del Mar & 15th St.	Highway 101 & Lomas Santa Fe Dr.	Encinitas Station **ARRIVAL**	Encinitas Station **DEPARTURE**	Carlsbad Blvd. & Poinsettia Ln.	Carlsbad Village Station	Oceanside Transit Center
9	**8**	**7**	**6**	**5**	**4**	**4**	**3**	**2**	**1**
–	–	–	–	–	–	5:52	6:03	6:14	6:23a
5:28	5:37	5:48	5:57	6:03	6:17	6:22	6:33	6:44	6:53
5:52	6:02	6:13	6:23	6:29	6:43	6:48	6:59	7:11	7:23
6:16	6:26	6:38	6:49	6:56	7:11	7:16	7:28	7:41	7:53
6:43	6:54	7:07	7:18	7:25	7:40	7:45	7:58	8:11	8:23
7:07	7:19	7:34	7:46	7:54	8:10	8:15	8:28	8:41	8:53
7:33	7:47	8:03	8:15	8:23	8:39	8:44	8:57	9:11	9:23
8:03	8:17	8:33	8:45	8:53	9:09	9:14	9:27	9:41	9:53
8:33	8:47	9:03	9:15	9:23	9:39	9:44	9:57	10:11	10:23
9:03	9:17	9:33	9:45	9:53	10:09	10:14	10:27	10:41	10:53
9:32	9:46	10:02	10:14	10:22	10:38	10:43	10:56	11:10	11:23
10:00	10:14	10:30	10:42	10:50	11:07	11:12	11:25	11:39	11:53
10:30	10:44	11:00	11:12	11:20	11:37	11:42	11:55	**12:09**	**12:23p**
10:57	11:11	11:27	11:39	11:48	**12:05**	**12:10**	**12:23**	**12:38**	**12:53**
11:25	11:39	11:55	**12:07**	**12:17**	**12:35**	**12:40**	**12:53**	**1:08**	**1:23**
11:55	**12:09**	**12:25**	**12:37**	**12:47**	**1:05**	**1:10**	**1:23**	**1:38**	**1:53**
12:25	**12:39**	**12:55**	**1:07**	**1:17**	**1:35**	**1:40**	**1:53**	**2:08**	**2:23**
12:53	**1:07**	**1:23**	**1:35**	**1:45**	**2:05**	**2:10**	**2:23**	**2:38**	**2:53**
1:23	**1:37**	**1:53**	**2:05**	**2:15**	**2:35**	**2:40**	**2:53**	**3:08**	**3:23**
1:52	**2:06**	**2:22**	**2:35**	**2:45**	**3:05**	**3:10**	**3:23**	**3:38**	**3:53**
2:16	**2:30**	**2:46**	**2:59**	**3:10**	**3:30**	**3:35**	**3:49**	**4:07**	**4:23**
2:43	**2:57**	**3:14**	**3:29**	**3:40**	**4:00**	**4:05**	**4:19**	**4:37**	**4:53**
3:10	**3:24**	**3:41**	**3:56**	**4:09**	**4:29**	**4:34**	**4:48**	**5:06**	**5:23**
3:39	**3:53**	**4:10**	**4:25**	**4:38**	**4:58**	**5:03**	**5:18**	**5:36**	**5:53**
4:13	**4:27**	**4:44**	**4:59**	**5:12**	**5:31**	**5:36**	**5:51**	**6:09**	**6:23**
4:47	**5:01**	**5:18**	**5:33**	**5:46**	**6:04**	**6:09**	**6:23**	**6:40**	**6:53**
5:25	**5:39**	**5:56**	**6:10**	**6:20**	**6:37**	**6:42**	**6:55**	**7:10**	**7:23**
6:00	**6:13**	**6:30**	**6:43**	**6:52**	**7:09**	**7:14**	**7:27**	**7:40**	**7:53**
6:33	**6:45**	**7:00**	**7:13**	**7:22**	**7:39**	**7:44**	**7:57**	**8:10**	**8:23**
7:39	**7:51**	**8:05**	**8:17**	**8:25**	**8:42**	**8:47**	**8:59**	**9:12**	**9:23**
8:47	**8:58**	**9:10**	**9:20**	**9:27**	**9:42**	**9:47**	**9:59**	**10:12**	**10:23**
9:49	**10:00**	**10:11**	**10:21**	**10:28**	**10:43**	**10:48**	**11:00**	**11:13**	**11:23**

UCSD students may ride free on all NCTD BREEZE routes and SPRINTER service by showing a valid UCSD ID and qualifying media (U-PASS sticker within expiration date printed on sticker). UCSD Faculty and Staff may ride with an ECO Pass Regional Transit Pass on a PRONTO Card. This program is sponsored by UCSD's Transportation and Parking Services Department. Contact UCSD for more information.
Los estudiantes de UCSD pueden viajar gratis en todas las rutas de NCTD BREEZE y del servicio SPRINTER al mostrar una identificación válida de UCSD con ciertas condiciones elegibles (Calcomanía U-PASS válida de acuerdo a la fecha de vencimiento imprimida en la calcomanía). Facultad y personal de UCSD pueden viajar con un Pase de Tránsito Regional ECO Pass en una tarjeta PRONTO. Este programa está patrocinado por el Departamento de Servicios de Transporte y Estacionamientos de UCSD. Contacte a UCSD para obtener más información.

101 Oceanside to VA/UCSD/UTC via Highway 101

Oceanside a VA/UCSD/UTC a través de la autopista 101

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Saturday & Sunday
Southbound to VA Medical Center/UCSD/UTC
Sábado y Domingo • Dirección hacia el sur a VA Medical Center/UCSD/UTC

Oceanside Transit Center	Carlsbad Village Station	Carlsbad Blvd. & Poinsettia Ln.	Encinitas Station **ARRIVAL**	Encinitas Station **DEPARTURE**	Highway 101 & Lomas Santa Fe Dr.	Camino Del Mar & 15th St.	Torrey Pines & Scripps	Gilman Transit Center	Westfield UTC
1	2	3	4	4	5	6	7	8	9
5:11	5:21	5:32	5:46	5:51	6:02	6:07	6:17	6:27	6:36a
5:38	5:48	5:59	6:13	6:18	6:29	6:34	6:44	6:54	7:03
6:41	6:52	7:04	7:26	7:31	7:42	7:49	7:59	8:11	8:20
7:11	7:22	7:35	7:56	8:01	8:13	8:20	8:30	8:42	8:52
7:41	7:52	8:06	8:26	8:31	8:44	8:51	9:01	9:14	9:24
8:11	8:23	8:37	8:56	9:01	9:14	9:21	9:31	9:44	9:54
8:41	8:53	9:08	9:26	9:31	9:44	9:51	10:01	10:14	10:24
9:11	9:24	9:39	9:56	10:01	10:15	10:22	10:33	10:48	10:58
9:41	9:54	10:09	10:26	10:31	10:45	10:52	11:03	11:18	11:29
10:11	10:25	10:40	10:58	11:03	11:17	11:24	11:35	11:50	**12:01p**
10:41	10:55	11:10	11:28	11:33	11:48	11:55	**12:06**	**12:22**	**12:33**
11:10	11:25	11:40	11:58	**12:03**	**12:19**	**12:26**	**12:38**	**12:54**	**1:05**
11:38	11:54	**12:10**	**12:28**	**12:33**	**12:49**	**12:56**	**1:08**	**1:24**	**1:36**
12:08	**12:24**	**12:40**	**0:58**	**1:03**	**1:20**	**1:27**	**1:39**	**1:55**	**2:08**
12:38	**12:54**	**1:10**	**1:28**	**1:33**	**1:50**	**1:57**	**2:09**	**2:26**	**2:39**
1:07	**1:23**	**1:39**	**1:58**	**2:03**	**2:20**	**2:27**	**2:39**	**2:56**	**3:10**
1:37	**1:53**	**2:09**	**2:28**	**2:33**	**2:50**	**2:57**	**3:09**	**3:26**	**3:40**
2:08	**2:24**	**2:40**	**2:59**	**3:04**	**3:21**	**3:28**	**3:40**	**3:56**	**4:09**
2:39	**2:55**	**3:10**	**3:29**	**3:34**	**3:51**	**3:58**	**4:10**	**4:26**	**4:39**
3:10	**3:26**	**3:41**	**3:59**	**4:04**	**4:20**	**4:27**	**4:39**	**4:54**	**5:07**
3:40	**3:56**	**4:11**	**4:29**	**4:34**	**4:49**	**4:56**	**5:07**	**5:22**	**5:35**
4:10	**4:26**	**4:40**	**4:57**	**5:02**	**5:17**	**5:24**	**5:35**	**5:50**	**6:03**
4:40	**4:56**	**5:10**	**5:27**	**5:32**	**5:47**	**5:54**	**6:05**	**6:20**	**6:33**
5:10	**5:25**	**5:39**	**5:56**	**6:01**	**6:15**	**6:21**	**6:32**	**6:47**	**6:59**
5:40	**5:54**	**6:08**	**6:25**	**6:30**	**6:43**	**6:49**	**7:00**	**7:15**	**7:27**
6:10	**6:24**	**6:38**	**6:54**	**6:59**	**7:12**	**7:18**	**7:29**	**7:42**	**7:54**
6:40	**6:54**	**7:07**	**7:23**	**7:28**	**7:41**	**7:47**	**7:58**	**8:11**	**8:22**
7:40	**7:53**	**8:06**	**8:21**	**8:28**	**8:40**	**8:46**	**8:56**	**9:09**	**9:19**
8:40	**8:52**	**9:05**	**9:20**	**9:28**	**9:40**	**9:46**	**9:56**	**10:09**	**10:19**

UCSD students may ride free on all NCTD BREEZE routes and SPRINTER service by showing a valid UCSD ID and qualifying media (U-PASS sticker within expiration date printed on sticker). UCSD Faculty and Staff may ride with an ECO Pass Regional Transit Pass on a PRONTO Card. This program is sponsored by UCSD's Transportation and Parking Services Department. Contact UCSD for more information.
Los estudiantes de UCSD pueden viajar gratis en todas las rutas de NCTD BREEZE y del servicio SPRINTER al mostrar una identificación válida de UCSD con ciertas condiciones elegibles (Calcomanía U-PASS válida de acuerdo a la fecha de vencimiento imprimida en la calcomanía). Facultad y personal de UCSD pueden viajar con un Pase de Tránsito Regional ECO Pass en una tarjeta PRONTO. Este programa está patrocinado por el Departamento de Servicios de Transporte y Estacionamientos de UCSD. Contacte a UCSD para obtener más información.

101 Oceanside to VA/UCSD/UTC via Highway 101

Oceanside a VA/UCSD/UTC a través de la autopista 101

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Saturday & Sunday
Northbound to Oceanside

Sábado y Domingo • Dirección hacia el norte a Oceanside

Westfield UTC	Gilman Transit Center	Torrey Pines & Scripps	Camino Del Mar & 15th St.	Highway 101 & Lomas Santa Fe Dr.	Encinitas Station ARRIVAL	Encinitas Station DEPARTURE	Carlsbad Blvd. & Poinsettia Ln.	Carlsbad Village Station	Oceanside Transit Center
9	**8**	**7**	**6**	**5**	**4**	**4**	**3**	**2**	**1**
–	–	–	–	–	–	5:44	5:56	6:08	6:19a
5:47	5:56	6:06	6:15	6:23	6:41	6:46	6:58	7:10	7:21
6:14	6:23	6:33	6:42	6:50	7:08	7:13	7:25	7:38	7:49
6:42	6:51	7:02	7:11	7:19	7:37	7:42	7:54	8:07	8:18
7:09	7:18	7:29	7:39	7:47	8:05	8:10	8:23	8:36	8:47
7:35	7:45	7:56	8:07	8:15	8:34	8:39	8:52	9:05	9:17
8:04	8:14	8:25	8:36	8:44	9:03	9:08	9:21	9:35	9:48
8:32	8:42	8:53	9:04	9:12	9:32	9:37	9:50	10:04	10:17
9:01	9:12	9:23	9:34	9:42	10:02	10:07	10:20	10:35	10:49
9:30	9:41	9:52	10:03	10:11	10:31	10:36	10:50	11:05	11:20
9:59	10:10	10:21	10:32	10:41	11:01	11:06	11:20	11:35	11:50
10:30	10:41	10:52	11:03	11:12	11:32	11:37	11:52	**12:08**	**12:23p**
10:57	11:08	11:20	11:32	11:41	**12:01**	**12:06**	**12:21**	**12:37**	**12:53**
11:25	11:37	11:49	**12:01**	**12:10**	**12:30**	**12:35**	**12:50**	**1:06**	**1:23**
11:52	**12:04**	**12:16**	**12:28**	**12:37**	**0:58**	**1:03**	**1:18**	**1:35**	**1:53**
12:21	**12:33**	**12:45**	**12:57**	**1:06**	**1:27**	**1:32**	**1:47**	**2:04**	**2:23**
12:50	**1:02**	**1:14**	**1:26**	**1:35**	**1:56**	**2:01**	**2:16**	**2:33**	**2:53**
1:19	**1:31**	**1:43**	**1:55**	**2:04**	**2:25**	**2:30**	**2:46**	**3:03**	**3:23**
1:49	**2:01**	**2:13**	**2:25**	**2:34**	**2:55**	**3:00**	**3:16**	**3:33**	**3:53**
2:20	**2:32**	**2:44**	**2:56**	**3:05**	**3:25**	**3:30**	**3:46**	**4:03**	**4:23**
2:51	**3:03**	**3:15**	**3:27**	**3:36**	**3:56**	**4:01**	**4:16**	**4:33**	**4:53**
3:22	**3:34**	**3:46**	**3:58**	**4:07**	**4:27**	**4:32**	**4:47**	**5:04**	**5:24**
3:52	**4:04**	**4:16**	**4:28**	**4:37**	**4:57**	**5:02**	**5:17**	**5:34**	**5:53**
4:24	**4:36**	**4:48**	**5:00**	**5:09**	**5:29**	**5:34**	**5:48**	**6:04**	**6:22**
4:56	**5:08**	**5:20**	**5:31**	**5:40**	**6:00**	**6:05**	**6:19**	**6:35**	**6:50**
5:32	**5:44**	**5:56**	**6:07**	**6:15**	**6:33**	**6:38**	**6:52**	**7:08**	**7:23**
6:36	**6:48**	**6:59**	**7:10**	**7:17**	**7:35**	**7:40**	**7:54**	**8:08**	**8:23**
7:41	**7:53**	**8:04**	**8:15**	**8:22**	**8:38**	**8:43**	**8:56**	**9:09**	**9:23**
8:45	**8:56**	**9:07**	**9:17**	**9:24**	**9:40**	**9:45**	**9:58**	**10:11**	**10:23**
9:50	**10:01**	**10:12**	**10:21**	**10:27**	**10:43**	**10:48**	**11:00**	**11:13**	**11:23**

UCSD students may ride free on all NCTD BREEZE routes and SPRINTER service by showing a valid UCSD ID and qualifying media (U-PASS sticker within expiration date printed on sticker). UCSD Faculty and Staff may ride with an ECO Pass Regional Transit Pass on a PRONTO Card. This program is sponsored by UCSD's Transportation and Parking Services Department. Contact UCSD for more information.
Los estudiantes de UCSD pueden viajar gratis en todas las rutas de NCTD BREEZE y del servicio SPRINTER al mostrar una identificación válida de UCSD con ciertas condiciones elegibles (Calcomanía U-PASS válida de acuerdo a la fecha de vencimiento imprimida en la calcomanía). Facultad y personal de UCSD pueden viajar con un Pase de Tránsito Regional ECO Pass en una tarjeta PRONTO. Este programa está patrocinado por el Departamento de Servicios de Transporte y Estacionamientos de UCSD. Contacte a UCSD para obtener más información.

FARES / *Tarifas*

The Sorrento Valley COASTER Connection is a free service for COASTER passengers! This service is provided as a courtesy by the Metropolitan Transit System and the North County Transit District.

¡El Sorrento Valley COASTER Connection es un servicio gratuito para los pasajeros del COASTER! Este servicio es proveído como cortesía por el Metropolitan Transit System y el North County Transit District.

DIRECTORY / *Directorio*

MTS Information & Trip Planning *MTS Información y planeo de viaje*	**(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** **or/ó** **(888) 722-4889**
InfoExpress **(24-hour info via Touch-Tone phone)** *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
MTS Security *MTS Seguridad*	**(619) 595-4960**
Lost & Found *Objetos extraviados*	**(619) 233-3004**
Transit Store	**(619) 234-1060** 12th & Imperial Transit Center M–F 8am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit **sdmts.com.**

*Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en la Transit Store, o visita a **sdmts.com.***

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective SEPTEMBER 26, 2022

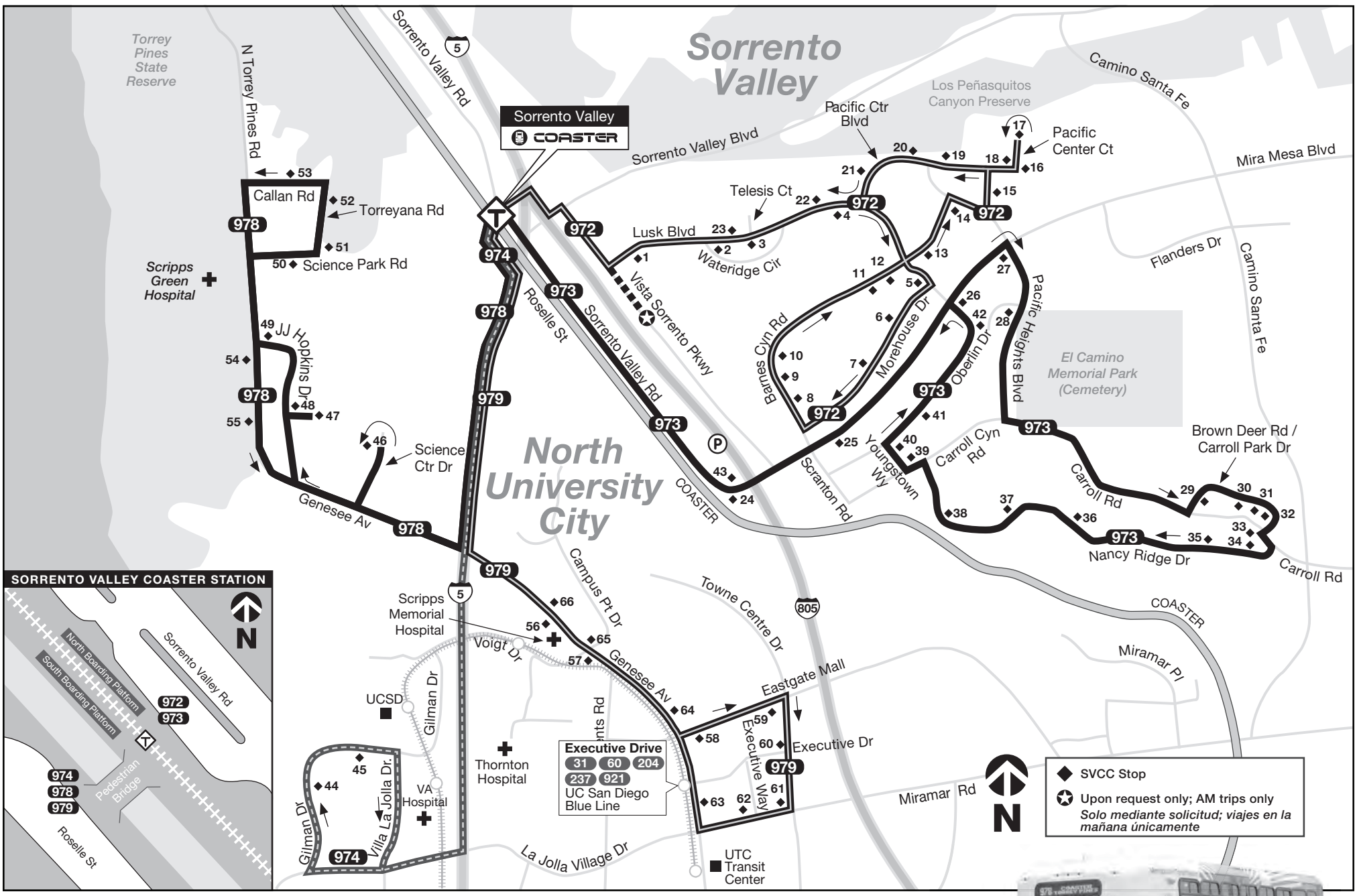
COASTER CONNECTION

Sorrento Valley COASTER Station

972	Sorrento Mesa
973	Carroll Canyon
974	UC San Diego
978	Torrey Pines
979	University City TROLLEY CONNECTION

09/22

sdmts.com
Route Alerts, Updated Schedules, Connections & More



COASTER

Oceanside ➡ San Diego

	Morning (AM)				Afternoon/Evening (PM)				
Oceanside	5:56a	6:36a	7:16a	7:36a	**3:36p**	**4:16p**	**4:36p**	**5:16p**	**6:16p**
Carlsbad Village	6:03	6:43	7:23	7:43	**3:43**	**4:23**	**4:43**	**5:23**	**6:23**
Carlsbad Poinsettia	6:09	6:49	7:29	7:49	**3:49**	**4:29**	**4:49**	**5:29**	**6:29**
Encinitas	6:15	6:55	7:35	7:55	**3:55**	**4:35**	**4:55**	**5:35**	**6:35**
Solana Beach	6:21	7:01	7:41	8:01	**4:01**	**4:41**	**5:01**	**5:41**	**6:41**
Sorrento Valley	6:30	7:10	7:50	8:10	**4:10**	**4:50**	**5:10***	**5:50**	**6:50**
Old Town	6:51	7:31	8:11	8:31	**4:31**	**5:11**	**5:31**	**6:11**	**7:11**
San Diego	6:57	7:37	8:17	8:37	**4:37**	**5:17**	**5:37**	**6:17**	**7:17**

San Diego ➡ Oceanside

	Morning (AM)		Afternoon/Evening (PM)				
San Diego	6:40a	7:40a	**3:40p**	**4:20p**	**5:20p**	**5:40p**	**6:20p**
Old Town	6:47	7:47	**3:47**	**4:27**	**5:27**	**5:47**	**6:27**
Sorrento Valley	7:09	8:09	**4:09**	**4:49**	**5:49**	**6:09***	**6:49**
Solana Beach	7:19	8:19	**4:19**	**4:59**	**5:59**	**6:19**	**6:59**
Encinitas	7:25	8:25	**4:25**	**5:05**	**6:05**	**6:25**	**7:05**
Carlsbad Poinsettia	7:31	8:31	**4:31**	**5:11**	**6:11**	**6:31**	**7:11**
Carlsbad Village	7:37	8:37	**4:37**	**5:17**	**6:17**	**6:37**	**7:17**
Oceanside	7:42	8:42	**4:42**	**5:22**	**6:22**	**6:42**	**7:22**

COASTER schedule shown is effective November 21, 2021 and is subject to change without notice. This may not reflect the most current schedule. Only trips that connect with the Sorrento Valley COASTER Connection are shown. Additional days and times of service can be found at www.gonctd.com.
COASTER calendario que se muestra es a partir del 21 de noviembre de 2021 y está sujeto a cambios sin previo aviso. Esto puede no reflejar el calendario más actual. Sólo los viajes que conectan con el Sorrento Valley COASTER Connection se muestran. Días adicionales y las horas de servicio se pueden encontrar en www.gonctd.com.

* This COASTER Connection trip is operated by North County Transit District. Visit goNCTD.com for details. / *Este viaje COASTER Connection operado por North County Transit District. Visite a goNCTD.com para detalles.*

ROUTE DEVIATIONS / *Desviaciones de la Ruta*

Effective October 25, 2021
SVCC services can provide a deviation of up to 3/4 of a mile off of the route for requesting passengers traveling to or from the Sorrento Valley COASTER Station during the corresponding hours that the SVCC service operates. SVCC route deviations are only provided in areas where ADA complementary paratransit service is not available on MTS Access or NCTD LIFT. Please call (877) 841-3278 for more information.

A partir de 25 de octubre de 2021
Los servicios de SVCC pueden desviarse hasta 3/4 de milla fuera de la ruta para pasajeros solicitantes que viajen hacia o desde la estación COASTER de Sorrento Valley durante las horas correspondientes en que opera el servicio de SVCC. Las desviaciones de la ruta de SVCC solo se proporcionan en áreas donde el servicio de paratránsito complementario de la ADA no está disponible en MTS Access o NCTD LIFT. Llame al (877) 841-3278 para obtener más información.

COMMUTER TAX BENEFIT PROGRAM FOR EMPLOYERS / *Programa de Asistencia de Tránsito del Empleador*

Employers can provide their employees a payroll tax deduction for riding transit to work of up to $125 per month. Employers benefit from this program through reduced payroll taxes and other business deductions. For more information about this and other free commuter services for employers visit iCommuteSD.com or call 511 and say "iCommute".

Los empleadores pueden proporcionar a sus empleados una deducción de los impuestos sobre nóminas de hasta $125 dólares al mes por trasladarse al trabajo usando el transporte interurbano. Los empleadores sacan provecho de este programa mediante menores impuestos sobre nómina y otras deducciones empresariales. Para mayores informes sobre éste y otros servicios gratuitos para pasajeros interurbanos para los empleadores, favor de visitar iCommuteSD.com o llamar al 511 y decir 'iCommute'.

Alternative formats available upon request. Please call: (619) 557-4555 / Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555

Route 972 – Monday through Friday / *lunes a viernes*

Sorrento Mesa ➡ Sorrento Valley COASTER Station

		Morning (AM)				Afternoon/Evening (PM)					
Ⓣ	Sorrento Valley COASTER Station **DEPART***	6:30a	7:10a	7:50a	8:16a	—	**4:05p**		**5:05p**		**6:05p**
1	10525 Vista Sorrento Pkwy.					**3:33p**					
2	EB Lusk Blvd & Wateridge Circle (after intersection)										
3	EB Lusk Blvd & Telesis Ct. (after intersection)										
4	Across from 6455 Lusk Blvd.	6:37	7:17	7:57	8:23	**3:34**	**4:14**		**5:14**		**6:14**
5	10225 Lusk Blvd. (electrical boxes)										
6	Across from 5525 Morehouse Drive										
7	5510 Morehouse Drive										
8	5424 Scranton Road										
9	9605 Scranton Road										
10	9805 Scranton Road										
11	10055 Barnes Canyon Road										
12	10225 Barnes Canyon Road										
13	EB Barnes Canyon Road & Lusk Blvd. (after intersection)	6:43	7:23	8:03	8:29	**3:40**	**4:20**	▲	**5:20**	▲	**6:20**
14	EB Barnes Canyon Road & Pacific Heights Blvd. (before turn)										
15	10211 Pacific Mesa Blvd.										
16	10309 Pacific Center Ct.										
17	10450 Pacific Center Ct.										
18	5910 Pacific Center Blvd.										
19	5788 Pacific Center Blvd.										
20	5764 Pacific Center Blvd.										
21	WB Pacific Center Blvd & McKellar Ct. (after intersection)										
22	Qualcomm Design Center (45 mph sign)	6:51	7:31	8:11	8:37	**3:48**	**4:28**		**5:28**		**6:28**
23	WB Lusk Blvd & Telesis Ct. (after intersection)										
Ⓣ	Sorrento Valley COASTER Station **ARRIVE**	6:57	7:37	8:16	—	**3:57**	**4:37**	**4:58p**	**5:37**	**5:57p**	**6:37**

Route 973 – Monday through Friday / *lunes a viernes*

Carroll Canyon ➡ Sorrento Valley COASTER Station

		Morning (AM)				Afternoon/Evening (PM)					
Ⓣ	Sorrento Valley COASTER Station **DEPART***	6:30a	7:10a	7:50a	8:19a	—	**4:06p**		**5:06p**		**6:06p**
24	10240 Sorrento Valley Road					—					
25	EB Mira Mesa Blvd. & Scranton Road (after intersection)					**3:33p**					
26	EB Mira Mesa Blvd. & Oberlin Drive (after intersection)										
27	Pacific Heights Blvd. & Mira Mesa Blvd. (after turn, electrical boxes)	6:38	7:18	7:58	8:27	**3:34**	**4:14**		**5:14**		**6:14**
28	Pacific Heights Blvd. & Cornerstone Ct. (after intersection)										
29	Brown Deer Road & Ferris Square (at pedestrian crossing sign)										
30	9215 Brown Deer Road										
31	9339 Carroll Park Drive										
32	9449 Carroll Park Drive										
33	Nancy Ridge Drive & Carroll Road (after turn, Carroll Ridge Bus. Park)	6:47	7:27	8:06	8:36	**3:43**	**4:23**		**5:23**		**6:23**
34	6868 Nancy Ridge Drive							▲		▲	
35	6650 Nancy Ridge Drive										
36	6310 Nancy Ridge Drive (electrical boxes in front of Nancy Ridge Technology Park)										
37	6150 Nancy Ridge Drive (Sorrento Ridge Business Park)										
38	5960 Nancy Ridge Drive (Sorrento Vista Industrial Park)										
39	5280 Carroll Canyon Road										
40	Youngstown Way & Oberlin Drive (before turn, at fire hydrant)										
41	5807 Oberlin Drive										
42	5871 Oberlin Drive (mailboxes)	6:51	7:31	8:10	8:40	**3:47**	**4:27**		**5:27**		**6:27**
43	Across street from 10260 Sorrento Valley Rd.										
Ⓣ	Sorrento Valley COASTER Station **ARRIVE**	7:00	7:40	8:19	—	**3:57**	**4:37**	**4:58p**	**5:37**	**5:57p**	**6:37**

Route 974 – Monday through Friday / *lunes a viernes*

UC San Diego ➡ Sorrento Valley COASTER Station

		Morning (AM)				Afternoon/Evening (PM)					
Ⓣ	Sorrento Valley COASTER Station **DEPART***	6:30a	7:10a	7:50a	8:12a	—	**4:11p**		**5:11p**		**6:12p**
44	Gilman Drive & Eucalyptus Grove Lane										
45	Gilman Transit Center (UCSD)	6:39	7:20	8:00	8:22	**3:44p**	**4:23**	▲	**5:23**	▲	**6:24**
Ⓣ	Sorrento Valley COASTER Station **ARRIVE**	6:50	7:32	8:12	—	**3:57**	**4:37**	**4:58p**	**5:37**	**5:57p**	**6:37**

Route 978 – Monday through Friday / *lunes a viernes*

Torrey Pines ➡ Sorrento Valley COASTER Station

		Morning (AM)				Afternoon/Evening (PM)					
Ⓣ	Sorrento Valley COASTER Station **DEPART***	6:30a	7:10a	7:50a	8:19a	—	**4:10p**		**5:07p**		**6:06p**
46	10350 Science Center Drive	6:36	7:16	7:56	8:25	**3:38p**	**4:16**		**5:15**		**6:16**
47	General Atomics Court (at end of turnaround)										
48	General Atomics Court & John Hopkins Drive (before turn)										
49	John Hopkins Drive & North Torrey Pines Road (before turn)										
50	3033 Science Park Road										
51	Torreyana Rd. & Road to the Cure (before intersection)										
52	Torreyana Rd. & Callan Road (before turn)	6:43	7:23	8:02	8:32	**3:45**	**4:23**	▲	**5:22**	▲	**6:23**
53	11099 Callan Road										
54	10666 North Torrey Pines Road	6:46	7:26	8:05	8:35	**3:48**	**4:26**		**5:25**		**6:26**
55	3366 North Torrey Pines Road										
Ⓣ	Sorrento Valley COASTER Station **ARRIVE**	7:04	7:42	8:19	—	**3:57**	**4:37**	**4:58p**	**5:37**	**5:57p**	**6:37**

Route 979 – Monday through Friday / *lunes a viernes*

University City ➡ Sorrento Valley COASTER Station

		Morning (AM)				Afternoon/Evening (PM)					
Ⓣ	Sorrento Valley COASTER Station **DEPART***	6:30a	7:10a	7:50a	8:14a	—	**4:08p**		**5:08p**		**6:10p**
56	SB Genesee Ave. & Scripps Driveway (after intersection)					—					
57	SB Genesee Ave. & Campus Point Drive (after intersection)	6:37	7:17	7:57	8:21	**3:37p**	**4:15**		**5:15**		**6:17**
58	EB Eastgate Mall & Easter Way (before intersection)										
59	EB Eastgate Mall & Towne Centre Way (before turn)										
60	Towne Centre Way & Executive Drive (before turn)										
61	La Jolla Village Dr. & Towne Centre Dr. (after turn)										
62	La Jolla Village Dr. & Executive Way	6:43	7:23	8:03	8:27	**3:43**	**4:21**	▲	**5:21**	▲	**6:23**
63	NB Genesee Av. @ Executive Dr. Trolley Station (Blue Line Transfer)										
64	NB Genesee Ave. & Eastgate Mall (after intersection)										
65	NB Genesee Ave. & Campus Point Drive (after intersection)										
66	NB Genesee Ave. & Scripps Driveway (after intersection)										
Ⓣ	Sorrento Valley COASTER Station **ARRIVE**	6:54	7:34	8:14	—	**3:57**	**4:37**	**4:58p**	**5:37**	**5:57p**	**6:37**

Routes 972, 973, 974, 978, and 979 do not operate on weekends or on the observation of the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas
Las rutas 972, 973, 974, 978 y 979 no ofrecen servicio durante el fin de semana ó durante los siguientes días festivos: Año Nuevo, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias, y Navidad

* All morning departures from Sorrento Valley COASTER Station wait for the arriving southbound train. Morning buses may depart the station earlier than time shown, once all passengers have transferred from the designated COASTER train. Afternoon departures from Sorrento Valley COASTER Station may leave up to ten minutes earlier than shown.

Todas las salidas de Sorrento Valley COASTER Station en la mañana esperan la llegada del tren hacia el sur. En la mañana, cuando todos los pasajeros del COASTER se han trasladado a los autobuses, los autobuses podrán salir de la estación, aunque sea unos minutos antes del horario. En la tarde, las salidas de Sorrento Valley COASTER Station pueden salir hasta diez minutos antes de lo mostrado.

▲ Trip is operated by North County Transit District. Visit goNCTD.com for details.
Este viaje operado por North County Transit District. Visite a goNCTD.com para detalles.

Exact fare, please *Favor de pagar la cantidad exacta*

Fares *Tarifas*	Adult *Adulto*	Senior/Disabled/ Medicare/Youth* *Personas Mayores/con Discapacidades/Medicare/Jóvenes**
ONE-WAY FARES *Tarifas Sencillas*	$2.50	$1.25
EARNED DAY PASS *Pase del Día Ganado*	$6.00	$3.00
MONTH PASS *Pase mensual*	$72.00	$23.00

Load money into your PRONTO account to earn Day Passes and Month Passes. Tap your PRONTO card ($2) or scan your PRONTO mobile app (free) to ride. *Carga dinero a tu cuenta de PRONTO para ganar Pases del Día y Pases Mensuales. Toca tu tarjeta PRONTO ($2) o escanea tu aplicación móvil PRONTO (gratis) para viajar.*

- **One-ways with PRONTO receive free transfers for two hours. No free transfers for cash.** *Los viajes de ida con PRONTO reciben transbordes gratuitos por dos horas. No se permiten transbordes gratuitos con pagos en efectivo.*
- **Day Passes not sold in advance. Earned with PRONTO.** *Los pases diarios no se venden por adelantado. Se obtienen con PRONTO.*
- **A month pass can be purchased in advanced or earned with PRONTO. Good from first day to last day of the month.** *El Pase Mensual se puede comprar por adelantado o se obtiene mientras viaja con PRONTO. Válido desde el primer día hasta el último día del mes.*

*Proof of eligibility required. Senior Eligibility: Age 65+ or born on or before September 1, 1959. Youth Eligibility: Ages 6-18
Se requiere verificación de elegibilidad. Elegibilidad para Personas Mayores: Edad 65+ o nacido en o antes del 1 de septiembre, 1959. Elegibilidad para Jóvenes: edades 6-18

For more information, visit: / *Para más información, visite:* **sdmts.com/fares**

DIRECTORY / *Directorio*

MTS Information & Trip Planning *MTS Información y planeo de viaje*	**(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005 or/ó (888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
MTS Security *MTS Seguridad*	**(619) 595-4960**
Lost & Found *Objetos extraviados*	**(619) 233-3004**
Transit Store	**(619) 234-1060** 12th & Imperial Transit Center M–F 8am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit **sdmts.com.**

Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en la Transit Store, o visita a ***sdmts.com.***

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective SEPTEMBER 4, 2022

985

UC San Diego - N. Torrey Pines

via North Torrey Pines Road

DESTINATIONS
- Scripps Green Hospital
- UC San Diego North Campus

TROLLEY CONNECTIONS
- UC San Diego Central Campus

09/22

sdmts.com
Route Alerts, Updated Schedules, Connections & More

Route 985 – Monday through Friday / *lunes a viernes*

UC San Diego ➡ N. Torrey Pines ➡ UC San Diego (morning)

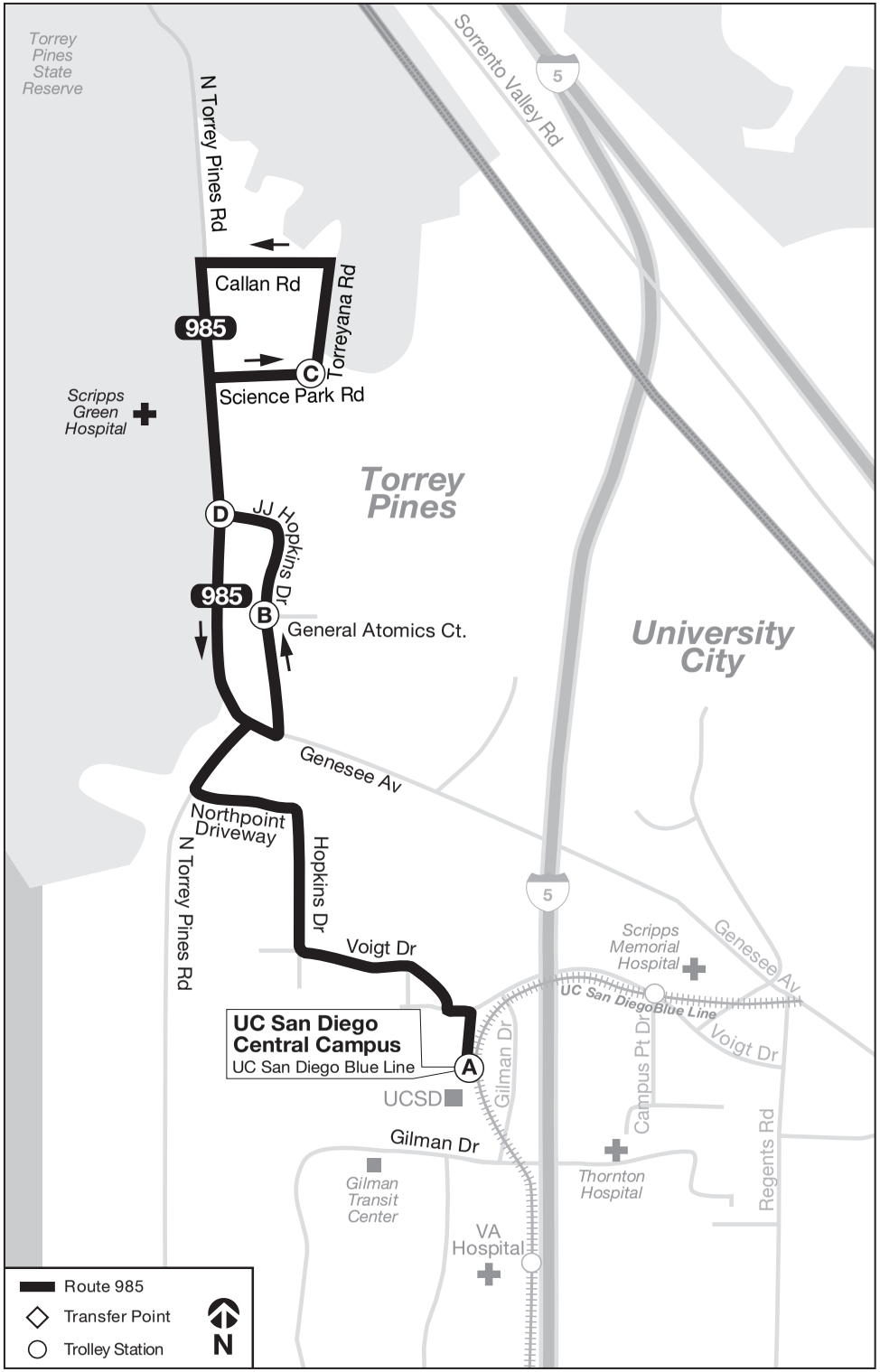
Ⓐ UC San Diego Central Campus Station **DEPART**	Ⓑ John Jay Hopkins Dr. & General Atomics Ct.	Ⓒ Torreyana Rd. & Science Park Rd	Ⓓ N. Torrey Pines Rd. & John J. Hopkins Dr.	Ⓐ UC San Diego Central Campus Station **ARRIVE**
6:12a	6:18a	6:22a	6:26a	6:36a
6:27	6:33	6:37	6:41	6:51
6:42	6:48	6:52	6:56	7:06
6:57	7:03	7:07	7:11	7:21
7:12	7:18	7:22	7:26	7:36
7:27	7:33	7:37	7:41	7:51
7:42	7:48	7:52	7:56	8:06
7:57	8:03	8:07	8:11	8:21
8:12	8:18	8:22	8:26	8:36
8:27	8:33	8:37	8:41	8:51
8:42	8:48	8:52	8:56	9:06
8:57	9:03	9:07	9:11	—
9:12	9:18	9:22	9:26	—

Route 985 does not operate on weekends or on the following holidays and observed holidays:
La ruta 985 no ofrece servicio durante el fin de semana ó durante los siguientes días festivos y feriados observados:

New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

UC San Diego ➡ N. Torrey Pines ➡ UC San Diego (afternoon)

Ⓐ UC San Diego Central Campus Station **DEPART**	Ⓑ John Jay Hopkins Dr. & General Atomics Ct.	Ⓒ Torreyana Rd. & Science Park Rd	Ⓓ N. Torrey Pines Rd. & John J. Hopkins Dr.	Ⓐ UC San Diego Central Campus Station **ARRIVE**
—	**2:59p**	**3:03p**	**3:07p**	**3:17p**
—	**3:14**	**3:18**	**3:22**	**3:32**
3:23p	**3:29**	**3:33**	**3:37**	**3:47**
3:38	**3:44**	**3:48**	**3:52**	**4:02**
3:53	**3:59**	**4:03**	**4:07**	**4:17**
4:08	**4:14**	**4:18**	**4:22**	**4:32**
4:23	**4:29**	**4:33**	**4:37**	**4:47**
4:38	**4:44**	**4:48**	**4:52**	**5:02**
4:53	**4:59**	**5:03**	**5:07**	**5:17**
5:08	**5:14**	**5:18**	**5:22**	**5:32**
5:23	**5:29**	**5:33**	**5:37**	**5:47**
5:38	**5:44**	**5:48**	**5:52**	**6:02**
5:53	**5:59**	**6:03**	**6:07**	**6:17**
6:08	**6:14**	**6:18**	**6:22**	**6:32**
6:38	**6:44**	**6:48**	**6:52**	**7:02**
7:08	**7:14**	**7:18**	**7:22**	**7:32**



Alternative formats available upon request. Please call: (619) 557-4555
Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.

Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

APPENDIX D

SIGNAL TIMING PLANS

2070 Controller TSCP Timing Chart

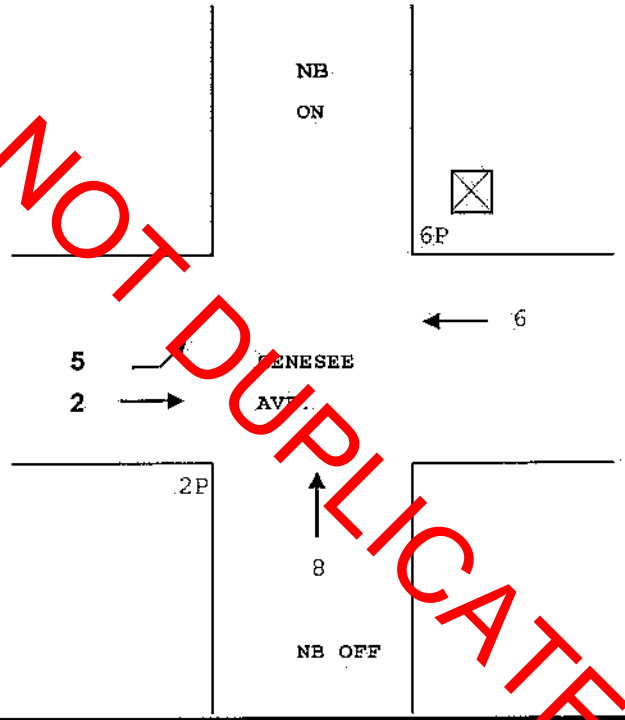
TSCP: 2.23 PAGE 1

Location: I-5 NB @ Genesee Ave.
System:
Master At: NB Ramp
District:
I/C:
Designed By:
Installed By:
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed: 6/22/2021

		FLASH
PHASE	1)	[ ]
	2) EB Genesee	[ ]
	3)	[ ]
	4)	[ ]
	5) EB to NB Ramp	[ ]
	6) WB Genesee	[ ]
	7)	[ ]
	8) NB Off Ramp	[ ]
OVERLAP	A)	[ ]
	B)	[ ]
	C)	[ ]
	D)	[ ]
	E)	[ ]
	F)	[ ]

Intersection Layout



Comments and Notes:
Ped Measurment (FT)
02 = 88 06 = 76

Bike Measurment (FT)
02 = 105 06 = 80

RAM Checksum

Page 2: EE46	Page 8: 5A6B
Page 3: 8168	Page 9: D2FD
Page 4: C369	Page 10: D7C1
Page 5: 191A	Page 11: C3CB
Page 6: 191A	Page 12: D68F
Page 7: E83D	Page 13: 84E7

Post Mile: I 29.454 I-5 NB @ Genesee

Printed: 2/2021

CONFIGURATION PHASE FLAGS

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	. 2 . . 5 6 . 8
Restricted	. . . . .

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . .
Yellow	. . . . .
Force/Max	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. . . . .
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	. . . . 5 . . 8
Pedestrian Calls	. 2 . . . 6 . .
Yellow Start Overlaps	. . . . .
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. 2 . . . . .
P3	. . . . .
P4	. . . . .
P5	. . . . .
P6	. . . . . 6 . .
P7	. . . . .
P8	. . . . .

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	10	0	7	0	0
Flash Don't Walk	0	17	0	10	0	15	0	0
Minimum Green	10	14	10	10	5	12	10	5
Det Limit	10	0	10	10	0	0	10	0
Max Initial	10	0	10	10	0	0	10	0
Max Green 1	50	35	50	50	35	35	50	40
Max Green 2	50	0	50	50	0	0	50	0
Max Green 3	50	0	50	50	0	0	50	0
Extension	5.0	2.0	5.0	5.0	2.0	2.0	5.0	2.0
Maximum Gap	5.0	2.0	5.0	5.0	2.0	2.0	5.0	2.0
Minimum Gap	5.0	2.0	5.0	5.0	2.0	2.0	5.0	2.0
Add Per Vehicle	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0
Reduce Gap By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yellow	5.0	5.2	5.0	5.0	3.2	5.2	5.0	4.1
All-Red	1.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	100		.....	45				45			17	22		40
Plan 2	Green Factor	90		.....	55				51			20	25		24
Plan 3	Green Factor	100		.....	43				65			30	29		20
Plan 4	Green Factor			.....											
Plan 5	Green Factor			.....											
Plan 6	Green Factor			.....											
Plan 7	Green Factor			.....											
Plan 8	Green Factor			.....											
Plan 9	Green Factor			.....											

Master Timer Sync (7-A)	
Enable in Plans	
1-9	.....
11-19	.....
21-29	.....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	.....
Veh Min	Veh Max
.2...6..	.....
Ped	Bike
.....	.....
Cond	Cond Grn
.....	10

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	.....	.....	...5...	.....	.....	.....
Plan 2	.2.4.6.8	.2...6..	.....	.....	....5...	.....	.....	.....
Plan 3	.2.4.6.8	.2...6..	.....	.....	.....	...5...	.....	.....
Plan 4	.....	.....	.....	.....	.....	.....	.....	.....
Plan 5	.....	.....	.....	.....	.....	.....	.....	.....
Plan 6	.....	.....	.....	.....	.....	.....	.....	.....
Plan 7	.....	.....	.....	.....	.....	.....	.....	.....
Plan 8	.....	.....	.....	.....	.....	.....	.....	.....
Plan 9	.....	.....	.....	.....	.....	.....	.....	.....

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-29
254 = Flash
255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor														
Plan 12	Green Factor														
Plan 13	Green Factor														
Plan 14	Green Factor														
Plan 15	Green Factor														
Plan 16	Green Factor														
Plan 17	Green Factor														
Plan 18	Green Factor														
Plan 19	Green Factor														

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11								
Plan 12								
Plan 13								
Plan 14								
Plan 15								
Plan 16								
Plan 17								
Plan 18								
Plan 19								

 Location: I-5 NB @ Genesee Ave. TSCP 2.23

Local Plan 21..29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor														
Plan 22	Green Factor														
Plan 23	Green Factor														
Plan 24	Green Factor														
Plan 25	Green Factor														
Plan 26	Green Factor														
Plan 27	Green Factor														
Plan 28	Green Factor														
Plan 29	Green Factor														

Local Plan 21..29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21								
Plan 22								
Plan 23								
Plan 24								
Plan 25								
Plan 26								
Plan 27								
Plan 28								
Plan 29								

TOD SCHEDULE

Table 1 (8-2-1)

Time	Plan	OS
0645	1	A
1000	2	A
1500	3	A
1830	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Daylight Saving (8-1)

Enabl	YES	Month	Sunday
	Start	MAR	2nd
	End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	.....
Holiday	.....

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1			.....		.....
2			.....		.....
3			.....		.....
4			.....		.....
5			.....		.....
6			.....		.....
7			.....		.....
8			.....		.....
9			.....		.....
10			.....		.....
11			.....		.....
12			.....		.....
13			.....		.....
14			.....		.....
15			.....		.....
16			.....		.....

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing
Delay	
Clear 1	10
Clear 2	
Clear 3	
Hold	
Exit	5
Min Grn	
Ped Clr	

Phase Flags (3-1-2)		
Grn Hold	Yel Flash	Red Flash
.2..5...	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	12345678

Pedestrian Flags (3-1-3)		
Walk	Flash DW	Solid DW
.....	.....	.2.4.6.8
.....	.....	.....
.....	.....	.....
.....	.....	.....

Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	ABCDEF

Exit Parameters (3-1-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	12345678	.2.4.6.8

Configuration (3-1-6)

PR 1	PR 2	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing
Delay	
Clear 1	10
Clear 2	
Clear 3	
Hold	
Exit	
Min Grn	
Ped Clr	

Phase Flags (3-2-2)		
Grn Hold	Yel Flash	Red Flash
...4..7.	.....	.....
.....	.....	.....
.....	.....	.....
123..6..	.....	.....

Pedestrian Flags (3-2-3)		
Walk	Flash DW	Solid DW
.....	.....	.2.4.6.8
.....	.....	.....
.....	.....	.....
.2.....	.....	...4...8

Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Exit Parameters (3-2-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	...4..7.	.....

Configuration (3-2-6)

PR 1	PR 2	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	.2...5...	.....

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	...4..7.	.....

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	1....6..	.....

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	..3....8	.....

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Battery Backup (2-1-5-5)	
Port	Operation
2.7	FLASHING

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6
Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	.....	0.0	NONE	0	0
Plan 11-19	.....	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	.....
	.....

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	.....

Access Utilities (9-5)	
Password	***
Timeout	60

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													.2...6..	.2.4.6.8	.....	.....
Plan D													.2...6..	.2.4.6.8	.....	.....

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					.....	0.0	0.0	0.0	0	0.0	0

2070 Controller TSCP Timing Chart

TSCP: 2.23 PAGE 1

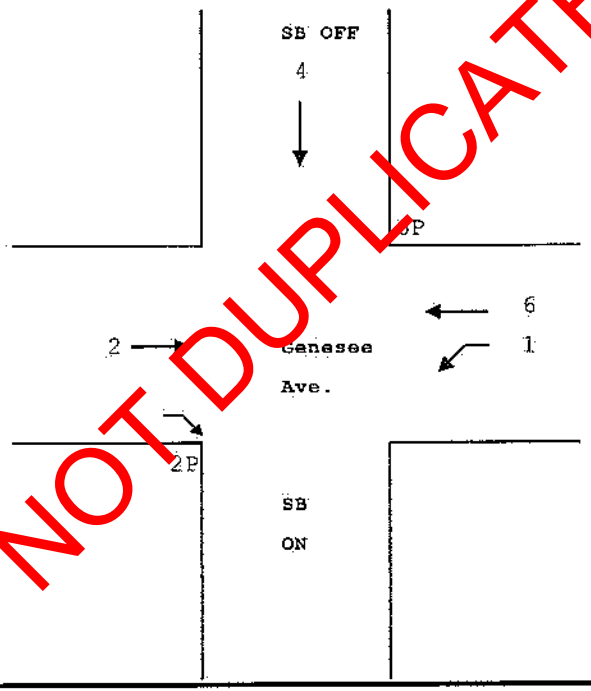
Location: I-5 SB @ Genesee Ave.
System:
Master At: SB Ramp
District: 11
I/C:

Designed By:
Installed By:
Service Info:

Timing Change:	Date Start:	Date End:	Designed:	Installed: 6/22/2021

		FLASH
PHASE	1) WB to SB Ramp	[ ]
	2) EB Genesee	[ ]
	3)	[ ]
	4) SB Off Ramp	[ ]
	5)	[ ]
	6) WB Genesee	[ ]
	7)	[ ]
	8)	[ ]
OVERLAP	A)	[ ]
	B)	[ ]
	C)	[ ]
	D)	[ ]
	E)	[ ]
	F)	[ ]

Intersection Layout



Comments and Notes:
Ped (FT)
02 = 70 06 = 80

Bike (FT)
02 = 80 06 = 100

RAM Checksum

Page 2: 9D03	Page 8: 5A6B
Page 3: A66E	Page 9: D2FD
Page 4: 6567	Page 10: 3DC3
Page 5: 191A	Page 11: 6316
Page 6: 191A	Page 12: D68F
Page 7: 5AA7	Page 13: 84E7

Post Mile: M 29.475 I-5 SB @ Genesee

Printed: 6/22/2021

CONFIGURATION PHASE FLAGS

Cabinet (9-3)
332
Configuration
CALTRANS

Phases (2-1-1-1)	
Permitted	1 2 . 4 . 6 . .
Restricted	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. . . . .
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	1 . . 4 . . . .
Pedestrian Calls	. 2 . . 6 . .
Yellow Start Overlaps	. . . . .
Startup All-Red	6.0

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . .
Yellow	. . . . .
Force/Max	. . . . .

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. 2 . . . . .
P3	. . . . .
P4	. . . . .
P5	. . . . .
P6	. . . . . 6 . .
P7	. . . . .
P8	. . . . .

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	7	0	10
Flash Don't Walk	0	14	0	0	0	16	0	10
Minimum Green	5	12	10	5	10	13	10	10
Det Limit	0	0	10	0	10	0	10	10
Max Initial	0	0	10	0	10	0	10	10
Max Green 1	35	40	50	40	50	40	50	50
Max Green 2	0	0	50	0	50	0	50	50
Max Green 3	0	0	50	0	50	0	50	50
Extension	2.0	2.0	5.0	2.0	5.0	2.0	5.0	5.0
Maximum Gap	2.0	2.0	5.0	2.0	5.0	2.0	5.0	5.0
Minimum Gap	2.0	2.0	5.0	2.0	5.0	2.0	5.0	5.0
Add Per Vehicle	0.0	0.0	1.0	0.0	1.0	0.0	1.0	1.0
Reduce Gap By	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yellow	3.7	5.2	5.0	4.1	5.0	5.2	5.0	5.0
All-Red	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	5.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	OFF

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor	100		.....				18	22		40		45		
Plan 2	Green Factor	90		.....				23	22		25		50		
Plan 3	Green Factor	100		.....				25	30		25		60		
Plan 4	Green Factor			.....											
Plan 5	Green Factor			.....											
Plan 6	Green Factor			.....											
Plan 7	Green Factor			.....											
Plan 8	Green Factor			.....											
Plan 9	Green Factor			.....											

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.2.4.6.8	.2...6..	.....	.....	1.....	.....	.....	.....
Plan 2	.2.4.6.8	.2...6..	.....	.....	1.....	.....	.....	.....
Plan 3	.2.4.6.8	.2...6..	.....	.....	1.....	.....	.....	.....
Plan 4	.....	.....	.....	.....	.....	.....	.....	.....
Plan 5	.....	.....	.....	.....	.....	.....	.....	.....
Plan 6	.....	.....	.....	.....	.....	.....	.....	.....
Plan 7	.....	.....	.....	.....	.....	.....	.....	.....
Plan 8	.....	.....	.....	.....	.....	.....	.....	.....
Plan 9	.....	.....	.....	.....	.....	.....	.....	.....

Master Timer Sync (7-A)	
Enable in Plans	
1-9	.....
11-19	.....
21-29	.....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	.....
Veh Min	Veh Max
.2...6..	.....
Ped	Bike
.....	.....
Cond	Cond Grn
.....	10

MANUAL COMMANDS

Manual Plan (4-1)		*Plan: 1-29*
Plan	OffSet	*254 = Flash*
	A	*255 = Free*
		Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA — COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor														
Plan 12	Green Factor														
Plan 13	Green Factor														
Plan 14	Green Factor														
Plan 15	Green Factor														
Plan 16	Green Factor														
Plan 17	Green Factor														
Plan 18	Green Factor														
Plan 19	Green Factor														

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11								
Plan 12								
Plan 13								
Plan 14								
Plan 15								
Plan 16								
Plan 17								
Plan 18								
Plan 19								

 Location: I-5 SB @ Genesee Ave. TSCP 2.23

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor														
Plan 22	Green Factor														
Plan 23	Green Factor														
Plan 24	Green Factor														
Plan 25	Green Factor														
Plan 26	Green Factor														
Plan 27	Green Factor														
Plan 28	Green Factor														
Plan 29	Green Factor														

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21								
Plan 22								
Plan 23								
Plan 24								
Plan 25								
Plan 26								
Plan 27								
Plan 28								
Plan 29								

TOD SCHEDULE

Table 1 (8-2-1)

Time	Plan	OS
0645	1	A
1000	2	A
1500	3	A
1830	255	A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)

Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Daylight Saving (8-1)

Enabl	YES	Month	Sunday
	Start	MAR	2nd
	End	NOV	1st

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	
Holiday	

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting
100+Action Code = Phases removed
200+Action Code = Phases replaced

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing
Delay	
Clear 1	10
Clear 2	
Clear 3	
Hold	
Exit	5
Min Grn	
Ped Clr	

Phase Flags (3-1-2)		
Grn Hold	Yel Flash	Red Flash
.2..5...	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	12345678

Pedestrian Flags (3-1-3)		
Walk	Flash DW	Solid DW
.....	.....	.2.4.6.8
.....	.....	.....
.....	.....	.....
.....	.....	.....

Overlap Flags (3-1-4)		
Grn Hold	Yel Flash	Red Flash
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	ABCDEF

Exit Parameters (3-1-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	12345678	.2.4.6.8

Configuration (3-1-6)

PR 1	PR 2	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing
Delay	
Clear 1	10
Clear 2	
Clear 3	
Hold	
Exit	
Min Grn	
Ped Clr	

Phase Flags (3-2-2)		
Grn Hold	Yel Flash	Red Flash
...4..7.	.....	.....
.....	.....	.....
.....	.....	.....
123..6..	.....	.....

Pedestrian Flags (3-2-3)		
Walk	Flash DW	Solid DW
.....	.....	.2.4.6.8
.....	.....	.....
.....	.....	.....
.....	.....	...4...8

Overlap Flags (3-2-4)		
Grn Hold	Yel Flash	Red Flash
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Exit Parameters (3-2-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	...4...7.	.....

Configuration (3-2-6)

PR 1	PR 2	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	255	2.....	.....

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	255	...4..7.	.....

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	255	1....6..	.....

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	..3....8	.....

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	
Advance Enable	

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
2.7	FLASHING

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6 Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11..19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	.....	0.0	NONE	0	0
Plan 11-19	.....	0.0	NONE	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	.....
	.....

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	.....

Access Utilities (9-5)	
Password	***
Timeout	60

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs -1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													.2...6..	.2.4.6.8	.....	.....
Plan D													.2...6..	.2.4.6.8	.....	.....

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					.....	0.0	0.0	0.0	0	0.0	0

INTERSECTION: N Torrey Pines Rd @ Science Park Rd/Hi[illegible] Hotel Drwy — 223 P[illegible]ram

Group Assignment:
Field Master Assignment:
N/S Street Name: N Torrey Pines Rd
E/W Street Name: Science Park Rd/Hilton Hotel Drwy
Last Database Change:
System Ref. Number:

N

Column # --->		N Torrey Pines	Science Park	Hilton		N Torrey Pines			
Phase # --->		1	2	3	4	5	6	7	8
Row		⌞	↑	←	↗	↰	↓		
0	Ped Walk		7	7			7		
1	Ped FDW		16	31			7		
2	Min Green	4	10	4	4	6 ~~4~~	20 ~~10~~		
3	Type 3 Limit					0	0		
4	Add/Veh								
5	Veh Extn	2.0	5.2	2.0	2.0	2.0	4.8		
6	Max Gap	2.0	5.2	2.0	2.0	2.0	4.8		
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2		
8	Max Limit	30	60	40	40	30	60		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.6				0.7		
E	Yellow	3.4	4.1 ~~4.6~~	3.9	3.9	3.4	4.1 ~~4.8~~		
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0		

(1) LV3 3/25/15

Phase Timing - Bank 1 <F Page>
F + Phase + Row

Row		E
	RR-1 Delay	
	RR-1 Clear	
	EV-A Delay	0
	EV-A Clear	0
	EV-B Delay	0
	EV-B Clear	0
	EV-C Delay	0
	EV-C Clear	0
	EV-D Delay	0
	EV-D Clear	0
	RR-2 Delay	
	RR-2 Clear	
	View EV Delay	---
	View EV Clear	---
	View RR Delay	---
	View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	123456
1	Red Lock	
2	Yellow Lock	
3	Min Recall	256
4	Ped Recall	
5	Peds (View)	23 6
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	2 6
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	2 6
F	1st Phases	3

Phase Functions <F Page>
F + F + Row

Max Initial	0
Red Revert	5.0
All Red Start	0.0

F + 0 + E
F + 0 + F
F + C + O

Start / Revert Times

Drop Number	8
Zone Number	8
Area Number	4
Area Address	123
QuicNet Channel	COM50

C + 0 + 0
C + 0 + 1
C + 0 + 2
C + 0 + 3
(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	2 4 6	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0
Manual Offset	0

C + A + 1
C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255 (minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: KT
Approved By: FLG
Drawing Number: 28834-D-5
Timing Implemented On: 6/21/13

INTERSECTION: N Torrey Pines Rd @ Science Par d/Hilton Hotel Drwy 223 Pr am

Row	Time	Function	Day of Week	Column F Phases/Bits
0	:			
1	:			
2	:			
3	:			
4	:			
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	
8	Ped 8P	3
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	3
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

Row	1 Delay	3 Carry-over	Detector Name	332 Input File	Detector Number
0				1I1	14
1		1.8		2I2U	1
2				2I2L	5
3				2I3U	21
4		1.8		2I3L	25
5				2I4	9
6				3I5	16
7	10.0			4I6U	3
8				4I6L	7
9				4I7U	23
A				4I7L	27
B				4I8	11
C				1I9U	18
D	10.0			3I9L	20
E	---	---	---	---	---
F	---	---	---	---	---

Row	2 Delay	4 Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8		6J2U	2
2				6J2L	6
3				6J3U	22
4		1.8		6J3L	26
5				6J4	10
6				7J5	15
7				8J6U	4
8				8J6L	8
9				8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
0	1 2 3 4 5 6 7 8	12345678
1	9 10 11 12 -- -- -- --	1234
2	13 14 15 16 17 18 19 20	12345678
3	-- -- -- -- 21 22 23 24	5678
4	-- -- -- -- -- -- -- --	1234
5	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

	0 Detector #
System Det. # 1	
System Det. # 2	
System Det. # 3	
System Det. # 4	
System Det. # 5	
System Det. # 6	
System Det. # 7	
System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: N Torrey Pines Rd @ Science P Rd/Hilton Hotel Drwy 223 Proc n

Coordination Timing By: KT
Implemented On: 5/8/2013

Row	Plan Name -->	1	2	3	4 AM	5	6 PM	7	8	9
0	Cycle Length				130		130			
1	Phase 1 - ForceOff				21		79			
2	Phase 2 - ForceOff				0		0			
3	Phase 3 - ForceOff				64		43			
4	Phase 4 - ForceOff				82		65			
5	Phase 5 - ForceOff				100		81			
6	Phase 6 - ForceOff				21		0			
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset A				99		129			
B	Offset B									
C	Offset C									
D	Permissive				21		13			
E	Hold Release				255		255			
F	Ped Shift				0		0			

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Coordination <C Page>
C + Plan + ROW

Row	Time	Plan	Offset	Day of Week
0	06 : 30	4	A	23456
1	10 : 00	E	A	1234567
2	13 : 00	6	A	23456
3	18 : 30	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination
<9 Key with C+0+9=1>

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

	E	Row		F
		0	Free Lag	
Plan 1		1	Plan 1 - Lag	
Plan 2		2	Plan 2 - Lag	
Plan 3		3	Plan 3 - Lag	
Plan 4	2 6	4	Plan 4 - Lag	1 4 6
Plan 5		5	Plan 5 - Lag	
Plan 6	2 6	6	Plan 6 - Lag	2 4 6
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	5
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

LV3 3/25/15

Sync Phases
C + E + FUNCTION #

Lag Phases <C Page>
C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

APPENDIX E

EXISTING INTERSECTION ANALYSIS CALCULATION SHEETS

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	1	0	0	1	8	22	0	1	0
Future Vol, veh/h	0	0	1	1	0	0	1	8	22	0	1	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	1	0	0	1	9	24	0	1	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	44	56	21	45	44	41	11	0	0	43	0	0
Stage 1	11	11	-	33	33	-	-	-	-	-	-	-
Stage 2	33	45	-	12	11	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	958	835	1056	957	848	1030	1608	-	-	1566	-	-
Stage 1	1010	886	-	983	868	-	-	-	-	-	-	-
Stage 2	983	857	-	1009	886	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	939	817	1036	937	830	1010	1593	-	-	1551	-	-
Mov Cap-2 Maneuver	939	817	-	937	830	-	-	-	-	-	-	-
Stage 1	999	877	-	972	858	-	-	-	-	-	-	-
Stage 2	973	848	-	998	877	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	8.8	0.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1593	-	-	1036	937	1551	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.001	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	8.8	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	84	0	88	0	0	0	34	33	0	0	4	3
Future Vol, veh/h	84	0	88	0	0	0	34	33	0	0	4	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	0	96	0	0	0	37	36	0	0	4	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	0	7.9	7.2
HCM LOS	A	-	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	49%	0%	0%
Vol Thru, %	49%	0%	100%	57%
Vol Right, %	0%	51%	0%	43%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	172	0	7
LT Vol	34	84	0	0
Through Vol	33	0	0	4
RT Vol	0	88	0	3
Lane Flow Rate	73	187	0	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.088	0.201	0	0.009
Departure Headway (Hd)	4.37	3.865	4.218	4.062
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	812	924	0	867
Service Time	2.441	1.913	2.3	2.153
HCM Lane V/C Ratio	0.09	0.202	0	0.009
HCM Control Delay	7.9	7.9	7.3	7.2
HCM Lane LOS	A	A	N	A
HCM 95th-tile Q	0.3	0.7	0	0

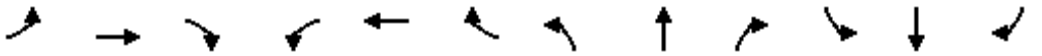
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	137	24	12	3	12
Future Vol, veh/h	22	137	24	12	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	149	26	13	3	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	39	0	-	0	230	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1571	-	-	-	758	1041
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1571	-	-	-	745	1041
Mov Cap-2 Maneuver	-	-	-	-	745	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1571	-	-	-	964
HCM Lane V/C Ratio	0.015	-	-	-	0.017
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	49	61	8	14	120	556	553	159	623	34
Future Volume (veh/h)	9	4	49	61	8	14	120	556	553	159	623	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.89	1.00		0.92	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	4	53	72	0	15	130	604	601	173	677	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	25	67	276	0	113	155	3114	934	199	3239	972
Arrive On Green	0.05	0.05	0.05	0.08	0.00	0.08	0.09	0.61	0.61	0.11	0.63	0.63
Sat Flow, veh/h	1290	516	1403	3563	0	1463	1781	5106	1531	1781	5106	1532
Grp Volume(v), veh/h	14	0	53	72	0	15	130	604	601	173	677	37
Grp Sat Flow(s),veh/h/ln	1806	0	1403	1781	0	1463	1781	1702	1531	1781	1702	1532
Q Serve(g_s), s	1.0	0.0	4.9	2.5	0.0	1.2	9.3	6.8	32.8	12.4	7.3	1.2
Cycle Q Clear(g_c), s	1.0	0.0	4.9	2.5	0.0	1.2	9.3	6.8	32.8	12.4	7.3	1.2
Prop In Lane	0.71		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	87	0	67	276	0	113	155	3114	934	199	3239	972
V/C Ratio(X)	0.16	0.00	0.79	0.26	0.00	0.13	0.84	0.19	0.64	0.87	0.21	0.04
Avail Cap(c_a), veh/h	99	0	77	1044	0	429	227	3114	934	285	3239	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.4	0.0	61.2	56.5	0.0	55.9	58.5	11.2	16.3	56.8	10.0	8.9
Incr Delay (d2), s/veh	0.3	0.0	31.8	0.2	0.0	0.2	11.1	0.1	3.4	13.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.3	1.1	0.0	0.5	4.6	2.4	11.3	6.2	2.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.7	0.0	93.0	56.6	0.0	56.1	69.6	11.4	19.7	70.5	10.2	9.0
LnGrp LOS	E	A	F	E	A	E	E	B	B	E	B	A
Approach Vol, veh/h		67			87			1335			887	
Approach Delay, s/veh		86.1			56.5			20.8			21.9	
Approach LOS		F			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.9	85.0		11.1	15.7	88.2		15.0				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	20.8	44.1		7.1	16.6	48.3		38.1				
Max Q Clear Time (g_c+I1), s	14.4	34.8		6.9	11.3	9.3		4.5				
Green Ext Time (p_c), s	0.1	6.7		0.0	0.1	9.3		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		24.3	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	510	123	181	1871	0	0	0	0	1477	1	1487
Future Volume (veh/h)	0	510	123	181	1871	0	0	0	0	1477	1	1487
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	554	134	197	2034	0				1606	0	1616
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1928	672	264	1930	0				1742	0	1515
Arrive On Green	0.00	0.25	0.25	0.03	0.12	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	7930	2640	3456	5274	0				3563	0	3099
Grp Volume(v), veh/h	0	554	134	197	2034	0				1606	0	1616
Grp Sat Flow(s),veh/h/ln	0	1515	1320	1728	1702	0				1781	0	1549
Q Serve(g_s), s	0.0	5.9	4.0	5.7	37.8	0.0				41.9	0.0	48.9
Cycle Q Clear(g_c), s	0.0	5.9	4.0	5.7	37.8	0.0				41.9	0.0	48.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1928	672	264	1930	0				1742	0	1515
V/C Ratio(X)	0.00	0.29	0.20	0.74	1.05	0.00				0.92	0.00	1.07
Avail Cap(c_a), veh/h	0	1928	672	287	1930	0				1742	0	1515
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.72	0.72	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.0	29.3	47.8	43.8	0.0				23.8	0.0	25.6
Incr Delay (d2), s/veh	0.0	0.4	0.7	5.8	33.7	0.0				8.4	0.0	43.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.1	1.3	2.6	23.0	0.0				18.6	0.0	25.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.4	29.9	53.5	77.4	0.0				32.2	0.0	68.7
LnGrp LOS	A	C	C	D	F	A				C	A	F
Approach Vol, veh/h		688			2231						3222	
Approach Delay, s/veh		30.3			75.3						50.5	
Approach LOS		C			E						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.4	32.6		55.0		45.0
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 8.3	24.8		48.9		37.8
Max Q Clear Time (g_c+I1), s	7.7	7.9		50.9		39.8
Green Ext Time (p_c), s	0.0	2.3		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.3
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	208	1728	0	0	682	604	1294	3	1035	0	0	0
Future Volume (veh/h)	208	1728	0	0	682	604	1294	3	1035	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	226	1878	0	0	741	657	1409	0	1125			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	297	2204	0	0	2225	779	1551	0	1348			
Arrive On Green	0.03	0.14	0.00	0.00	0.29	0.29	0.44	0.00	0.44			
Sat Flow, veh/h	3456	5274	0	0	7930	2653	3563	0	3095			
Grp Volume(v), veh/h	226	1878	0	0	741	657	1409	0	1125			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1326	1781	0	1547			
Q Serve(g_s), s	6.5	35.9	0.0	0.0	7.7	23.3	36.9	0.0	32.2			
Cycle Q Clear(g_c), s	6.5	35.9	0.0	0.0	7.7	23.3	36.9	0.0	32.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	297	2204	0	0	2225	779	1551	0	1348			
V/C Ratio(X)	0.76	0.85	0.00	0.00	0.33	0.84	0.91	0.00	0.83			
Avail Cap(c_a), veh/h	390	2204	0	0	2225	779	1671	0	1451			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.65	0.65	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.6	39.8	0.0	0.0	27.7	33.2	26.4	0.0	25.0			
Incr Delay (d2), s/veh	2.8	2.9	0.0	0.0	0.4	10.8	7.0	0.0	3.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.9	16.7	0.0	0.0	2.7	8.2	16.4	0.0	12.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	42.7	0.0	0.0	28.1	43.9	33.4	0.0	28.8			
LnGrp LOS	D	D	A	A	C	D	C	A	C			
Approach Vol, veh/h		2104			1398			2534				
Approach Delay, s/veh		43.5			35.5			31.3				
Approach LOS		D			D			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		50.4			13.8	36.6		49.6				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		39.8			* 11	23.3		46.9				
Max Q Clear Time (g_c+I1), s		37.9			8.5	25.3		38.9				
Green Ext Time (p_c), s		1.5			0.1	0.0		4.6				

Intersection Summary	
HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	1	20	0	0	0	2	1	0	4	0
Future Vol, veh/h	0	0	1	20	0	0	0	2	1	0	4	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	22	0	0	0	2	1	0	4	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	27	27	24	28	27	23	14	0	0	13	0	0
Stage 1	14	14	-	13	13	-	-	-	-	-	-	-
Stage 2	13	13	-	15	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	983	866	1052	981	866	1054	1604	-	-	1606	-	-
Stage 1	1006	884	-	1007	885	-	-	-	-	-	-	-
Stage 2	1007	885	-	1005	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	964	849	1032	961	849	1034	1589	-	-	1591	-	-
Mov Cap-2 Maneuver	964	849	-	961	849	-	-	-	-	-	-	-
Stage 1	996	875	-	997	876	-	-	-	-	-	-	-
Stage 2	997	876	-	994	875	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	8.8	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1589	-	-	1032	961	1591	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.023	-	-	-
HCM Control Delay (s)	0	-	-	8.5	8.8	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	23	0	0	0	87	6	0	0	40	75
Future Vol, veh/h	4	0	23	0	0	0	87	6	0	0	40	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	25	0	0	0	95	7	0	0	43	82
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	0	7.9	7.2
HCM LOS	A	-	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	94%	15%	0%	0%
Vol Thru, %	6%	0%	100%	35%
Vol Right, %	0%	85%	0%	65%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	93	27	0	115
LT Vol	87	4	0	0
Through Vol	6	0	0	40
RT Vol	0	23	0	75
Lane Flow Rate	101	29	0	125
Geometry Grp	1	1	1	1
Degree of Util (X)	0.12	0.031	0	0.127
Departure Headway (Hd)	4.266	3.837	4.345	3.669
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	841	918	0	974
Service Time	2.29	1.923	2.437	1.705
HCM Lane V/C Ratio	0.12	0.032	0	0.128
HCM Control Delay	7.9	7	7.4	7.2
HCM Lane LOS	A	A	N	A
HCM 95th-tile Q	0.4	0.1	0	0.4

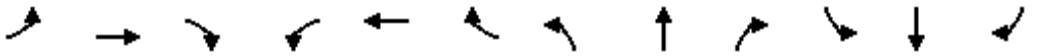
Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	9	142	115	2	56
Future Vol, veh/h	58	9	142	115	2	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	10	154	125	2	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	279	0	-	0	353	217
Stage 1	-	-	-	-	217	-
Stage 2	-	-	-	-	136	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1284	-	-	-	645	823
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1284	-	-	-	613	823
Mov Cap-2 Maneuver	-	-	-	-	613	-
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	890	-

Approach	EB	WB	SB
HCM Control Delay, s	6.9	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1284	-	-	-	813
HCM Lane V/C Ratio	0.049	-	-	-	0.078
HCM Control Delay (s)	7.9	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	2	67	495	4	125	72	921	89	13	593	13
Future Volume (veh/h)	18	2	67	495	4	125	72	921	89	13	593	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.96	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	2	73	541	0	136	78	1001	97	14	645	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	10	92	681	0	291	99	2960	887	22	2739	820
Arrive On Green	0.06	0.06	0.06	0.19	0.00	0.19	0.06	0.58	0.58	0.01	0.54	0.54
Sat Flow, veh/h	1626	163	1442	3563	0	1524	1781	5106	1530	1781	5106	1528
Grp Volume(v), veh/h	22	0	73	541	0	136	78	1001	97	14	645	14
Grp Sat Flow(s),veh/h/ln	1789	0	1442	1781	0	1524	1781	1702	1530	1781	1702	1528
Q Serve(g_s), s	1.5	0.0	6.5	18.8	0.0	10.3	5.6	13.3	3.7	1.0	8.7	0.6
Cycle Q Clear(g_c), s	1.5	0.0	6.5	18.8	0.0	10.3	5.6	13.3	3.7	1.0	8.7	0.6
Prop In Lane	0.91		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	0	92	681	0	291	99	2960	887	22	2739	820
V/C Ratio(X)	0.19	0.00	0.79	0.79	0.00	0.47	0.79	0.34	0.11	0.64	0.24	0.02
Avail Cap(c_a), veh/h	194	0	156	1318	0	564	227	2960	887	77	2739	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.7	0.0	60.0	50.1	0.0	46.7	60.6	14.3	12.3	63.9	16.0	14.1
Incr Delay (d2), s/veh	0.3	0.0	5.7	0.8	0.0	0.4	5.2	0.3	0.2	11.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	2.5	8.5	0.0	4.0	2.6	4.9	1.3	0.5	3.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	0.0	65.7	50.9	0.0	47.1	65.9	14.6	12.5	75.1	16.2	14.1
LnGrp LOS	E	A	E	D	A	D	E	B	B	E	B	B
Approach Vol, veh/h		95			677			1176			673	
Approach Delay, s/veh		63.9			50.2			17.8			17.4	
Approach LOS		E			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	81.1		13.2	11.6	75.4		29.8				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	5.6	42.3		14.1	16.6	31.3		48.1				
Max Q Clear Time (g_c+I1), s	3.0	15.3		8.5	7.6	10.7		20.8				
Green Ext Time (p_c), s	0.0	14.2		0.1	0.0	6.8		1.4				

Intersection Summary			
HCM 6th Ctrl Delay		27.7	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1877	833	408	730	0	0	0	0	406	2	351
Future Volume (veh/h)	0	1877	833	408	730	0	0	0	0	406	2	351
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	2040	905	443	793	0				442	0	382
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	3911	1387	508	3627	0				558	0	475
Arrive On Green	0.00	0.52	0.52	0.29	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	7930	2688	3456	5274	0				3563	0	3029
Grp Volume(v), veh/h	0	2040	905	443	793	0				442	0	382
Grp Sat Flow(s),veh/h/ln	0	1515	1344	1728	1702	0				1781	0	1515
Q Serve(g_s), s	0.0	17.8	24.6	12.2	0.0	0.0				11.9	0.0	12.2
Cycle Q Clear(g_c), s	0.0	17.8	24.6	12.2	0.0	0.0				11.9	0.0	12.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3911	1387	508	3627	0				558	0	475
V/C Ratio(X)	0.00	0.52	0.65	0.87	0.22	0.00				0.79	0.00	0.80
Avail Cap(c_a), veh/h	0	3911	1387	736	3627	0				851	0	724
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.91	0.91	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	17.6	34.4	0.0	0.0				40.6	0.0	40.7
Incr Delay (d2), s/veh	0.0	0.5	2.4	5.4	0.1	0.0				1.4	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.5	7.0	4.5	0.0	0.0				5.3	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.5	20.0	39.8	0.1	0.0				42.0	0.0	42.7
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		2945			1236						824	
Approach Delay, s/veh		17.6			14.3						42.3	
Approach LOS		B			B						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.4	58.8		21.8		78.2
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 21	36.8		23.9		62.8
Max Q Clear Time (g_c+I1), s	14.2	26.6		14.2		2.0
Green Ext Time (p_c), s	0.5	7.8		1.5		3.4

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1274	1013	0	0	822	1481	314	3	193	0	0	0
Future Volume (veh/h)	1274	1013	0	0	822	1481	314	3	193	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.93			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	1385	1101	0	0	893	1501	343	0	210			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	1030	3973	0	0	3242	1146	317	0	263			
Arrive On Green	0.50	1.00	0.00	0.00	0.43	0.43	0.09	0.00	0.09			
Sat Flow, veh/h	3456	5274	0	0	7930	2678	3563	0	2953			
Grp Volume(v), veh/h	1385	1101	0	0	893	1501	343	0	210			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1339	1781	0	1476			
Q Serve(g_s), s	29.8	0.0	0.0	0.0	7.6	42.8	8.9	0.0	7.0			
Cycle Q Clear(g_c), s	29.8	0.0	0.0	0.0	7.6	42.8	8.9	0.0	7.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1030	3973	0	0	3242	1146	317	0	263			
V/C Ratio(X)	1.34	0.28	0.00	0.00	0.28	1.31	1.08	0.00	0.80			
Avail Cap(c_a), veh/h	1030	3973	0	0	3242	1146	317	0	263			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.77	0.77	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.1	0.0	0.0	0.0	18.5	28.6	45.5	0.0	44.7			
Incr Delay (d2), s/veh	160.3	0.1	0.0	0.0	0.2	145.6	74.1	0.0	14.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	30.7	0.0	0.0	0.0	2.5	35.5	7.2	0.0	3.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	185.4	0.1	0.0	0.0	18.8	174.2	119.6	0.0	59.4			
LnGrp LOS	F	A	A	A	B	F	F	A	E			
Approach Vol, veh/h		2486			2394			553				
Approach Delay, s/veh		103.4			116.2			96.8				
Approach LOS		F			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		85.0			35.0	50.0		15.0				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		77.8			* 30	42.8		8.9				
Max Q Clear Time (g_c+I1), s		2.0			31.8	44.8		10.9				
Green Ext Time (p_c), s		5.1			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	108.4
HCM 6th LOS	F

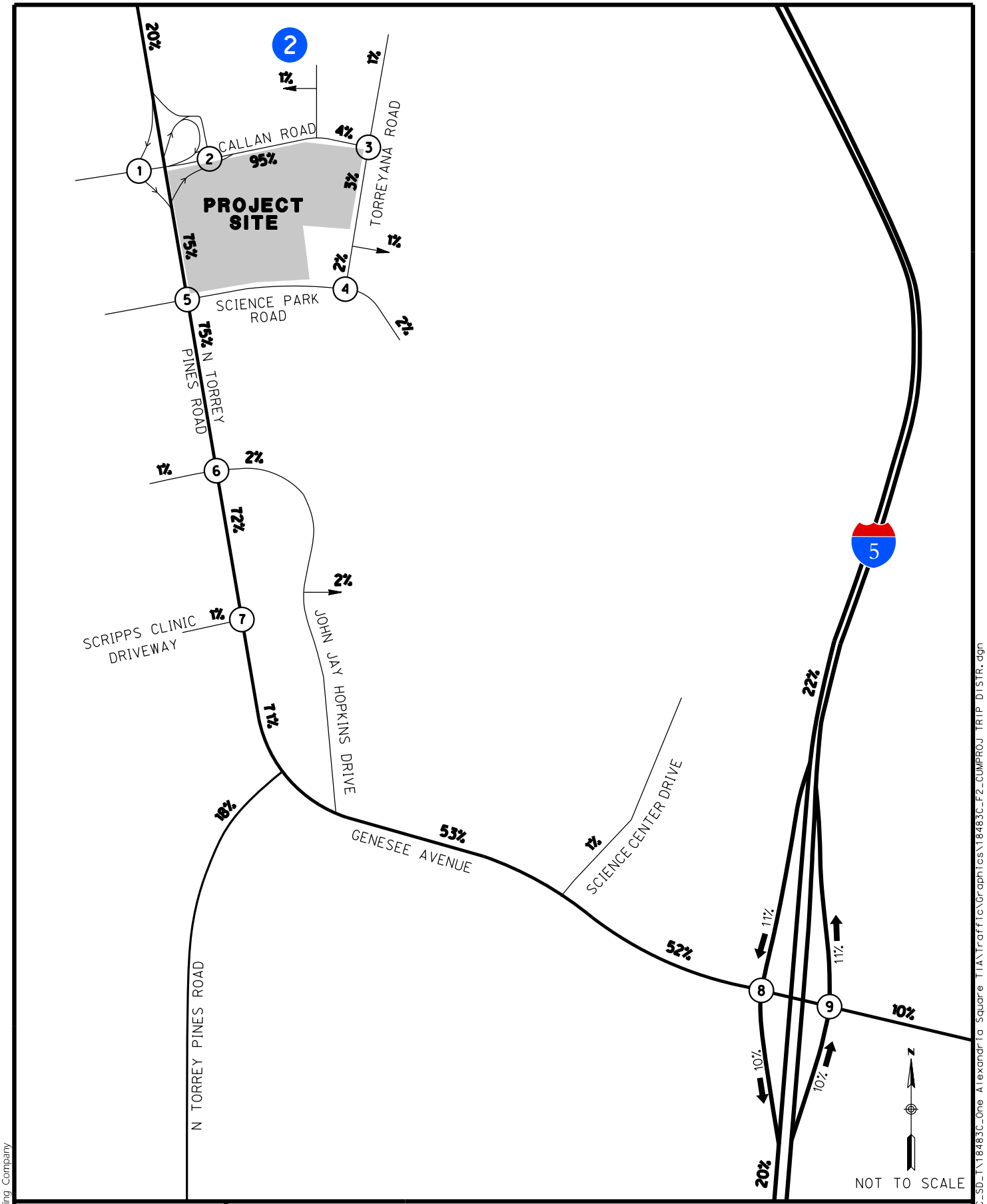
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX F

CUMULATIVE PROJECTS TRIP ASSIGNMENT



RICK ENGINEERING COMPANY

EXHIBIT F-2

HEALTHSPEAK CAMPUS TRIP DISTRIBUTION

ONE ALEXANDRIA SQUARE TRANSPORTATION STUDY

LEGEND

xx% =DISTRIBUTION PERCENTAGE

=CUMULATIVE PROJECT LOCATION

C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\18483C_F2_CUMPROJ TRIP DISTR.dgn
C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\SD CorpStds 2005.dscript
28-JAN-2021 10:10

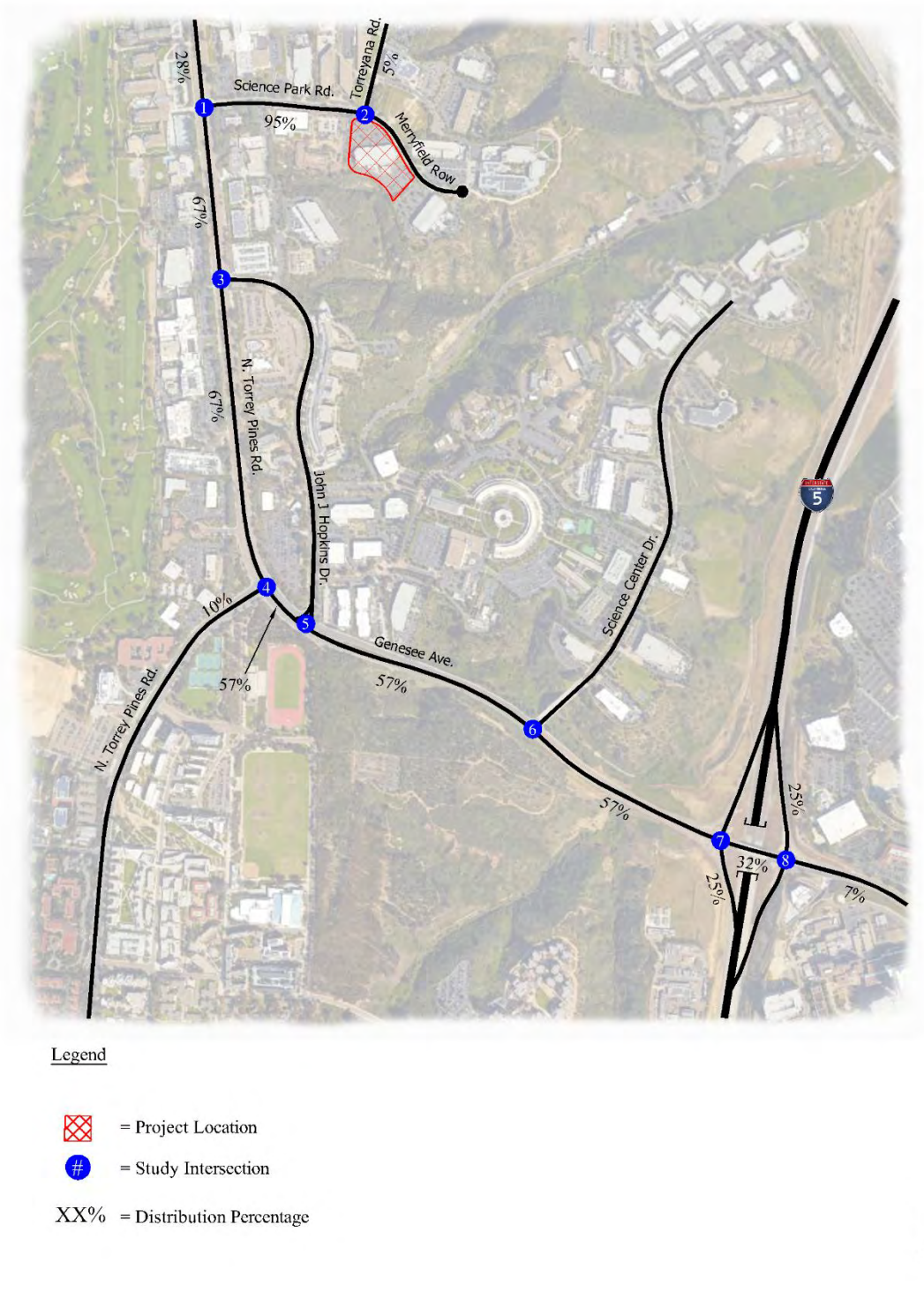
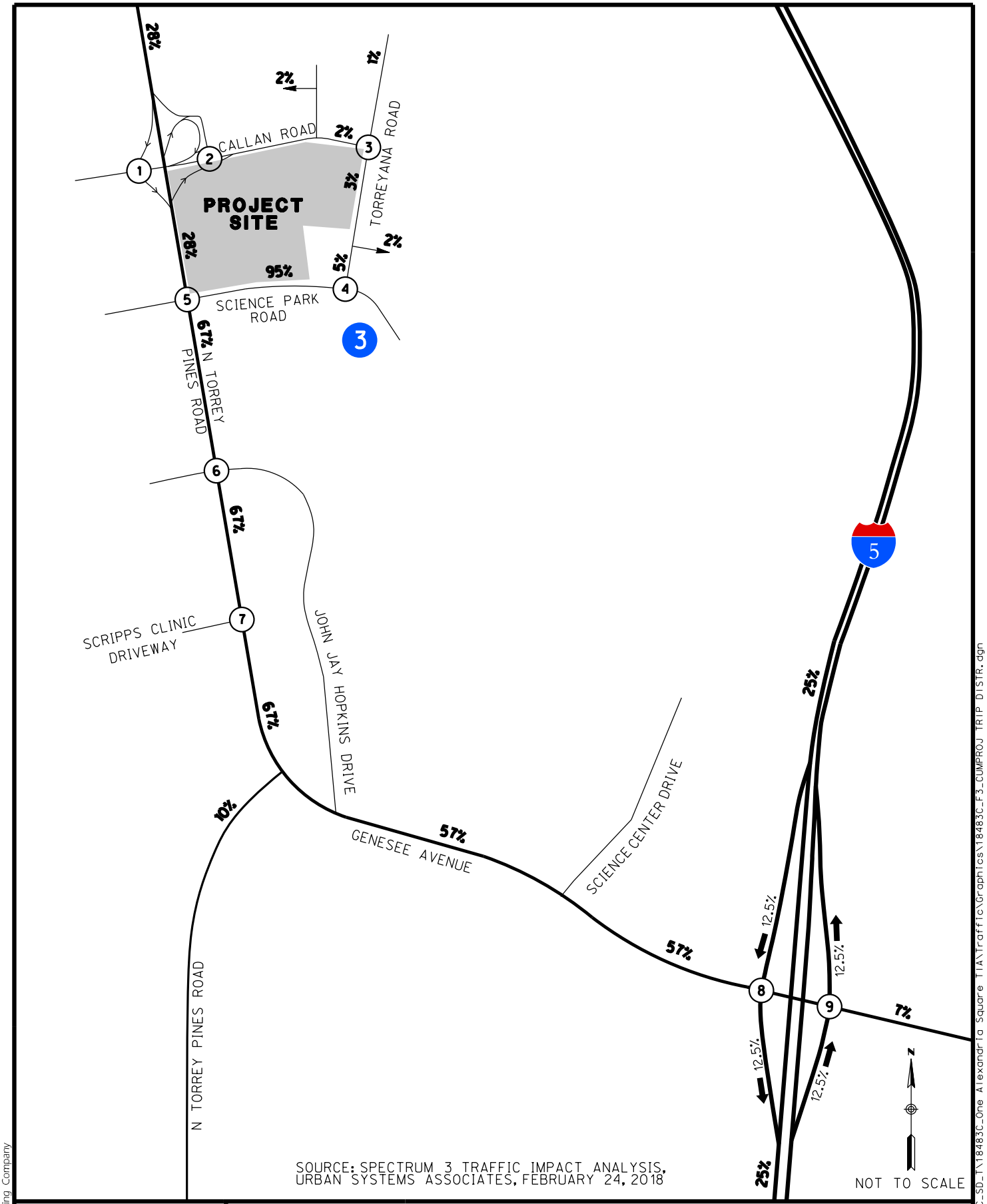


Figure 3-1

Project Distribution Percentages



RICK ENGINEERING COMPANY

EXHIBIT F-3

SPECTRUM III TRIP DISTRIBUTION

ONE ALEXANDRIA SQUARE TRANSPORTATION STUDY

LEGEND

XX% =DISTRIBUTION PERCENTAGE

=CUMULATIVE PROJECT LOCATION

C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\18483C_F3_CUMPROJ TRIP DISTR.dgn
C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\SD CorpStds 2005.dscript
28-JAN-2021 10:09

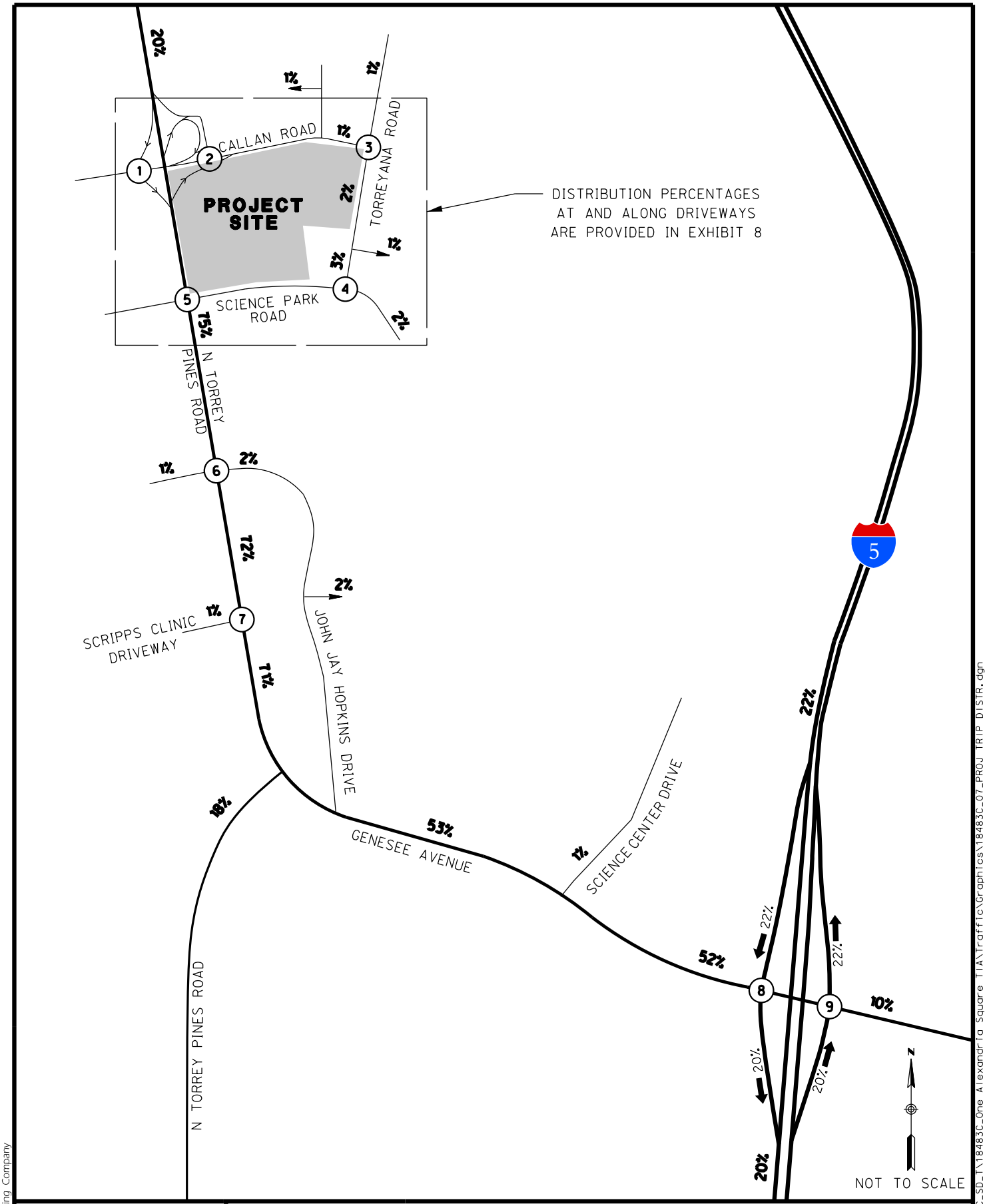


EXHIBIT 7

PROJECT TRIP DISTRIBUTION

ONE ALEXANDRIA SQUARE TRANSPORTATION STUDY

LEGEND: XX% = DISTRIBUTION PERCENTAGE

RICK ENGINEERING COMPANY

C:\RICK\Projects\C_SD_TV\18483C_One Alexandria Square TIA\Traffic\Graphics\18483C_07_PROJ TRIP DISTR.dgn
C:\RICK\Projects\C_SD_TV\18483C_One Alexandria Square TIA\Traffic\Graphics\SD CorpStds 2005.dscript
15-JUN-2021 11:42

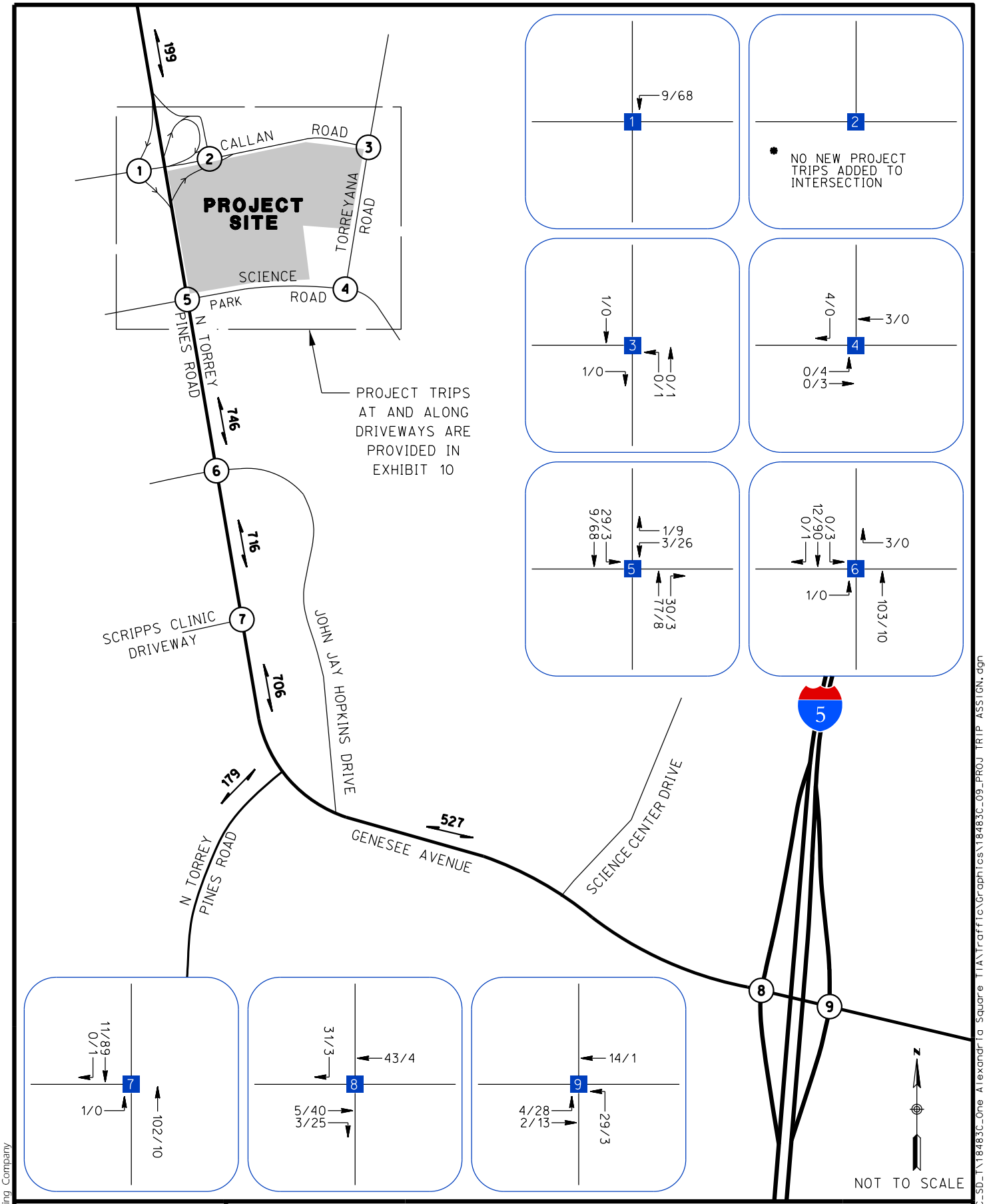


EXHIBIT 9

PROJECT TRIP ASSIGNMENT

LEGEND

AM/PM=PEAK HOUR VOLUMES

XXX =TWO-WAY ADT

RICK ENGINEERING COMPANY

ONE ALEXANDRIA SQUARE TRANSPORTATION STUDY

C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\18483C_09_PROJ TRIP ASSIGN.dgn
C:\RICK\Projects\C_SD_TV18483C_One Alexandria Square TIA\Traffic\Graphics\SD CorpStds 2005.dscript
15-JUN-2021 13:24

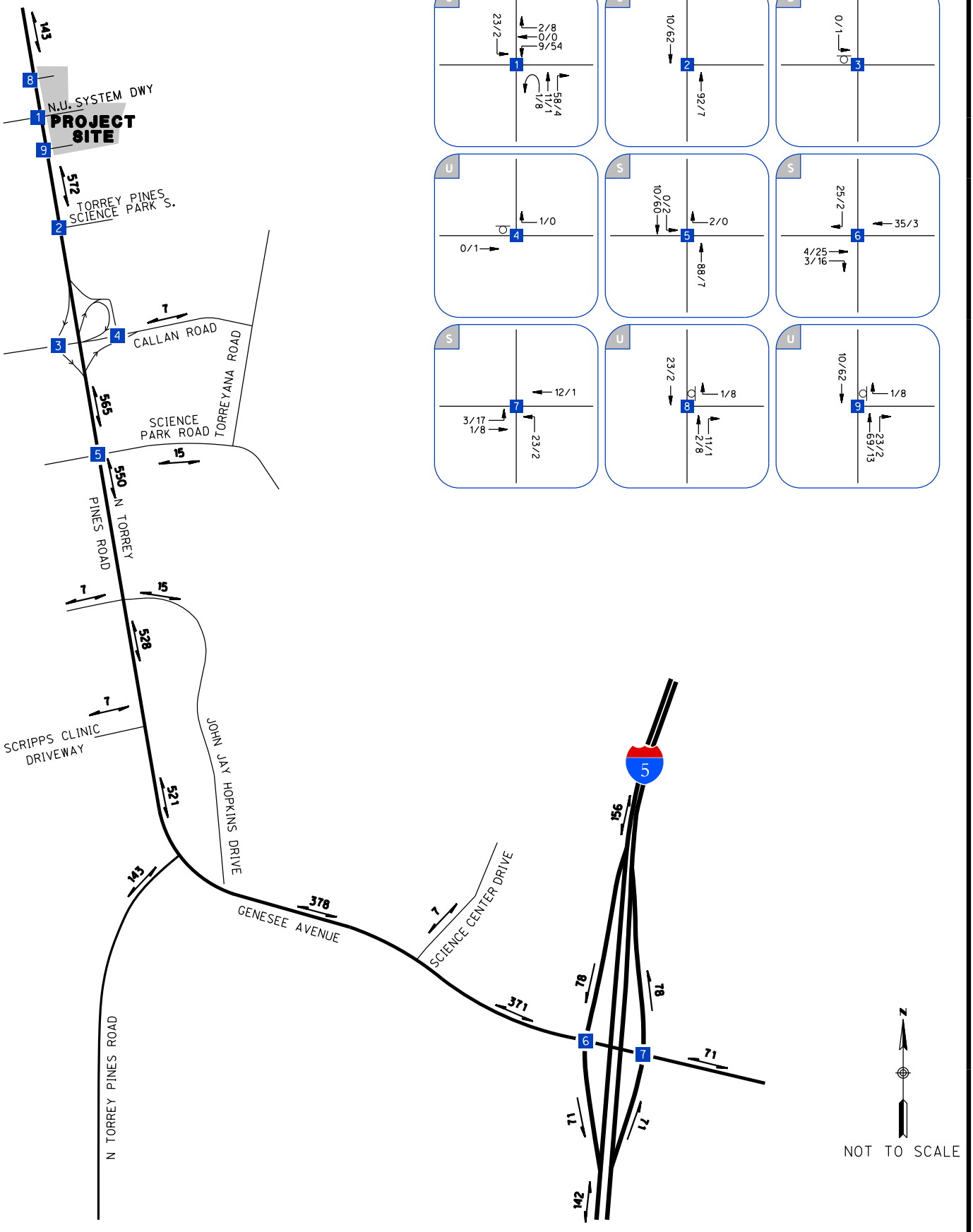


EXHIBIT 7

PROJECT TRIP VOLUMES

ONE ALEXANDRIA NORTH

RICK ENGINEERING COMPANY

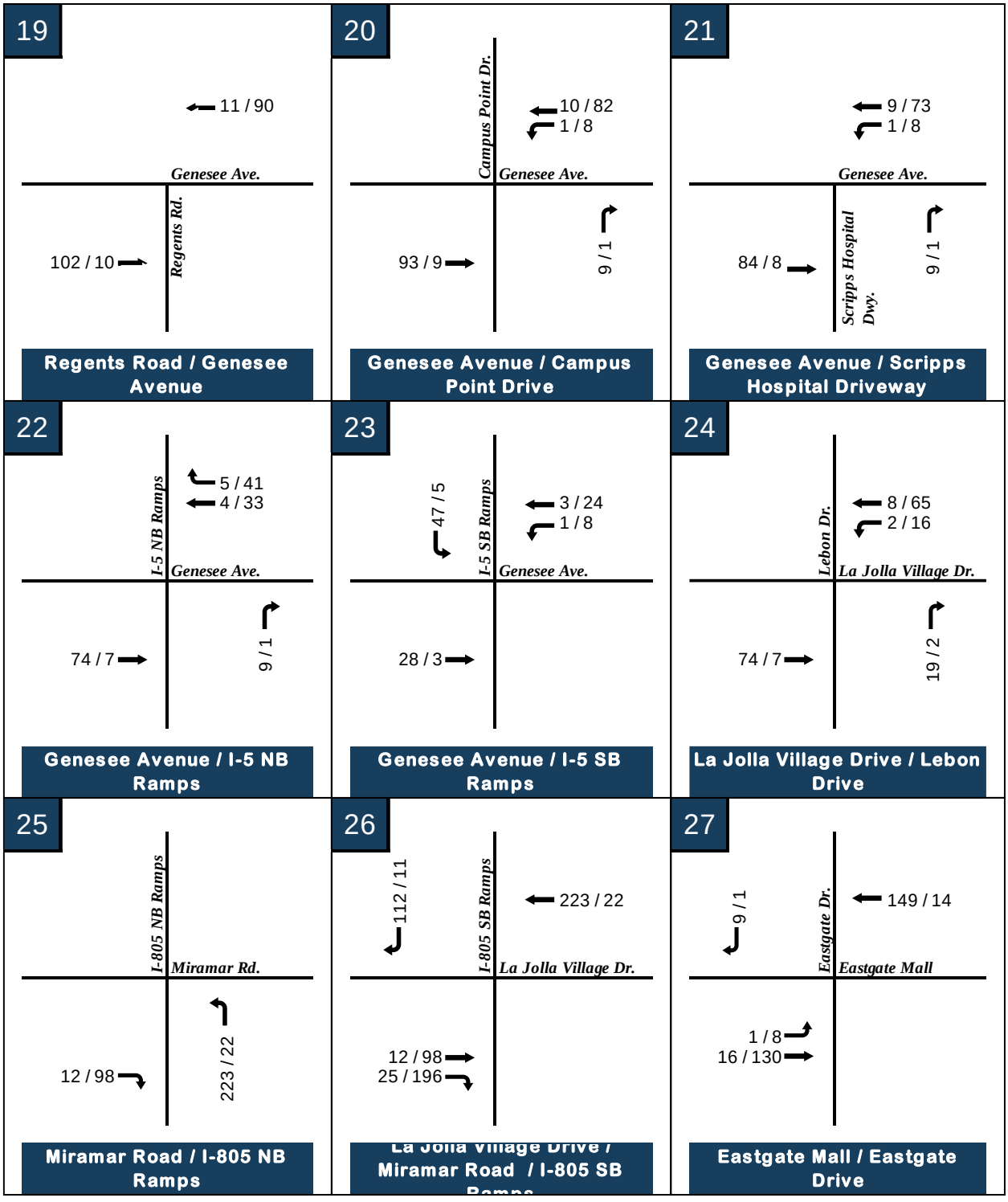
LEGEND

- X =INTERSECTION NUMBER
- S =SIGNALIZED
- U =UNSIGNALIZED
- =STOP CONTROL
- X,XXX = TWO-WAY ADT
- X,XXX = ONE-WAY ADT

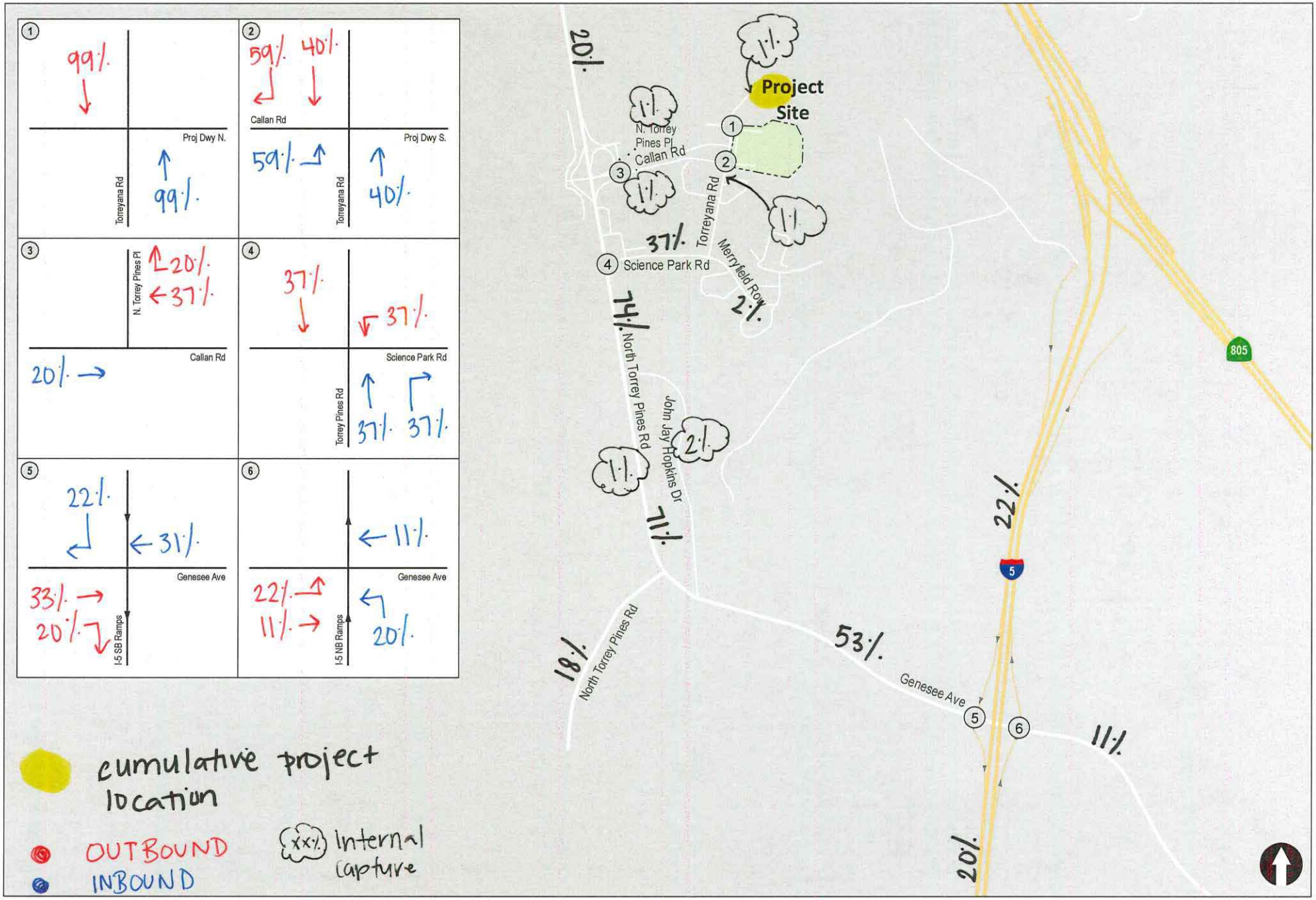
\\cp.rickeng.com\projects\C19000\19366_ARE_OAN\Traffic\Exhibits\19366_07_ProjectTripVolumes.dgn
\\cp.rickeng.com\projects\C19000\19366_ARE_OAN\Traffic\Exhibits\PDFs\2022-0120\SD CorpStds 2005.dscript

21-JAN-2022 11:00

Figure 4-6: Project Only AM / PM Peak Hour Volumes (cont'd)



XX / XX = AM / PM Peak hour volumes



LINSCOTT LAW & GREENSPAN engineers

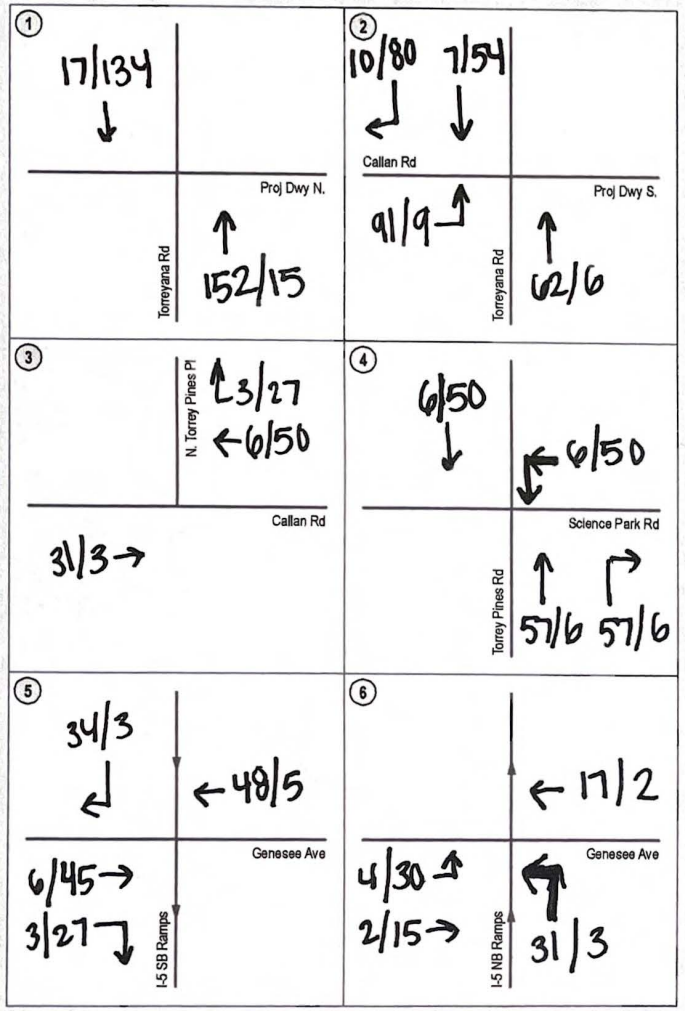
N:\3527\Figures
Date: 4/5/2023
Time: 7:27 AM

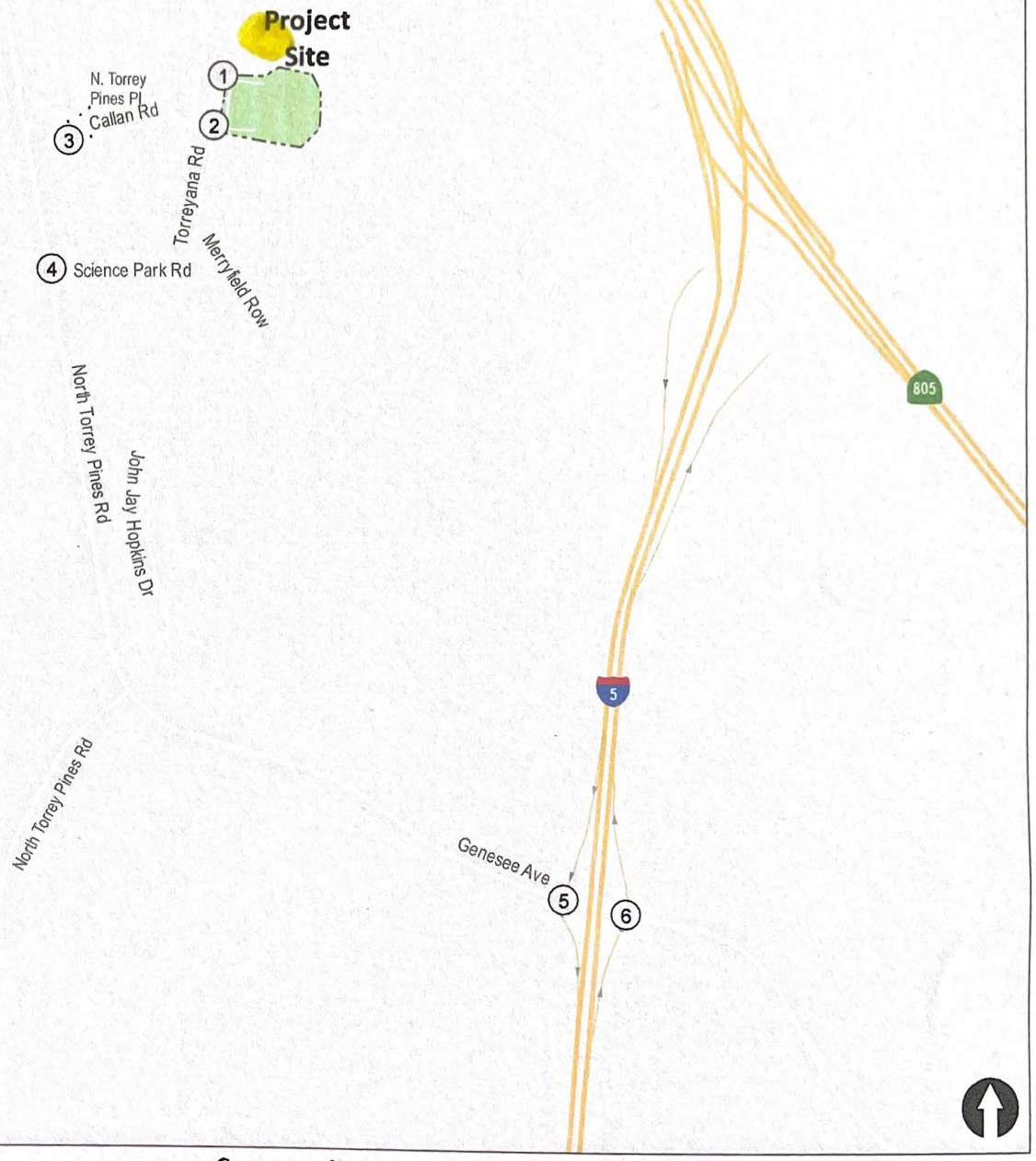
Healthpeak Torreyana Campus

PTS 1056938

Figure

11011 Torreyana Project





LINSCOTT LAW & GREENSPAN engineers

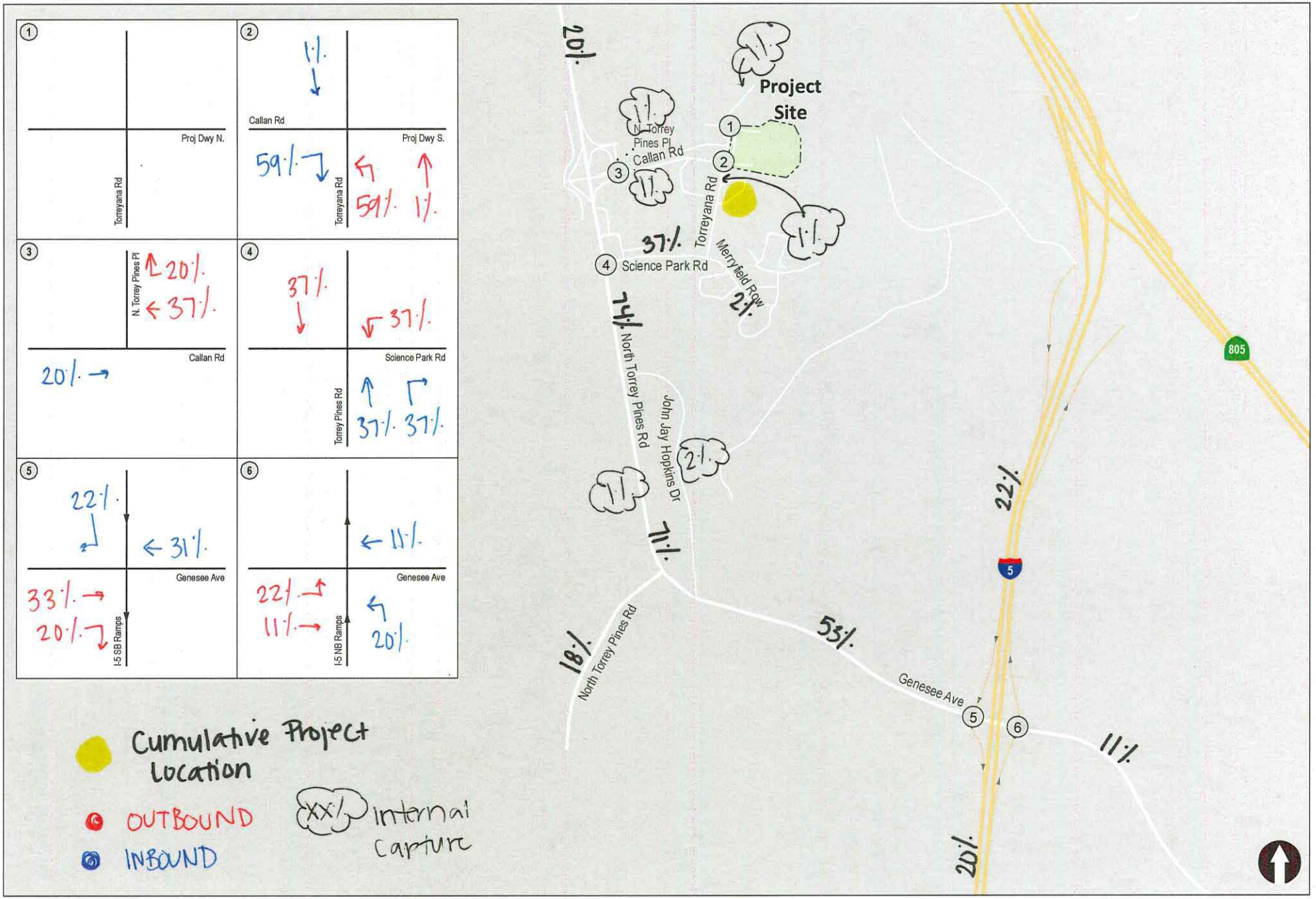
N:\3527\Figures
Date: 4/5/2023
Time: 7:27 AM

Healthpeak Torreyana Campus

PTS 1056938

Figure

11011 Torreyana Project



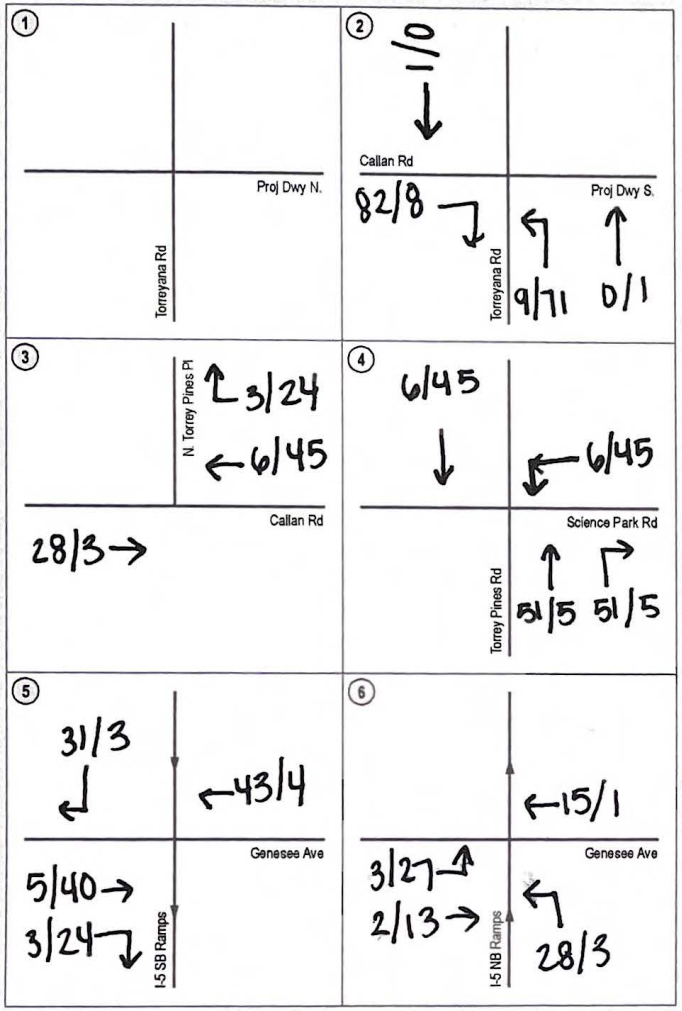
LINSCOTT LAW & GREENSPAN engineers

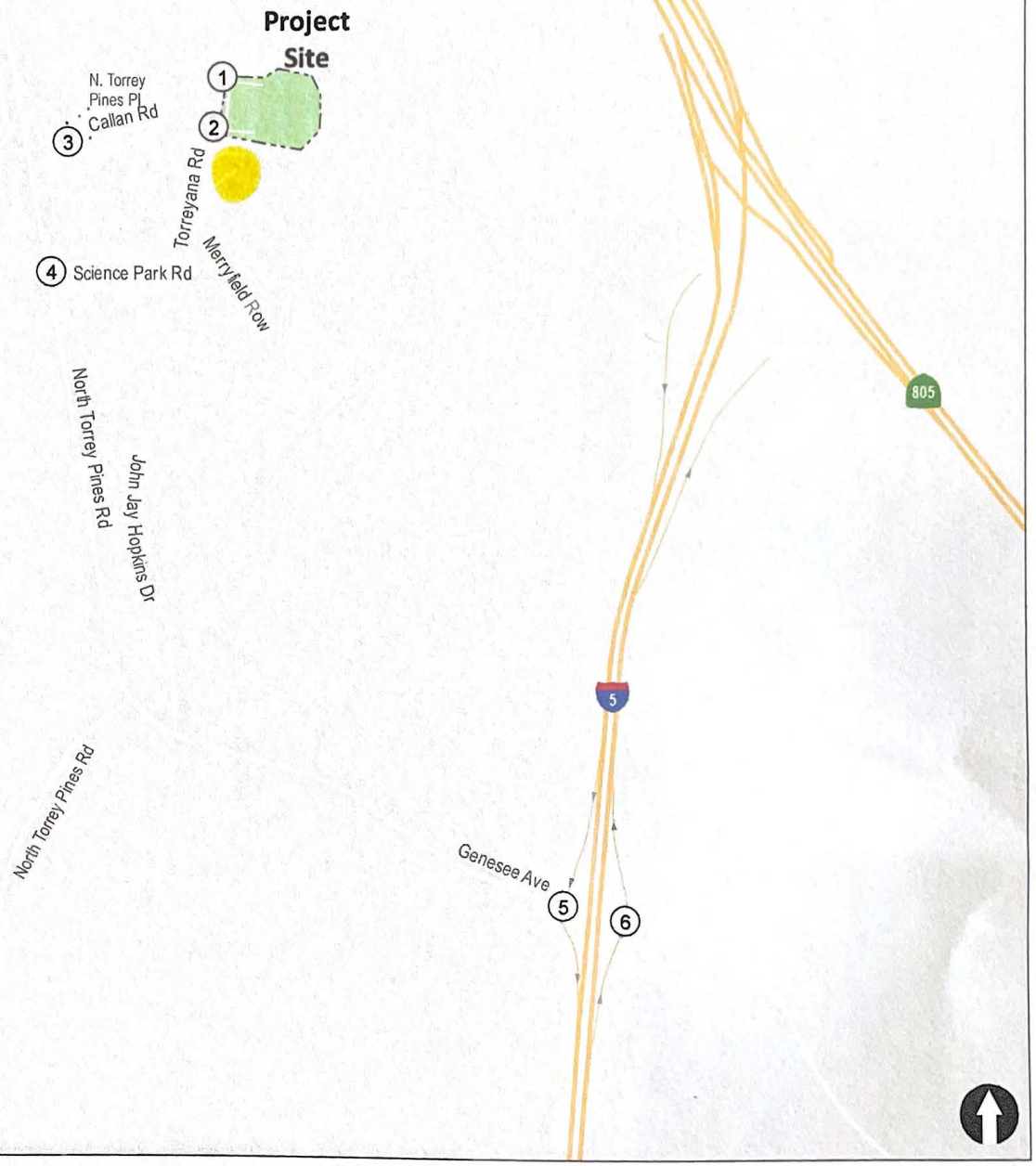
N:\3527\Figures
Date: 4/5/2023
Time: 7:27 AM

One Alexandria Square - 7
PTS 1057530

Figure

11011 Torreyana Project





LINSCOTT LAW & GREENSPAN engineers

N:\3527\Figures
Date: 4/5/2023
Time: 7:27 AM

One Alexandria Square - 7

PTS 1057530

Figure

11011 Torreyana Project

APPENDIX G

OPENING YEAR 2026 INTERSECTION ANALYSIS CALCULATIONS SHEETS

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	1	1	0	0	1	161	22	0	21	0
Future Vol, veh/h	0	0	1	1	0	0	1	161	22	0	21	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	1	0	0	1	175	24	0	23	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	232	244	43	233	232	207	33	0	0	209	0	0
Stage 1	33	33	-	199	199	-	-	-	-	-	-	-
Stage 2	199	211	-	34	33	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	723	658	1027	722	668	833	1579	-	-	1362	-	-
Stage 1	983	868	-	803	736	-	-	-	-	-	-	-
Stage 2	803	728	-	982	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	709	644	1008	707	654	817	1564	-	-	1349	-	-
Mov Cap-2 Maneuver	709	644	-	707	654	-	-	-	-	-	-	-
Stage 1	972	859	-	794	728	-	-	-	-	-	-	-
Stage 2	795	720	-	972	859	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	10.1	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1564	-	-	1008	707	1349	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.002	-	-	-
HCM Control Delay (s)	7.3	0	-	8.6	10.1	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	175	0	175	0	1	0	48	95	0	0	13	15
Future Vol, veh/h	175	0	175	0	1	0	48	95	0	0	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	190	0	190	0	1	0	52	103	0	0	14	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	7.8	9.2	7.9
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	34%	50%	0%	0%
Vol Thru, %	66%	0%	100%	46%
Vol Right, %	0%	50%	0%	54%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	350	1	28
LT Vol	48	175	0	0
Through Vol	95	0	1	13
RT Vol	0	175	0	15
Lane Flow Rate	155	380	1	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.211	0.444	0.001	0.039
Departure Headway (Hd)	4.882	4.199	4.805	4.659
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	735	860	744	767
Service Time	2.914	2.219	2.84	2.698
HCM Lane V/C Ratio	0.211	0.442	0.001	0.039
HCM Control Delay	9.2	10.5	7.8	7.9
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.8	2.3	0	0.1

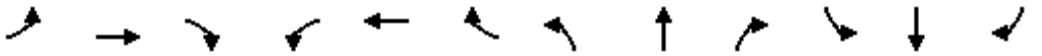
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	230	50	23	3	12
Future Vol, veh/h	22	230	50	23	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	250	54	25	3	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	79	0	-	0	365	67
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1519	-	-	-	635	997
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	753	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1519	-	-	-	624	997
Mov Cap-2 Maneuver	-	-	-	-	624	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1519	-	-	-	891
HCM Lane V/C Ratio	0.016	-	-	-	0.018
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	179	73	13	14	134	793	661	159	656	38
Future Volume (veh/h)	9	4	179	73	13	14	134	793	661	159	656	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.93	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	4	195	89	0	15	146	862	718	173	713	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	48	138	292	0	120	171	2863	857	198	2939	881
Arrive On Green	0.09	0.09	0.09	0.08	0.00	0.08	0.10	0.56	0.56	0.11	0.58	0.58
Sat Flow, veh/h	1290	516	1480	3563	0	1469	1781	5106	1529	1781	5106	1530
Grp Volume(v), veh/h	14	0	195	89	0	15	146	862	718	173	713	41
Grp Sat Flow(s),veh/h/ln	1806	0	1480	1781	0	1469	1781	1702	1529	1781	1702	1530
Q Serve(g_s), s	0.9	0.0	12.1	3.1	0.0	1.2	10.5	11.6	50.6	12.4	9.0	1.5
Cycle Q Clear(g_c), s	0.9	0.0	12.1	3.1	0.0	1.2	10.5	11.6	50.6	12.4	9.0	1.5
Prop In Lane	0.71		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	0	138	292	0	120	171	2863	857	198	2939	881
V/C Ratio(X)	0.08	0.00	1.42	0.30	0.00	0.12	0.85	0.30	0.84	0.87	0.24	0.05
Avail Cap(c_a), veh/h	168	0	138	1041	0	429	258	2863	857	241	2939	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	0.0	59.0	56.2	0.0	55.4	57.8	15.1	23.7	56.9	13.6	12.0
Incr Delay (d2), s/veh	0.1	0.0	224.1	0.2	0.0	0.2	10.6	0.3	9.6	21.7	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	13.1	1.4	0.0	0.5	5.1	4.3	19.0	6.7	3.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	0.0	283.0	56.4	0.0	55.5	68.4	15.4	33.2	78.6	13.8	12.1
LnGrp LOS	D	A	F	E	A	E	E	B	C	E	B	B
Approach Vol, veh/h		209			104			1726			927	
Approach Delay, s/veh		267.7			56.3			27.3			25.8	
Approach LOS		F			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.9	78.6		17.0	16.9	80.5		15.5				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	17.6	42.4		12.1	18.8	41.2		38.0				
Max Q Clear Time (g_c+I1), s	14.4	52.6		14.1	12.5	11.0		5.1				
Green Ext Time (p_c), s	0.1	0.0		0.0	0.1	9.1		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		44.8	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	569	143	182	2138	0	0	0	0	1524	1	1680
Future Volume (veh/h)	0	569	143	182	2138	0	0	0	0	1524	1	1680
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	618	155	198	2324	0				1658	0	1826
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1925	671	265	1930	0				1742	0	1515
Arrive On Green	0.00	0.25	0.25	0.03	0.12	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	7930	2640	3456	5274	0				3563	0	3099
Grp Volume(v), veh/h	0	618	155	198	2324	0				1658	0	1826
Grp Sat Flow(s),veh/h/ln	0	1515	1320	1728	1702	0				1781	0	1549
Q Serve(g_s), s	0.0	6.6	4.7	5.7	37.8	0.0				44.5	0.0	48.9
Cycle Q Clear(g_c), s	0.0	6.6	4.7	5.7	37.8	0.0				44.5	0.0	48.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1925	671	265	1930	0				1742	0	1515
V/C Ratio(X)	0.00	0.32	0.23	0.75	1.20	0.00				0.95	0.00	1.21
Avail Cap(c_a), veh/h	0	1925	671	287	1930	0				1742	0	1515
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.61	0.61	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.3	29.5	47.8	43.8	0.0				24.4	0.0	25.6
Incr Delay (d2), s/veh	0.0	0.4	0.8	5.0	95.1	0.0				12.0	0.0	98.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	1.5	2.6	33.9	0.0				20.4	0.0	37.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.7	30.4	52.8	138.8	0.0				36.4	0.0	124.3
LnGrp LOS	A	C	C	D	F	A				D	A	F
Approach Vol, veh/h		773			2522						3484	
Approach Delay, s/veh		30.6			132.1						82.5	
Approach LOS		C			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.4	32.6		55.0		45.0
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 8.3	24.8		48.9		37.8
Max Q Clear Time (g_c+I1), s	7.7	8.6		50.9		39.8
Green Ext Time (p_c), s	0.0	2.6		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	95.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	1812	0	0	771	609	1473	3	1044	0	0	0
Future Volume (veh/h)	230	1812	0	0	771	609	1473	3	1044	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	250	1970	0	0	838	662	1603	0	1135			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	321	2045	0	0	1937	675	1662	0	1445			
Arrive On Green	0.03	0.13	0.00	0.00	0.26	0.26	0.47	0.00	0.47			
Sat Flow, veh/h	3456	5274	0	0	7930	2641	3563	0	3097			
Grp Volume(v), veh/h	250	1970	0	0	838	662	1603	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1320	1781	0	1549			
Q Serve(g_s), s	7.2	38.4	0.0	0.0	9.3	24.9	43.6	0.0	30.9			
Cycle Q Clear(g_c), s	7.2	38.4	0.0	0.0	9.3	24.9	43.6	0.0	30.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	321	2045	0	0	1937	675	1662	0	1445			
V/C Ratio(X)	0.78	0.96	0.00	0.00	0.43	0.98	0.96	0.00	0.79			
Avail Cap(c_a), veh/h	390	2045	0	0	1937	675	1671	0	1453			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.63	0.63	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.5	42.7	0.0	0.0	31.1	37.0	25.9	0.0	22.5			
Incr Delay (d2), s/veh	4.1	9.3	0.0	0.0	0.7	30.2	14.3	0.0	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.3	19.0	0.0	0.0	3.3	10.4	20.7	0.0	11.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	52.0	0.0	0.0	31.9	67.1	40.2	0.0	25.1			
LnGrp LOS	D	D	A	A	C	E	D	A	C			
Approach Vol, veh/h		2220			1500			2738				
Approach Delay, s/veh		51.9			47.4			33.9				
Approach LOS		D			D			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		47.2			14.5	32.8		52.8				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		39.8			* 11	23.3		46.9				
Max Q Clear Time (g_c+I1), s		40.4			9.2	26.9		45.6				
Green Ext Time (p_c), s		0.0			0.1	0.0		1.0				

Intersection Summary	
HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	1	20	0	0	0	19	1	0	139	0
Future Vol, veh/h	0	0	1	20	0	0	0	19	1	0	139	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	22	0	0	0	21	1	0	151	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	193	193	171	194	193	42	161	0	0	32	0	0
Stage 1	161	161	-	32	32	-	-	-	-	-	-	-
Stage 2	32	32	-	162	161	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	767	702	873	765	702	1029	1418	-	-	1580	-	-
Stage 1	841	765	-	984	868	-	-	-	-	-	-	-
Stage 2	984	868	-	840	765	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	752	688	856	750	688	1009	1404	-	-	1565	-	-
Mov Cap-2 Maneuver	752	688	-	750	688	-	-	-	-	-	-	-
Stage 1	833	757	-	974	859	-	-	-	-	-	-	-
Stage 2	975	859	-	831	757	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.9	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	856	750	1565	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.029	-	-	-
HCM Control Delay (s)	0	-	-	9.2	9.9	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	1	35	0	0	0	161	15	0	0	94	155
Future Vol, veh/h	14	1	35	0	0	0	161	15	0	0	94	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1	38	0	0	0	175	16	0	0	102	168
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	0	8.9	8.5
HCM LOS	A	-	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	28%	0%	0%
Vol Thru, %	9%	2%	100%	38%
Vol Right, %	0%	70%	0%	62%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	176	50	0	249
LT Vol	161	14	0	0
Through Vol	15	1	0	94
RT Vol	0	35	0	155
Lane Flow Rate	191	54	0	271
Geometry Grp	1	1	1	1
Degree of Util (X)	0.235	0.069	0	0.286
Departure Headway (Hd)	4.418	4.539	4.983	3.799
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	803	794	0	928
Service Time	2.5	2.539	2.987	1.898
HCM Lane V/C Ratio	0.238	0.068	0	0.292
HCM Control Delay	8.9	7.9	8	8.5
HCM Lane LOS	A	A	N	A
HCM 95th-tile Q	0.9	0.2	0	1.2

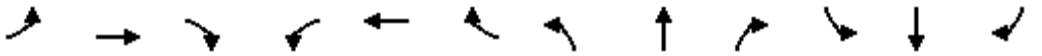
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	19	349	196	2	56
Future Vol, veh/h	58	19	349	196	2	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	21	379	213	2	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	592	0	-	0	633	486
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	147	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	984	-	-	-	444	581
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	984	-	-	-	415	581
Mov Cap-2 Maneuver	-	-	-	-	415	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	984	-	-	-	573
HCM Lane V/C Ratio	0.064	-	-	-	0.11
HCM Control Delay (s)	8.9	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	7	79	590	4	125	186	951	100	13	801	13
Future Volume (veh/h)	22	7	79	590	4	125	186	951	100	13	801	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.96	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	8	86	644	0	136	202	1034	109	14	871	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	33	107	770	0	330	226	2785	834	22	2199	655
Arrive On Green	0.07	0.07	0.07	0.22	0.00	0.22	0.13	0.55	0.55	0.01	0.43	0.43
Sat Flow, veh/h	1352	451	1457	3563	0	1529	1781	5106	1528	1781	5106	1522
Grp Volume(v), veh/h	32	0	86	644	0	136	202	1034	109	14	871	14
Grp Sat Flow(s),veh/h/ln	1803	0	1457	1781	0	1529	1781	1702	1528	1781	1702	1522
Q Serve(g_s), s	2.2	0.0	7.6	22.5	0.0	10.0	14.5	15.0	4.5	1.0	15.2	0.7
Cycle Q Clear(g_c), s	2.2	0.0	7.6	22.5	0.0	10.0	14.5	15.0	4.5	1.0	15.2	0.7
Prop In Lane	0.75		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	0	107	770	0	330	226	2785	834	22	2199	655
V/C Ratio(X)	0.24	0.00	0.81	0.84	0.00	0.41	0.89	0.37	0.13	0.64	0.40	0.02
Avail Cap(c_a), veh/h	196	0	158	1318	0	566	227	2785	834	77	2199	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	0.0	59.3	48.8	0.0	43.8	55.9	16.8	14.5	63.9	25.4	21.3
Incr Delay (d2), s/veh	0.4	0.0	10.2	0.9	0.0	0.3	31.8	0.4	0.3	11.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.1	10.2	0.0	3.9	8.4	5.6	1.6	0.5	6.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	0.0	69.5	49.7	0.0	44.1	87.7	17.2	14.8	75.1	25.9	21.3
LnGrp LOS	E	A	E	D	A	D	F	B	B	E	C	C
Approach Vol, veh/h		118			780			1345			899	
Approach Delay, s/veh		66.2			48.7			27.6			26.6	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	76.6		14.4	20.9	61.7		33.0				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	5.6	42.3		14.1	16.6	31.3		48.1				
Max Q Clear Time (g_c+I1), s	3.0	17.0		9.6	16.5	17.2		24.5				
Green Ext Time (p_c), s	0.0	14.2		0.1	0.0	7.3		1.6				

Intersection Summary			
HCM 6th Ctrl Delay		34.0	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2116	985	416	779	0	0	0	0	411	2	369
Future Volume (veh/h)	0	2116	985	416	779	0	0	0	0	411	2	369
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	2300	1071	452	847	0				448	0	401
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	3846	1364	517	3596	0				580	0	494
Arrive On Green	0.00	0.51	0.51	0.30	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	7930	2687	3456	5274	0				3563	0	3033
Grp Volume(v), veh/h	0	2300	1071	452	847	0				448	0	401
Grp Sat Flow(s),veh/h/ln	0	1515	1343	1728	1702	0				1781	0	1516
Q Serve(g_s), s	0.0	21.5	32.6	12.4	0.0	0.0				12.0	0.0	12.8
Cycle Q Clear(g_c), s	0.0	21.5	32.6	12.4	0.0	0.0				12.0	0.0	12.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3846	1364	517	3596	0				580	0	494
V/C Ratio(X)	0.00	0.60	0.79	0.87	0.24	0.00				0.77	0.00	0.81
Avail Cap(c_a), veh/h	0	3846	1364	736	3596	0				851	0	725
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.90	0.90	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.4	20.1	34.2	0.0	0.0				40.1	0.0	40.4
Incr Delay (d2), s/veh	0.0	0.7	4.6	5.8	0.1	0.0				1.3	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	9.7	4.6	0.0	0.0				5.3	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.1	24.7	39.9	0.1	0.0				41.4	0.0	43.1
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		3371			1299						849	
Approach Delay, s/veh		20.2			14.0						42.2	
Approach LOS		C			B						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.7	58.0		22.4		77.6
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 21	36.8		23.9		62.8
Max Q Clear Time (g_c+I1), s	14.4	34.6		14.8		2.0
Green Ext Time (p_c), s	0.5	2.0		1.5		3.7

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1439	1092	0	0	863	1522	331	3	194	0	0	0
Future Volume (veh/h)	1439	1092	0	0	863	1522	331	3	194	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.93			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	1564	1187	0	0	938	1545	362	0	211			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	1030	3973	0	0	3242	1146	317	0	263			
Arrive On Green	0.50	1.00	0.00	0.00	0.43	0.43	0.09	0.00	0.09			
Sat Flow, veh/h	3456	5274	0	0	7930	2678	3563	0	2953			
Grp Volume(v), veh/h	1564	1187	0	0	938	1545	362	0	211			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1339	1781	0	1476			
Q Serve(g_s), s	29.8	0.0	0.0	0.0	8.1	42.8	8.9	0.0	7.0			
Cycle Q Clear(g_c), s	29.8	0.0	0.0	0.0	8.1	42.8	8.9	0.0	7.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1030	3973	0	0	3242	1146	317	0	263			
V/C Ratio(X)	1.52	0.30	0.00	0.00	0.29	1.35	1.14	0.00	0.80			
Avail Cap(c_a), veh/h	1030	3973	0	0	3242	1146	317	0	263			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.69	0.69	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.1	0.0	0.0	0.0	18.7	28.6	45.5	0.0	44.7			
Incr Delay (d2), s/veh	236.9	0.1	0.0	0.0	0.2	162.4	94.6	0.0	15.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	41.7	0.0	0.0	0.0	2.7	38.2	8.1	0.0	3.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	262.0	0.1	0.0	0.0	18.9	191.0	140.1	0.0	59.9			
LnGrp LOS	F	A	A	A	B	F	F	A	E			
Approach Vol, veh/h		2751			2483			573				
Approach Delay, s/veh		149.0			126.0			110.6				
Approach LOS		F			F			F				

Timer - Assigned Phs	2		5	6		8
Phs Duration (G+Y+Rc), s	85.0		35.0	50.0		15.0
Change Period (Y+Rc), s	7.2		* 5.2	7.2		6.1
Max Green Setting (Gmax), s	77.8		* 30	42.8		8.9
Max Q Clear Time (g_c+I1), s	2.0		31.8	44.8		10.9
Green Ext Time (p_c), s	5.7		0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	135.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX H

OPENING YEAR 2026 + PROJECT INTERSECTION ANALYSIS CALCULATION SHEETS

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	15	0	0	1	161	137	1	21	0
Future Vol, veh/h	0	0	1	15	0	0	1	161	137	1	21	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	16	0	0	1	175	149	1	23	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	297	371	43	298	297	270	33	0	0	334	0	0
Stage 1	35	35	-	262	262	-	-	-	-	-	-	-
Stage 2	262	336	-	36	35	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	655	559	1027	654	615	769	1579	-	-	1225	-	-
Stage 1	981	866	-	743	691	-	-	-	-	-	-	-
Stage 2	743	642	-	980	866	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	642	547	1008	640	601	754	1564	-	-	1213	-	-
Mov Cap-2 Maneuver	642	547	-	640	601	-	-	-	-	-	-	-
Stage 1	970	856	-	735	683	-	-	-	-	-	-	-
Stage 2	735	635	-	969	856	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	10.8	0	0.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1564	-	-	1008	640	1213	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.025	0.001	-	-
HCM Control Delay (s)	7.3	0	-	8.6	10.8	8	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	254	8	175	0	2	0	48	153	0	0	19	24
Future Vol, veh/h	254	8	175	0	2	0	48	153	0	0	19	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	276	9	190	0	2	0	52	166	0	0	21	26
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.9	8.3	10.6	8.5
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	24%	58%	0%	0%
Vol Thru, %	76%	2%	100%	44%
Vol Right, %	0%	40%	0%	56%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	437	2	43
LT Vol	48	254	0	0
Through Vol	153	8	2	19
RT Vol	0	175	0	24
Lane Flow Rate	218	475	2	47
Geometry Grp	1	1	1	1
Degree of Util (X)	0.313	0.593	0.003	0.065
Departure Headway (Hd)	5.156	4.496	5.184	5.022
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	693	798	684	706
Service Time	3.221	2.539	3.264	3.104
HCM Lane V/C Ratio	0.315	0.595	0.003	0.067
HCM Control Delay	10.6	13.9	8.3	8.5
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	1.3	4	0	0.2

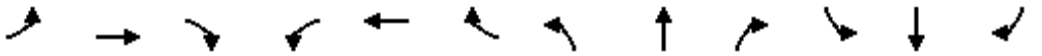
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	259	56	26	3	12
Future Vol, veh/h	22	259	56	26	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	282	61	28	3	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	89	0	-	0	405	75
Stage 1	-	-	-	-	75	-
Stage 2	-	-	-	-	330	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1506	-	-	-	602	986
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1506	-	-	-	591	986
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1506	-	-	-	870
HCM Lane V/C Ratio	0.016	-	-	-	0.019
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	179	79	13	14	134	847	715	159	662	38
Future Volume (veh/h)	9	4	179	79	13	14	134	847	715	159	662	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.93	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	10	4	195	96	0	15	146	921	777	173	720	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	110	44	126	298	0	123	171	2894	867	198	2970	890
Arrive On Green	0.09	0.09	0.09	0.08	0.00	0.08	0.10	0.57	0.57	0.11	0.58	0.58
Sat Flow, veh/h	1290	516	1473	3563	0	1471	1781	5106	1529	1781	5106	1530
Grp Volume(v), veh/h	14	0	195	96	0	15	146	921	777	173	720	41
Grp Sat Flow(s),veh/h/ln	1806	0	1473	1781	0	1471	1781	1702	1529	1781	1702	1530
Q Serve(g_s), s	0.9	0.0	11.1	3.3	0.0	1.2	10.5	12.4	58.2	12.4	8.9	1.5
Cycle Q Clear(g_c), s	0.9	0.0	11.1	3.3	0.0	1.2	10.5	12.4	58.2	12.4	8.9	1.5
Prop In Lane	0.71		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	154	0	126	298	0	123	171	2894	867	198	2970	890
V/C Ratio(X)	0.09	0.00	1.55	0.32	0.00	0.12	0.85	0.32	0.90	0.87	0.24	0.05
Avail Cap(c_a), veh/h	154	0	126	1041	0	430	258	2894	867	227	2970	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	0.0	59.4	56.1	0.0	55.1	57.8	14.9	24.8	56.9	13.2	11.7
Incr Delay (d2), s/veh	0.1	0.0	283.2	0.2	0.0	0.2	10.6	0.3	13.9	24.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	14.1	1.5	0.0	0.5	5.1	4.6	22.5	6.8	3.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.9	0.0	342.6	56.3	0.0	55.3	68.4	15.2	38.7	81.5	13.4	11.8
LnGrp LOS	D	A	F	E	A	E	E	B	D	F	B	B
Approach Vol, veh/h		209			111			1844			934	
Approach Delay, s/veh		323.3			56.2			29.3			26.0	
Approach LOS		F			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.8	79.4		16.0	16.9	81.3		15.8				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	16.6	44.4		11.1	18.8	42.2		38.0				
Max Q Clear Time (g_c+I1), s	14.4	60.2		13.1	12.5	10.9		5.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	9.4		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		49.1	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	574	146	182	2183	0	0	0	0	1524	1	1712
Future Volume (veh/h)	0	574	146	182	2183	0	0	0	0	1524	1	1712
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	624	159	198	2373	0				1658	0	1861
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1925	671	265	1930	0				1742	0	1515
Arrive On Green	0.00	0.25	0.25	0.03	0.12	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	7930	2640	3456	5274	0				3563	0	3099
Grp Volume(v), veh/h	0	624	159	198	2373	0				1658	0	1861
Grp Sat Flow(s),veh/h/ln	0	1515	1320	1728	1702	0				1781	0	1549
Q Serve(g_s), s	0.0	6.7	4.8	5.7	37.8	0.0				44.5	0.0	48.9
Cycle Q Clear(g_c), s	0.0	6.7	4.8	5.7	37.8	0.0				44.5	0.0	48.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1925	671	265	1930	0				1742	0	1515
V/C Ratio(X)	0.00	0.32	0.24	0.75	1.23	0.00				0.95	0.00	1.23
Avail Cap(c_a), veh/h	0	1925	671	287	1930	0				1742	0	1515
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.58	0.58	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.3	29.6	47.8	43.8	0.0				24.4	0.0	25.6
Incr Delay (d2), s/veh	0.0	0.4	0.8	4.8	106.1	0.0				12.0	0.0	108.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	1.5	2.6	35.9	0.0				20.4	0.0	39.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.8	30.4	52.5	149.8	0.0				36.4	0.0	134.3
LnGrp LOS	A	C	C	D	F	A				D	A	F
Approach Vol, veh/h		783			2571						3519	
Approach Delay, s/veh		30.7			142.4						88.1	
Approach LOS		C			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.4	32.6		55.0		45.0
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 8.3	24.8		48.9		37.8
Max Q Clear Time (g_c+I1), s	7.7	8.7		50.9		39.8
Green Ext Time (p_c), s	0.0	2.6		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	101.9
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	1814	0	0	787	609	1502	3	1044	0	0	0
Future Volume (veh/h)	234	1814	0	0	787	609	1502	3	1044	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	254	1972	0	0	855	662	1635	0	1135			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	324	2032	0	0	1910	665	1671	0	1453			
Arrive On Green	0.03	0.13	0.00	0.00	0.25	0.25	0.47	0.00	0.47			
Sat Flow, veh/h	3456	5274	0	0	7930	2640	3563	0	3097			
Grp Volume(v), veh/h	254	1972	0	0	855	662	1635	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1320	1781	0	1549			
Q Serve(g_s), s	7.3	38.4	0.0	0.0	9.5	25.0	45.0	0.0	30.7			
Cycle Q Clear(g_c), s	7.3	38.4	0.0	0.0	9.5	25.0	45.0	0.0	30.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	324	2032	0	0	1910	665	1671	0	1453			
V/C Ratio(X)	0.78	0.97	0.00	0.00	0.45	0.99	0.98	0.00	0.78			
Avail Cap(c_a), veh/h	390	2032	0	0	1910	665	1671	0	1453			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.63	0.63	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.4	42.8	0.0	0.0	31.5	37.3	26.1	0.0	22.3			
Incr Delay (d2), s/veh	4.3	10.3	0.0	0.0	0.8	33.7	17.1	0.0	2.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.3	19.1	0.0	0.0	3.4	10.7	21.9	0.0	11.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.7	53.2	0.0	0.0	32.3	71.0	43.1	0.0	24.8			
LnGrp LOS	D	D	A	A	C	E	D	A	C			
Approach Vol, veh/h		2226			1517			2770				
Approach Delay, s/veh		53.0			49.2			35.6				
Approach LOS		D			D			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		47.0			14.6	32.4		53.0				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		39.8			* 11	23.3		46.9				
Max Q Clear Time (g_c+I1), s		40.4			9.3	27.0		47.0				
Green Ext Time (p_c), s		0.0			0.1	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	44.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	120	0	1	0	19	13	0	139	0
Future Vol, veh/h	0	0	1	120	0	1	0	19	13	0	139	0
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	130	0	1	0	21	14	0	151	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	200	206	171	200	199	48	161	0	0	45	0	0
Stage 1	161	161	-	38	38	-	-	-	-	-	-	-
Stage 2	39	45	-	162	161	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	759	691	873	759	697	1021	1418	-	-	1563	-	-
Stage 1	841	765	-	977	863	-	-	-	-	-	-	-
Stage 2	976	857	-	840	765	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	744	677	856	744	683	1002	1404	-	-	1548	-	-
Mov Cap-2 Maneuver	744	677	-	744	683	-	-	-	-	-	-	-
Stage 1	833	757	-	967	854	-	-	-	-	-	-	-
Stage 2	966	848	-	831	757	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	10.9	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	856	746	1548	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.176	-	-	-
HCM Control Delay (s)	0	-	-	9.2	10.9	0	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.6	0	-	-

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	2	35	0	7	0	161	20	0	0	145	224
Future Vol, veh/h	22	2	35	0	7	0	161	20	0	0	145	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	2	38	0	8	0	175	22	0	0	158	243
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.4	9.3	10.1
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	89%	37%	0%	0%
Vol Thru, %	11%	3%	100%	39%
Vol Right, %	0%	59%	0%	61%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	59	7	369
LT Vol	161	22	0	0
Through Vol	20	2	7	145
RT Vol	0	35	0	224
Lane Flow Rate	197	64	8	401
Geometry Grp	1	1	1	1
Degree of Util (X)	0.255	0.088	0.011	0.442
Departure Headway (Hd)	4.671	4.915	5.288	3.969
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	769	728	675	910
Service Time	2.694	2.952	3.332	1.985
HCM Lane V/C Ratio	0.256	0.088	0.012	0.441
HCM Control Delay	9.3	8.4	8.4	10.1
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1	0.3	0	2.3

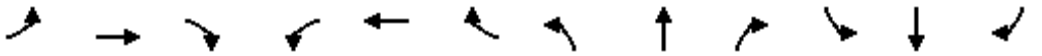
Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	22	396	222	2	56
Future Vol, veh/h	58	22	396	222	2	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	24	430	241	2	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	671	0	-	0	701	551
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	919	-	-	-	405	534
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	878	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	919	-	-	-	377	534
Mov Cap-2 Maneuver	-	-	-	-	377	-
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	878	-

Approach	EB	WB	SB
HCM Control Delay, s	6.7	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	526
HCM Lane V/C Ratio	0.069	-	-	-	0.12
HCM Control Delay (s)	9.2	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	7	79	637	4	125	186	956	105	13	848	13
Future Volume (veh/h)	22	7	79	637	4	125	186	956	105	13	848	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.97	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	8	86	695	0	136	202	1039	114	14	922	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	33	107	814	0	350	226	2722	814	22	2136	636
Arrive On Green	0.07	0.07	0.07	0.23	0.00	0.23	0.13	0.53	0.53	0.01	0.42	0.42
Sat Flow, veh/h	1352	451	1457	3563	0	1531	1781	5106	1528	1781	5106	1521
Grp Volume(v), veh/h	32	0	86	695	0	136	202	1039	114	14	922	14
Grp Sat Flow(s),veh/h/ln	1803	0	1457	1781	0	1531	1781	1702	1528	1781	1702	1521
Q Serve(g_s), s	2.2	0.0	7.6	24.3	0.0	9.8	14.5	15.5	4.9	1.0	16.7	0.7
Cycle Q Clear(g_c), s	2.2	0.0	7.6	24.3	0.0	9.8	14.5	15.5	4.9	1.0	16.7	0.7
Prop In Lane	0.75		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	0	107	814	0	350	226	2722	814	22	2136	636
V/C Ratio(X)	0.24	0.00	0.81	0.85	0.00	0.39	0.89	0.38	0.14	0.64	0.43	0.02
Avail Cap(c_a), veh/h	196	0	158	1318	0	566	227	2722	814	77	2136	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.8	0.0	59.3	48.1	0.0	42.5	55.9	17.8	15.3	63.9	26.8	22.2
Incr Delay (d2), s/veh	0.4	0.0	10.2	1.6	0.0	0.3	31.8	0.4	0.4	11.2	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.1	11.1	0.0	3.8	8.4	5.9	1.7	0.5	6.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	0.0	69.5	49.7	0.0	42.7	87.7	18.2	15.7	75.1	27.5	22.3
LnGrp LOS	E	A	E	D	A	D	F	B	B	E	C	C
Approach Vol, veh/h		118			831			1355			950	
Approach Delay, s/veh		66.2			48.6			28.3			28.1	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	75.0		14.4	20.9	60.1		34.6				
Change Period (Y+Rc), s	4.4	5.7		4.9	4.4	5.7		4.9				
Max Green Setting (Gmax), s	5.6	42.3		14.1	16.6	31.3		48.1				
Max Q Clear Time (g_c+I1), s	3.0	17.5		9.6	16.5	18.7		26.3				
Green Ext Time (p_c), s	0.0	14.2		0.1	0.0	7.1		1.7				

Intersection Summary			
HCM 6th Ctrl Delay		34.8	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2158	1011	416	783	0	0	0	0	411	2	372
Future Volume (veh/h)	0	2158	1011	416	783	0	0	0	0	411	2	372
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	2346	1099	452	851	0				448	0	404
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	3839	1362	517	3591	0				583	0	497
Arrive On Green	0.00	0.51	0.51	0.30	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	7930	2687	3456	5274	0				3563	0	3033
Grp Volume(v), veh/h	0	2346	1099	452	851	0				448	0	404
Grp Sat Flow(s),veh/h/ln	0	1515	1343	1728	1702	0				1781	0	1517
Q Serve(g_s), s	0.0	22.1	34.1	12.4	0.0	0.0				12.0	0.0	12.8
Cycle Q Clear(g_c), s	0.0	22.1	34.1	12.4	0.0	0.0				12.0	0.0	12.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3839	1362	517	3591	0				583	0	497
V/C Ratio(X)	0.00	0.61	0.81	0.87	0.24	0.00				0.77	0.00	0.81
Avail Cap(c_a), veh/h	0	3839	1362	736	3591	0				851	0	725
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.90	0.90	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.6	20.6	34.2	0.0	0.0				40.0	0.0	40.3
Incr Delay (d2), s/veh	0.0	0.7	5.2	5.8	0.1	0.0				1.3	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.9	10.2	4.6	0.0	0.0				5.3	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.4	25.8	39.9	0.1	0.0				41.3	0.0	43.2
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		3445			1303						852	
Approach Delay, s/veh		20.7			13.9						42.2	
Approach LOS		C			B						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.7	57.9		22.5		77.5
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2
Max Green Setting (Gmax), s	* 21	36.8		23.9		62.8
Max Q Clear Time (g_c+I1), s	14.4	36.1		14.8		2.0
Green Ext Time (p_c), s	0.5	0.6		1.5		3.7

Intersection Summary	
HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1467	1106	0	0	865	1522	334	3	194	0	0	0
Future Volume (veh/h)	1467	1106	0	0	865	1522	334	3	194	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.93			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	1595	1202	0	0	940	1545	365	0	211			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	1030	3973	0	0	3242	1146	317	0	263			
Arrive On Green	0.50	1.00	0.00	0.00	0.43	0.43	0.09	0.00	0.09			
Sat Flow, veh/h	3456	5274	0	0	7930	2678	3563	0	2953			
Grp Volume(v), veh/h	1595	1202	0	0	940	1545	365	0	211			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1339	1781	0	1476			
Q Serve(g_s), s	29.8	0.0	0.0	0.0	8.1	42.8	8.9	0.0	7.0			
Cycle Q Clear(g_c), s	29.8	0.0	0.0	0.0	8.1	42.8	8.9	0.0	7.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1030	3973	0	0	3242	1146	317	0	263			
V/C Ratio(X)	1.55	0.30	0.00	0.00	0.29	1.35	1.15	0.00	0.80			
Avail Cap(c_a), veh/h	1030	3973	0	0	3242	1146	317	0	263			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.1	0.0	0.0	0.0	18.7	28.6	45.5	0.0	44.7			
Incr Delay (d2), s/veh	250.3	0.1	0.0	0.0	0.2	162.4	98.0	0.0	15.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	18.6	0.0	0.0	0.0	2.7	38.2	8.2	0.0	3.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	275.4	0.1	0.0	0.0	18.9	191.0	143.6	0.0	59.9			
LnGrp LOS	F	A	A	A	B	F	F	A	E			
Approach Vol, veh/h		2797			2485			576				
Approach Delay, s/veh		157.1			125.9			112.9				
Approach LOS		F			F			F				

Timer - Assigned Phs	2		5	6		8
Phs Duration (G+Y+Rc), s	85.0		35.0	50.0		15.0
Change Period (Y+Rc), s	7.2		* 5.2	7.2		6.1
Max Green Setting (Gmax), s	77.8		* 30	42.8		8.9
Max Q Clear Time (g_c+I1), s	2.0		31.8	44.8		10.9
Green Ext Time (p_c), s	5.8		0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	139.5
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX I

SIM TRAFFIC QUEUE ANALYSIS CALCULATION SHEETS

Intersection: 1: Torreyana Rd & Northern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	22	15	9	6
Average Queue (ft)	1	1	0	0
95th Queue (ft)	12	8	6	4
Link Distance (ft)	99	96	365	138
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Torreyana Rd & Callan Rd/Southern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	136	18	80	32
Average Queue (ft)	69	1	41	17
95th Queue (ft)	106	8	67	41
Link Distance (ft)	314	197	165	365
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Callan Rd & N. Torrey Pines Pl

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	42	30
Average Queue (ft)	2	13
95th Queue (ft)	18	36
Link Distance (ft)	271	254
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	T
Maximum Queue (ft)	82	82	92	150	24	254	324	254	382	255	199	340
Average Queue (ft)	13	38	6	60	8	113	146	96	59	141	122	131
95th Queue (ft)	45	67	44	117	25	205	269	210	236	261	203	266
Link Distance (ft)	157			441			375	375	375			336
Upstream Blk Time (%)							0		0			1
Queuing Penalty (veh)							0		0			0
Storage Bay Dist (ft)		60	300		300	260				230	175	
Storage Blk Time (%)	1	1				0	1			3	5	3
Queuing Penalty (veh)	1	0				1	1			7	10	5

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	257	124	48
Average Queue (ft)	79	18	7
95th Queue (ft)	191	72	30
Link Distance (ft)	336	336	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	R	L	L	T	T	T	L
Maximum Queue (ft)	20	152	227	166	73	36	93	108	322	306	289	829
Average Queue (ft)	1	28	135	89	4	5	39	53	253	233	195	670
95th Queue (ft)	13	92	204	168	32	21	78	95	307	291	268	968
Link Distance (ft)			497	497	497		452	452	452	452	452	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	290	290				440						805
Storage Blk Time (%)												0
Queuing Penalty (veh)												1

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB
Directions Served	LT	R	R
Maximum Queue (ft)	1024	1019	830
Average Queue (ft)	968	948	641
95th Queue (ft)	1089	1184	1014
Link Distance (ft)	973	973	
Upstream Blk Time (%)	30	27	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			805
Storage Blk Time (%)	40	10	0
Queuing Penalty (veh)	302	88	4

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	115	140	307	293	256	43	228	288	227	138	196	165
Average Queue (ft)	55	76	235	216	178	2	34	188	140	32	87	31
95th Queue (ft)	100	124	290	273	236	23	129	263	210	112	163	118
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0	1				
Queuing Penalty (veh)							0	4				

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	869	1114	965	197
Average Queue (ft)	587	1022	755	97
95th Queue (ft)	1101	1187	1337	178
Link Distance (ft)		1070		
Upstream Blk Time (%)		16		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	36	0	
Queuing Penalty (veh)	2	647	7	

Network Summary

Network wide Queuing Penalty: 1079

Intersection: 1: Torreyana Rd & Northern Project Dwy

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	19	36	17
Average Queue (ft)	1	13	1
95th Queue (ft)	10	35	8
Link Distance (ft)	99	96	138
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Torreyana Rd & Callan Rd/Southern Project Dwy

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	58	88	97
Average Queue (ft)	26	45	50
95th Queue (ft)	52	74	79
Link Distance (ft)	314	165	365
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Callan Rd & N. Torrey Pines Pl

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	65	20	66
Average Queue (ft)	25	1	30
95th Queue (ft)	56	12	54
Link Distance (ft)	271	798	254
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	T
Maximum Queue (ft)	84	80	319	446	325	277	362	285	188	56	153	351
Average Queue (ft)	26	29	213	279	72	148	188	140	58	18	17	239
95th Queue (ft)	65	61	309	403	240	248	309	249	151	42	80	345
Link Distance (ft)	157			441			375	375	375			336
Upstream Blk Time (%)				1			0	0				1
Queuing Penalty (veh)				0			0	0				0
Storage Bay Dist (ft)		60	300		300	260				230	175	
Storage Blk Time (%)	2	0	0	5	0	1	2		0			23
Queuing Penalty (veh)	1	0	0	20	0	4	3		0			3

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	289	201	29
Average Queue (ft)	176	62	4
95th Queue (ft)	278	172	20
Link Distance (ft)	336	336	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			100
Storage Blk Time (%)		1	
Queuing Penalty (veh)		0	

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	302	315	543	518	382	313	275	191	229	174	162	138
Average Queue (ft)	300	315	518	367	44	136	81	104	140	98	83	57
95th Queue (ft)	307	316	536	640	180	256	212	172	212	158	145	118
Link Distance (ft)			497	497	497			452	452	452	452	452
Upstream Blk Time (%)			72	4	0							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	290	290				440	440					
Storage Blk Time (%)	13	72	10									
Queuing Penalty (veh)	53	306	85									

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB	SB
Directions Served	L	LT	R	R
Maximum Queue (ft)	270	319	147	86
Average Queue (ft)	125	197	75	32
95th Queue (ft)	248	286	119	65
Link Distance (ft)		973	973	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	805			805
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	491	478	119	89	90	152	197	195	202	595	425	412
Average Queue (ft)	463	463	12	13	13	23	84	102	67	563	425	397
95th Queue (ft)	478	473	72	56	53	96	165	177	161	622	426	440
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)	12	16								22		
Queuing Penalty (veh)	60	80								0		
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0			0	20	2
Queuing Penalty (veh)							0			2	35	3

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	833	1029	700	70
Average Queue (ft)	586	748	291	24
95th Queue (ft)	1002	1160	956	55
Link Distance (ft)		1070		
Upstream Blk Time (%)		21		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	31	0	
Queuing Penalty (veh)	1	110	0	

Network Summary

Network wide Queuing Penalty: 767

Intersection: 1: Torreyana Rd & Northern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	16	33	40	15
Average Queue (ft)	1	12	2	0
95th Queue (ft)	9	34	17	7
Link Distance (ft)	99	96	365	138
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Torreyana Rd & Callan Rd/Southern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	156	24	91	43
Average Queue (ft)	82	2	49	24
95th Queue (ft)	132	14	79	44
Link Distance (ft)	314	197	165	365
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Callan Rd & N. Torrey Pines Pl

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	29	33
Average Queue (ft)	2	12
95th Queue (ft)	16	37
Link Distance (ft)	271	254
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	T
Maximum Queue (ft)	91	81	115	154	28	253	320	246	394	255	199	322
Average Queue (ft)	14	39	9	70	7	110	165	114	92	165	127	139
95th Queue (ft)	52	69	54	128	25	196	282	222	309	286	211	270
Link Distance (ft)	157			441			375	375	375			336
Upstream Blk Time (%)	0						0		2			1
Queuing Penalty (veh)	0						0		0			0
Storage Bay Dist (ft)		60	300		300	260				230	175	
Storage Blk Time (%)	0	2				0	1		0	6	6	2
Queuing Penalty (veh)	1	0				0	1		0	17	14	4

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	248	128	34
Average Queue (ft)	78	19	7
95th Queue (ft)	181	73	23
Link Distance (ft)	336	336	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	10	146	225	186	78	42	1	83	109	324	324	310
Average Queue (ft)	0	24	138	88	5	7	0	37	51	258	242	202
95th Queue (ft)	4	80	209	174	40	26	1	71	96	309	302	281
Link Distance (ft)			497	497	497			452	452	452	452	452
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	290	290				440	440					
Storage Blk Time (%)			0									
Queuing Penalty (veh)			0									

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB	SB
Directions Served	L	LT	R	R
Maximum Queue (ft)	829	1019	1022	830
Average Queue (ft)	674	963	955	631
95th Queue (ft)	947	1097	1147	990
Link Distance (ft)		973	973	
Upstream Blk Time (%)		29	26	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)	805			805
Storage Blk Time (%)	0	36	10	0
Queuing Penalty (veh)	1	277	87	3

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	109	138	313	296	243	32	237	314	248	151	191	159
Average Queue (ft)	51	75	237	215	175	1	43	197	148	41	85	31
95th Queue (ft)	94	119	295	272	229	24	155	283	226	129	161	117
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0	2				
Queuing Penalty (veh)							0	8				

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	869	1111	965	204
Average Queue (ft)	594	1029	789	98
95th Queue (ft)	1109	1197	1334	179
Link Distance (ft)		1070		
Upstream Blk Time (%)		16		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	37	1	
Queuing Penalty (veh)	1	665	8	

Network Summary

Network wide Queuing Penalty: 1087

Intersection: 1: Torreyana Rd & Northern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	22	77	3	18
Average Queue (ft)	1	36	0	1
95th Queue (ft)	10	64	3	10
Link Distance (ft)	99	96	365	138
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Torreyana Rd & Callan Rd/Southern Project Dwy

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	62	31	91	143
Average Queue (ft)	29	6	48	66
95th Queue (ft)	54	26	76	110
Link Distance (ft)	314	197	165	365
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Callan Rd & N. Torrey Pines Pl

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	74	32	59
Average Queue (ft)	25	2	28
95th Queue (ft)	57	16	51
Link Distance (ft)	271	798	254
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	T
Maximum Queue (ft)	108	75	324	448	325	282	351	276	181	50	168	355
Average Queue (ft)	24	28	225	301	79	155	191	150	63	19	17	260
95th Queue (ft)	69	57	328	441	258	258	303	250	159	41	83	360
Link Distance (ft)	157			441			375	375	375			336
Upstream Blk Time (%)	0			2			0	0				2
Queuing Penalty (veh)	0			0			0	0				0
Storage Bay Dist (ft)		60	300		300	260				230	175	
Storage Blk Time (%)	2	0	0	7	0	1	2					27
Queuing Penalty (veh)	1	0	1	32	0	4	3					3

Intersection: 4: N Torrey Pines Rd & Science Park Rd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	315	206	21
Average Queue (ft)	192	77	3
95th Queue (ft)	290	190	15
Link Distance (ft)	336	336	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			100
Storage Blk Time (%)		1	
Queuing Penalty (veh)		0	

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	302	315	552	513	371	335	254	187	217	166	167	139
Average Queue (ft)	301	315	518	354	42	132	76	103	135	102	87	58
95th Queue (ft)	306	315	538	625	189	264	209	167	198	159	150	119
Link Distance (ft)			497	497	497			452	452	452	452	452
Upstream Blk Time (%)			75	3	0							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	290	290				440	440					
Storage Blk Time (%)	15	74	9		0	0						
Queuing Penalty (veh)	65	320	81		0	0						

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB	SB
Directions Served	L	LT	R	R
Maximum Queue (ft)	274	314	152	105
Average Queue (ft)	127	199	77	34
95th Queue (ft)	245	282	125	75
Link Distance (ft)		973	973	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	805			805
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	492	477	60	74	79	141	216	208	154	592	425	412
Average Queue (ft)	464	463	7	12	11	25	91	103	64	557	425	398
95th Queue (ft)	480	472	33	47	47	101	173	178	138	665	429	437
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)	13	16								23		
Queuing Penalty (veh)	65	83								0		
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0	0		0	21	2
Queuing Penalty (veh)							0	0		2	36	3

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	870	1079	880	63
Average Queue (ft)	687	878	478	26
95th Queue (ft)	1107	1278	1229	59
Link Distance (ft)		1070		
Upstream Blk Time (%)		36		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	53	0	
Queuing Penalty (veh)	1	192	1	

Network Summary

Network wide Queuing Penalty: 895

APPENDIX J

EXCERPTS FROM THE SAN DIEGO FORWARD: THE 2021 REGIONAL PLAN

Appendix A:

Transportation Projects, Programs, and Phasing

Final

December 2021

Appendix A: Transportation Projects, Programs, and Phasing

San Diego Forward: The 2021 Regional Plan (2021 Regional Plan) re-envisions the regional transportation system that connects us to where we want to go. This appendix breaks down the system into its components—projects, programs, and operations. It details how each project is phased, when specific improvements are expected to be completed, and their cost. Details on cost estimation are included in Appendix U: Cost Estimation Methodology.

California Assembly Bill 805 (Gonzalez Fletcher, 2017) (Chapter 658, Statutes of 2017) requires, among other things, that the 2021 Regional Plan identify disadvantaged communities and include transportation strategies to reduce pollution in these communities. Appendix A, Attachment 2 shows the location of disadvantaged communities and identifies specific transportation strategies to reduce exposure to pollution in these communities.

The tables that detail projects in this appendix include information such as the name of the project, a description of the project, and the cost of the project in 2020 dollars as part of the financially constrained plan. Table A.19 shows several illustrative goods movement projects for which funding has not yet been identified (i.e., they are considered part of a financially "unconstrained" plan).

This appendix is organized generally as follows:

1. A description of the types of transportation improvements that make up the transportation system.
2. A series of tables that identify specific transportation improvements by corridor (**Tables A.1–A.11:** Major Corridors)
3. A series of tables that identify specific transportation improvements by type:
    - **Table A.12:** Rural Corridors
    - **Table A.13:** Arterials
    - **Table A.14:** Mobility Hubs and Flexible Fleets
    - **Table A.15:** Next Operating System
    - **Table A.16:** Systemwide Transit Supportive Services
    - **Table A.17:** Supporting Policies and Programs
    - **Table A.18:** Other Systemwide Programs
    - **Table A.19:** Unconstrained Goods Movement Projects
4. A series of maps that show the progression of improvement through the implementation phases

Types of Transportation Improvements

Transportation improvements identified for each of the major corridors in Table A.1 through Table A.11 are grouped into the following project types and include a year-built phasing period (2025, 2035, and 2050) for each project.

Active Transportation

Active transportation projects include both on- and off-street improvements to create safe and comfortable paths for walking and biking. The costs reflect the comprehensive nature of active transportation projects, which often include retrofitting existing streets and roadways to meet the needs of users of all ages and abilities.

Complete Corridor: Active Transportation and Demand Management/Smart Intersection Systems

Active Transportation and Demand Management (ATDM) and Smart Intersection Systems (SIS) use technology to improve traffic flow and safety on our roadways. These technologies have been applied to freeways and arterial roadways in the regional transportation system.

Complete Corridor: Managed Lanes

Managed Lanes (MLs) offer priority access to people using transit, carpooling, riding motorcycles, or vanpooling along with emergency vehicles and some low-emission vehicles with appropriate decals. An example of MLs is currently on I-15 between SR 163 and SR 78. In the 2021 Regional Plan, MLs are expanded by repurposing shoulders or existing travel lanes, as feasible. Maps and tables in this appendix use descriptions of MLs to indicate the number of MLs in addition to the freeway lanes included in the total configuration for that phase. For example, a freeway segment labeled “8F+2ML” would represent eight freeway lanes plus two MLs on that segment. Many of the MLs will be fully built by 2035.

ML improvements are planned for both interregional and urban corridors. Interregional corridors connect us to neighboring counties and beyond and account for about 70% of vehicle miles driven on the region’s freeways. Urban corridors connect local cities and account for 27% of vehicle miles driven on the region’s freeways. Interregional corridor trips are typically longer than 20 miles while trips made on urban corridors are often between 5 and 20 miles.

Complete Corridor: Managed Lanes Connectors and Direct Access Ramps

Managed Lane Connectors (MLCs) seamlessly connect MLs, for example connecting an ML on I-15 to a future ML on SR 78. Direct Access Ramps (DARs) are freeway on-ramps that connect a local road directly to an ML on the freeway. These improvements could take the form of a transit-only lane, ramp modification, or technology enhancement. Also, some projects are included as Interchange and Arterial Operation Improvements which are improvements to facilities and adjacent roadways that connect two intersecting facilities.

Transit Leap

Transit Leap improvements make public transit a compelling option to driving—fast, convenient, and safe. Improvements include commuter rail, light rail, *Rapid*, local bus, and ferry service. Next Generation *Rapid* Service is a *Rapid* bus service operating in priority travel lanes and/or separated guideways and is given traffic signal priority. Many of the *Rapid* routes will be fully built in 2035 and 2050 as described in the tables, while some of the *Rapid* routes will be expedited to open sooner in 2025 with a "light version" (Phase 1). The light version of *Rapid* is meant to allow for a *Rapid* route to operate with minimal capital investment using existing bus stops. The full version of *Rapid* will build up the route's amenities with improved shelters, bus guideways, and/or other transit priority measures. Commuter rail includes new and significantly upgraded rail service with high-speed trains that are fast and convenient and provide a compelling alternative to driving. Light Rail Transit (LRT) includes improvements to existing light rail services and new tram services. Ferry service operating in San Diego Bay is also included here.

Goods Movement

Projects in this category support goods movement improvements at freight gateways (land border crossings, maritime terminals, and air cargo terminals), on rail lines, and on roadways. Goods movement supportive projects are sometimes aligned with ML or other Complete Corridor and Transit Leap projects and are indicated in the tables; others are stand-alone projects for goods movement improvements.

Transportation System Phasing

The transportation system in the 2021 Regional Plan and its phasing by 2025, 2035, and 2050 are designed to address social equity, congestion, and state/federal mandates. Project "phasing" is a reference to the specific time periods when projects are anticipated to be in service and available to the public. For the 2021 Regional Plan, the 2025 phase year includes projects planned to be in service between 2021 and 2025; the 2035 phase year references the time period where projects would be in service between 2026 and 2035; and the 2050 phase year references the time period where projects would be in service between 2036 and 2050. The intent of the project phasing is to advance as many Transit Leap projects as possible first along with their associated supportive roadway improvements (such as MLs) based on the anticipated revenues.

Additionally, staff considered various factors and inputs in both the development and phasing of the projects and programs included in the 2021 Regional Plan, which are summarized as follows (and further described in Appendix T: Network Development and Performance):

- **Project Readiness:** A review and understanding of project readiness to help ensure that projects are ready for development and implementation as planned. This includes the evaluation of project construction duration by project type (e.g., Complete Corridor, Transit Leap, etc.), which often varies by mode type (e.g.,

commuter rail, *Rapid*, etc.). Timeframe observed on current or previous projects of similar type help to inform this component.

- **Project Connectivity:** Project connectivity is considered largely to leverage synergies among projects (e.g., MLCs for intersecting MLs or *Rapid* service on MLs) and timelines of adjacent supportive projects, and to ensure that projects are phased in consecutive segments.
- **Evaluation Criteria:** Evaluation criteria is a helpful tool to showcase the merits of projects or a group of projects. For the 2021 Regional Plan, SANDAG applied a project "bundle" (grouped projects by corridor) evaluation criteria approach to rank corridors according to anticipated benefit. The criteria included prioritizing access to transit for the region's social equity focus populations among other things.
- **Phased Revenues:** Anticipated revenues are essential to determining what projects are included in the financially constrained 2021 Regional Plan and when those projects can be anticipated for construction and operation. The type of funding available is also critical because, for example, some funding sources only can be used for capital or construction projects and other sources for operating transit services or road maintenance.

Each of these factors was scored in order to help phase individual projects in the transportation system according to the type of project. For transit projects, projected ridership on individual routes (estimated by initial travel modeling) was considered in order to further clarify project phasing. This helped determine which transit projects to advance in earlier phases, particularly by 2035, based on the availability of revenues. Emphasis was placed on aligning flexible funding with transit projects and operational improvements, given the need to meet federal and state mandates for social equity, air quality, and greenhouse gas reductions.

Major Corridors

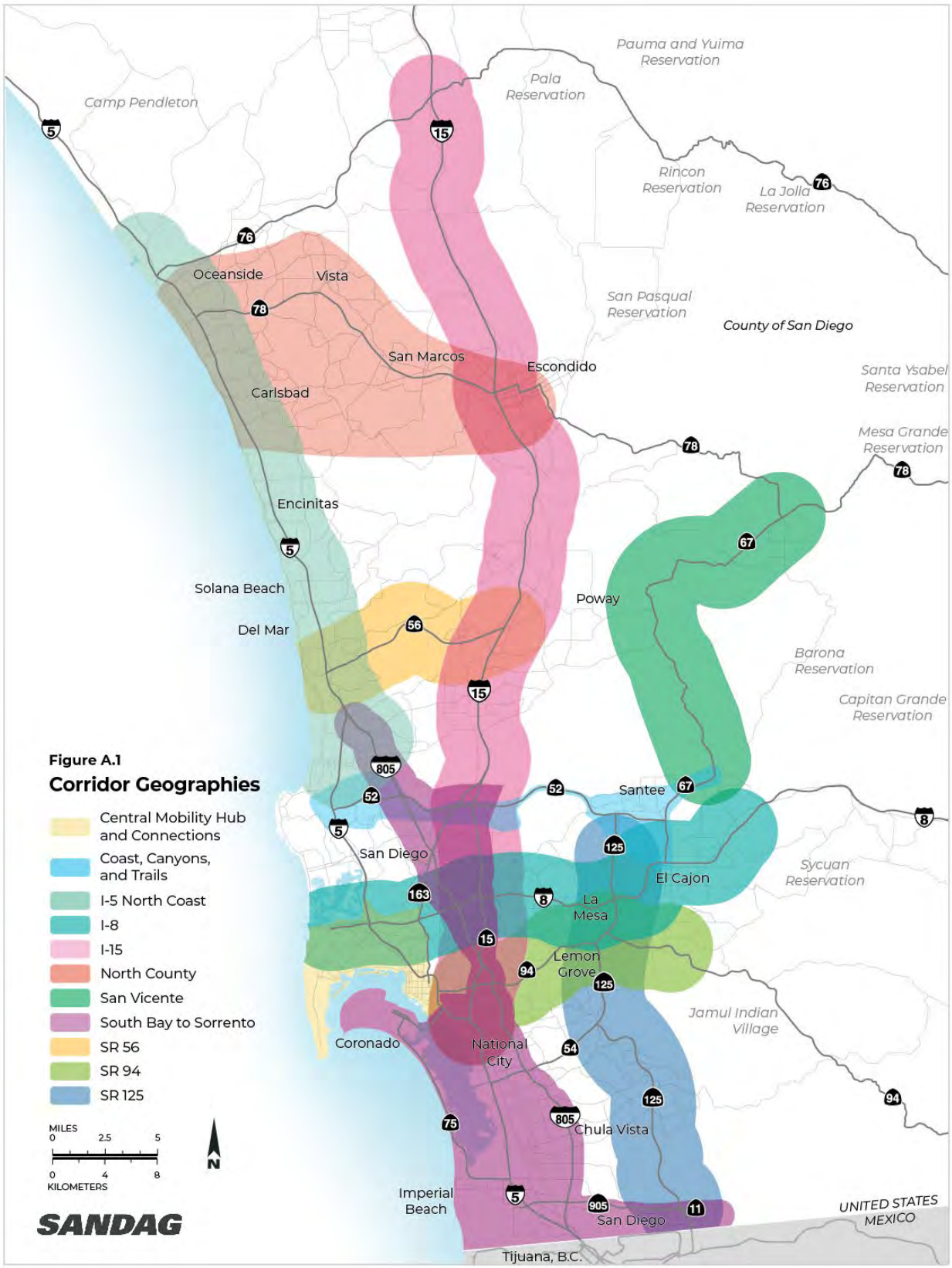
Our region's 3.3 million residents, and others who visit to do business here, vacation, visit family, and even just pass through the area on their way to somewhere else, rely on major corridors for travel. They make up the primary circulatory system that keeps people moving as they seek economic opportunity, pursue education and training, and travel for a myriad of other reasons that enhance their quality of life.

The 2021 Regional Plan charts a course for "Complete Corridors" that will make travel along them safer and more efficient, while offering people more alternatives to driving alone—including more transit options, more rideshare options, and more opportunities for biking, walking, and other forms of active transportation. Along these major corridors of travel, mobility hubs will be strategically placed to offer people vital connections to a variety of transportation options for both short and long trips. Mobility hubs will be places of connectivity where people work, live, and connect with one another and the modes of travel they need to reach their destinations.

The 2021 Regional Plan has identified 11 major corridors of travel in our region, as well as improvements for each corridor. This appendix details those improvements. Tables A.1 through A.11 include detailed listings of the transit, roadway, active transportation, and technology improvements for each of the corridors. Figure A.1 depicts the 11 major corridors of travel in our region. Plans for a regional Central Mobility Hub north of Downtown San Diego, and the connections it will provide to the San Diego International Airport and numerous other destinations, is included in this list as it will serve as a major corridor of travel in its own right. The 11 major corridors discussed in the 2021 Regional Plan are:

1. South Bay to Sorrento Corridor
2. Central Mobility Hub and Connections
3. State Route 125 Corridor
4. Interstate 15 Corridor
5. Interstate 5 North Coast Corridor
6. State Route 94 Corridor
7. Interstate 8 Corridor
8. Coast, Canyons, and Trails Corridor
9. State Route 56 Corridor
10. San Vicente Corridor
11. North County Corridor

Figure A.1: Corridor Geographies



South Bay to Sorrento Corridor

Essential to international trade with Mexico and a key north-south corridor for people who live in communities throughout the South Bay and work in San Diego, the South Bay to Sorrento Corridor is vital for the region's economic prosperity. As a result, the 28 miles it covers are some of the region's most congested. The South Bay to Sorrento Corridor features significant transportation infrastructure designed to move people and goods between the U.S. and Mexico, through densely populated South Bay and Central San Diego communities, and to the region's largest employment centers in Kearny Mesa and Sorrento Valley. The corridor traverses several cities in San Diego County, including San Diego, Chula Vista, Coronado, National City, and Imperial Beach. Major roadways include I-5, I-8, I-805, SR 52, SR 54, SR 94, and SR 905. Travelers along this corridor are also served by major arterials and the Bayshore Bikeway. People who travel using public transportation can ride the COASTER, the UC San Diego Blue Line Trolley, multiple *Rapid* lines, and more than 25 local bus lines. The Orange and Green Line Trolley also bisect this corridor. Given the importance of this heavily traveled corridor to regional and international mobility, a variety of transportation improvements are planned. Some of these improvements include the following:

Active Transportation

Nearly 30 projects are planned to build up the interconnected bikeway systems along this corridor.

Complete Corridor: Managed Lanes and Goods Movement

MLs added to I-5 and I-805 will ease congestion—in part by giving priority access to *Rapid* transit vehicles—and promote seamless travel throughout the region. The movement of freight and other goods within the region and across the international border will become more efficient through improvements to SR 11, SR 905, I-5, and I-805; Harbor Drive; and new and improved facilities at land and sea ports of entry (POEs).

Transit Leap/Mobility Hubs

The much-anticipated commuter rail project in this corridor is the Purple Line at the heart of the South Bay to Sorrento Corridor. It will connect nearly the entire corridor, from San Ysidro to many of our region's urban communities and major job centers in Kearny Mesa, University City, and Sorrento Valley. Additionally, there are plans to enhance existing Trolley lines, including the Blue Line, to allow for higher speeds, broader spans of service, and more capacity. Complementing the expanded Trolley lines and providing travelers with additional public transit choices, the *Rapid* transit program will include more than 20 routes along the South Bay to Sorrento Corridor—many of which are scheduled to be in service before 2035. Mobility hubs are places of connectivity where mobility services, technology, and a variety of amenities create a landing spot for travelers to connect with high-frequency transit services, bike and rideshare options, and a variety of other modes of travel. One of the largest mobility hubs in the region is being planned at the San Ysidro Intermodal Transit Center at the international border with Mexico. Other mobility hubs are planned for urban communities and major education and employment centers throughout the corridor.

Figure A.2: South Bay to Sorrento

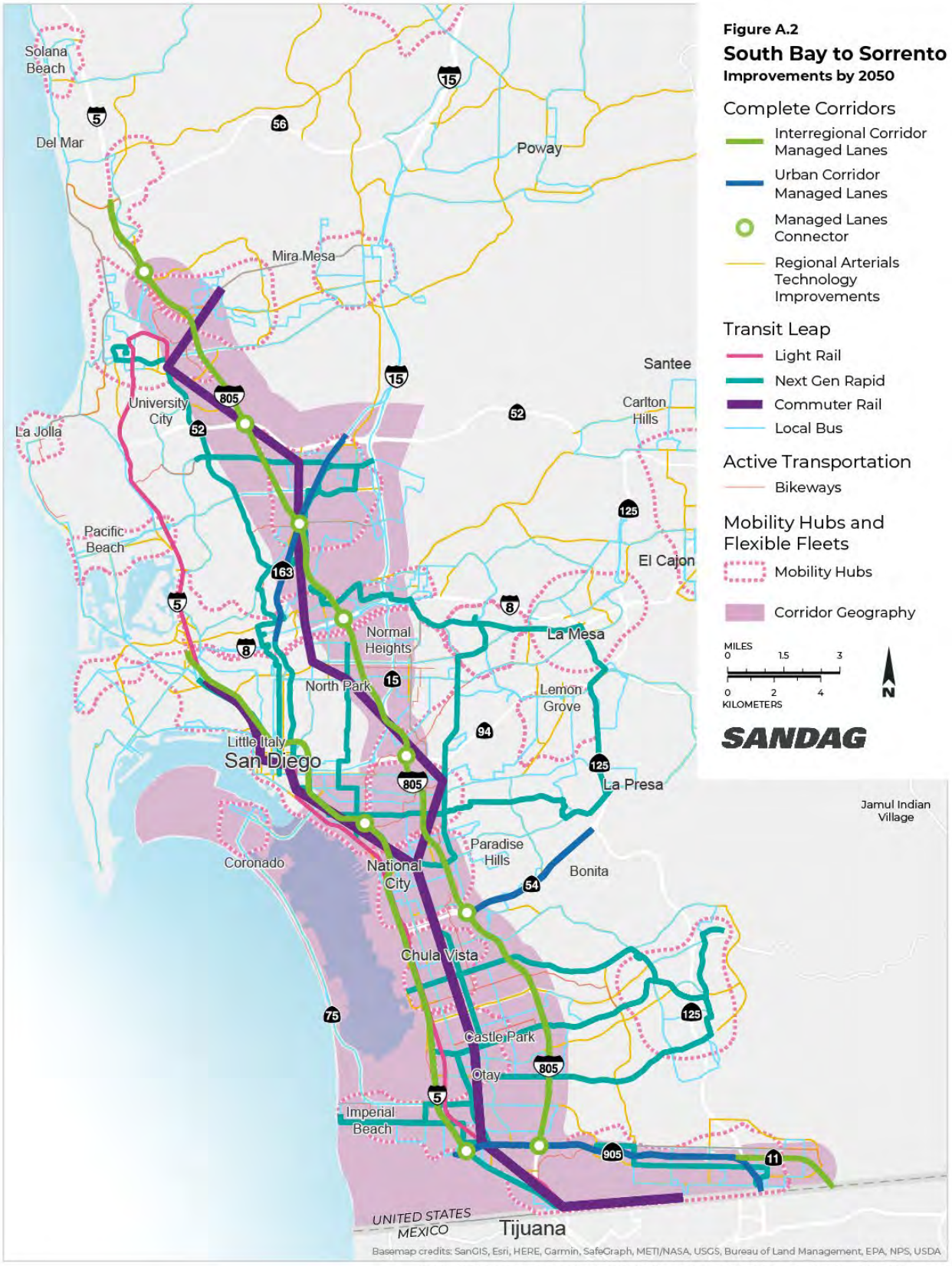


Figure shows improvements along this corridor. Investments in other corridors are shown in corresponding maps.

Table A.1: South Bay to Sorrento

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
AT002	2025	Active Transportation	Central Avenue Bikeway	Off-Street and On-Street	I-8, I-15, SR 94	$4
AT004	2025	Active Transportation	North Park/Mid-City Bikeways: Orange Avenue	On-Street	I-8, I-15	$11
AT005	2025	Active Transportation	North Park/Mid-City Bikeways: Howard Avenue	On-Street	I-8, Central Mobility Hub (CMH)	$9
AT006	2025	Active Transportation	North Park/Mid-City Bikeways: Robinson Avenue	Off-Street and On-Street	I-8	$5
AT008	2025	Active Transportation	Bayshore Bikeway: Ada Street to Palomar Street	Off-Street	N/A	$3
AT015	2035	Active Transportation	Bayshore Bikeway: Main Street to Ada Street	Off-Street	N/A	$5
AT019	2035	Active Transportation	Chula Vista (J Street) Bikeway	On-Street	N/A	$9
AT021	2035	Active Transportation	City Heights/Fairmount Corridor	Off-Street and On-Street	I-8	$44
AT032	2035	Active Transportation	Coastal Rail Trail San Diego – Carmel Valley to Roselle via Sorrento	Off-Street	I-5 North Coast Corridor (NCC), SR 56	$20
AT033	2035	Active Transportation	Coastal Rail Trail San Diego – Del Mar to Sorrento via Carmel Valley	Off-Street	I-5 NCC, SR 56	$23
AT036	2035	Active Transportation	Coastal Rail Trail San Diego – Roselle Canyon	Off-Street	I-5 NCC	$12
AT037	2035	Active Transportation	Coastal Rail Trail San Diego – University Town Center (UTC) to Rose Canyon	Off-Street	I-5 NCC, Coast, Canyons, and Trails (CCT)	$11
AT040	2035	Active Transportation	Encanto to Chula Vista National City connections	On-Street	I-15	$35
AT047	2035	Active Transportation	Imperial Beach Connector	On-Street	N/A	$10
AT066	2050	Active Transportation	Bay to Ranch Bikeway	On-Street	N/A	$27
AT067	2050	Active Transportation	Border Access Corridor	Off-Street	N/A	$3
AT070	2050	Active Transportation	Central Coast Corridor	On-Street	SR 56, CCT	$65

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
AT071	2050	Active Transportation	Chula Vista Greenbelt	On-Street	N/A	$34
AT072	2050	Active Transportation	Clairemont – Centre City Corridor	Off-Street and On-Street	I-8, CCT, CMH	$52
AT096	2050	Active Transportation	I-805 Connector	Off-Street	N/A	$7
AT097	2050	Active Transportation	I-805 Connector – Bonita Road to Floyd Avenue	Off-Street	N/A	$10
AT100	2050	Active Transportation	Kearny Mesa to Beaches Corridor – Genesee Avenue to Linda Vista Road	On-Street	N/A	$8
AT101	2050	Active Transportation	Kearny Mesa to Beaches Corridor – Linda Vista Road to I-15 Bikeway	On-Street	I-15	$14
AT107	2050	Active Transportation	Mira Mesa Corridor – I-805 to Scranton Road	On-Street	N/A	$2
AT108	2050	Active Transportation	Mira Mesa Corridor – Scranton Road to I-15 Bikeway	On-Street	I-15	$30
AT109	2050	Active Transportation	Mira Mesa Corridor – Sorrento Valley Boulevard to Mira Mesa Boulevard	On-Street	N/A	$7
AT122	2050	Active Transportation	SR 56 Bikeway – El Camino Real to Caminito Pointe	Off-Street	I-5 NCC, SR 56	$5
AT123	2050	Active Transportation	SR 905 Corridor	Off-Street	SR 125	$74
AT152	2050	Active Transportation	Chollas Creek Bikeways: North Fork – Bayshore Bikeway to University Bikeway and South Fork – Petway Park to Market Creek Plaza[1]	Off-Street and On-Street	SR 94	$85
CC119	2025	Complete Corridor: ATDM/SIS	I-5	SIS	I-5 NCC	$69
CC121	2025	Complete Corridor: ATDM/SIS	I-805	SIS	N/A	$37
CC135	2025	Complete Corridor: ATDM/SIS	SR 54	SIS	N/A	$16
CC141	2025	Complete Corridor: ATDM/SIS	SR 905	SIS	SR 125	$30

[1] Project to be developed in coordination with the City of San Diego including City of San Diego Capital Improvement Program (CIP) project B-17113 (Chollas Creek to Bayshore Bikeway).

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
CC118	2035	Complete Corridor: ATDM/SIS	I-5	ATDM	I-5 NCC	$888
CC120	2035	Complete Corridor: ATDM/SIS	I-805	ATDM	N/A	$478
CC134	2035	Complete Corridor: ATDM/SIS	SR 54	ATDM	N/A	$73
CC140	2035	Complete Corridor: ATDM/SIS	SR 905	ATDM	SR 125	$157
CC038	2035	Complete Corridor: ML	SR 163 (I-8 to I-805)	8F to 6F+2ML	I-8, CMH	$36
CC039	2035	Complete Corridor: ML	SR 163 (I-805 to SR 52)	8F to 6F+2ML	I-15, CCT	$27
CC040	2050	Complete Corridor: ML	SR 54 (I-805 to SR 125)	6F to 4F+2ML	SR 125	$48
CC045	2025	Complete Corridor: ML/ Goods Movement	SR 11/Otay Mesa East POE (Enrico Fermi to Mexico)	— to 4Toll+POE	SR 125	$482
CC001	2035	Complete Corridor: ML/ Goods Movement	I-5 (SR 905 to H Street)	8F to 6F+2ML	N/A	$51
CC002	2035	Complete Corridor: ML/ Goods Movement	I-5 (H Street to Pacific Highway)	8F to 6F+4ML	I-8, I-15, SR 94, CMH	$378
CC005	2035	Complete Corridor: ML/ Goods Movement	I-5 (I-805 to SR 56)	8F/14F+2HOV to 6F/12F+4ML	I-5 NCC, SR 56	$25
CC017	2035	Complete Corridor: ML/ Goods Movement	I-805 (Palm Avenue to H Street)	8F/8F+2ML to 6F+4ML	N/A	$46
CC018	2035	Complete Corridor: ML/ Goods Movement	I-805 (H Street to I-15)	8F+2ML to 6F+4ML	I-15, SR 94	$163
CC019	2035	Complete Corridor: ML/ Goods Movement	I-805 (SR 15 to I-8)	8F to 6F+4ML	I-8, I-15, SR 94	$96
CC020	2035	Complete Corridor: ML/ Goods Movement	I-805 (I-8 to Mesa College Drive)	10F to 6F+4ML	I-8, I-15	$56
CC021	2035	Complete Corridor: ML/ Goods Movement	I-805 (Mesa College Drive to Balboa Avenue)	8F to 6F+4ML	CCT	$58
CC022	2035	Complete Corridor: ML/ Goods Movement	I-805 (Balboa Avenue to Northbound Bypass Lane)	8F+2ML to 6F+4ML	CCT	$149
CC016	2050	Complete Corridor: ML/ Goods Movement	I-805 (SR 905 to Palm Avenue)	8F to 6F+4ML	N/A	$60
CC041	2050	Complete Corridor: ML/Goods Movement	SR 905 (I-5 to Border)	6F to 4F+2ML	SR 125	$193

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
CC115	2050	Complete Corridor: DAR	SR 905 (Beyer Boulevard)	East	N/A	$42
CC116	2050	Complete Corridor: DAR	SR 905 (Siempre Viva Road)	North	SR 125	$42
CC114	2035	Complete Corridor: Transit Operational Improvement	I-805 (Nobel Drive)	North and South	CCT	$49
CC063	2035	Complete Corridor: MLC	I-5 (I-805)	North to North and South to South	N/A	$84
CC069	2035	Complete Corridor: MLC	I-5 (SR 15)	North to North and South to South	I-15, SR 94	$274
CC070	2035	Complete Corridor: MLC	I-5 (SR 15)	South to North and South to North	I-15, SR 94	$274
CC084	2035	Complete Corridor: MLC	I-805 (SR 94)	North to West and East to South	I-15, SR 94	$140
CC085	2035	Complete Corridor: MLC	I-805 (SR 52)	West to North and South to East	CCT	$149
CC087	2035	Complete Corridor: MLC	I-805 (SR 163)	North to North and South to South	N/A	$267
CC090	2035	Complete Corridor: MLC	I-805 (I-8)	North to East and West to South	I-8, I-15	$202
CC092	2035	Complete Corridor: MLC	I-805 (I-8)	South to East and West to North	I-8, I-15	$202
CC071	2050	Complete Corridor: MLC	I-5 (SR 905)	South to East and West to North	N/A	$202
CC086	2050	Complete Corridor: MLC	I-805 (SR 52)	North to West and East to South	CCT	$126
CC089	2050	Complete Corridor: MLC	I-805 (I-8)	North to West and East to South	I-8, I-15	$202
CC091	2050	Complete Corridor: MLC	I-805 (I-8)	South to West and East to North	I-8, I-15	$202
CC093	2050	Complete Corridor: MLC	I-805 (SR 54)	South to East and West to North	N/A	$219
CC094	2050	Complete Corridor: MLC	I-805 (SR 54)	North to East and West to South	N/A	$219
CC095	2050	Complete Corridor: MLC	I-805 (SR 905)	South to West and East to North	N/A	$202
CC096	2050	Complete Corridor: MLC	I-805 (SR 905)	South to East and West to North	N/A	$202
GM01	2025	Goods Movement: Border	Otay Mesa Commercial Vehicle Enforcement Facility (CVEF) Modernization	N/A	N/A	$6
GM02	2025	Goods Movement: Border	Otay Mesa East POE Pilot Programs to Reduce Commercial Vehicle Wait Times	N/A	N/A	$20
GM03	2025	Goods Movement: Border	Otay Mesa Southbound Truck Route and La Media Road	N/A	N/A	$49

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
GM04	2050	Goods Movement: Border	Otay Mesa POE Truck Bridge to CVEF	N/A	N/A	$50
GM07	2025	Goods Movement: Roadways	Regional Border Management System and Tolling Equipment	N/A	N/A	$35
GM06	2035	Goods Movement: Roadways	Harbor Drive 2.0: Designated Freight Route: Dedicated lanes and signal priority for truck freight along Harbor Drive	N/A	N/A	$32
GM08	2035	Goods Movement: Roadways	I-5 Working Waterfront Access: Bottleneck Relief between SR 94 and SR 54	N/A	N/A	$50
GM09	2035	Goods Movement: Roadways	Vesta Bridge – Phase 1: Operational improvements SR 15, Main, Harbor, and 32nd Streets	N/A	N/A	$55
GM05	2050	Goods Movement: Roadways	Harbor Drive Multimodal Corridor Improvements: Intelligent transportation systems, removing height and weight conflicts along the truck route, pedestrian crossings and bridges, various truck improvements, bikeway accommodations, streetscape, safety, and parking improvements	N/A	N/A	$192
TL21	2025	Transit Leap	*Rapid* 12 Phase 1	Spring Valley to Downtown via Southeast San Diego (light version of *Rapid*)	I-15, SR 94, SR 125, CMH	$18
TL02[2]	2035	Transit Leap	Commuter Rail 582	Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights	I-8, I-15, SR 94, CCT	$12,660

[2] The South Bay to Sorrento (SB2S) Comprehensive Multimodal Corridor Plan is completing a more detailed ridership analysis of the Purple Commuter Rail alignment (Route 582). The analysis is studying an alignment that would include stations in City Heights and at SDSU (west campus).

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
TL22	2035	Transit Leap	*Rapid* 12 Phase 2	Spring Valley to Downtown via Southeast San Diego (full version of *Rapid*)	I-15, SR 94, SR 125, CMH	$73
TL25	2035	Transit Leap	*Rapid* 41	Fashion Valley to UTC/ UC San Diego via Linda Vista and Clairemont	I-8, CCT, CMH	$58
TL28	2035	Transit Leap	*Rapid* 120	Kearny Mesa to Downtown via Mission Valley	I-8, I-15, CCT, CMH	$109
TL35	2035	Transit Leap	*Rapid* 295	Spring Valley to Clairemont via La Mesa and Kearny Mesa	I-8, I-15, SR 94, SR 125, CCT	$91
TL43	2035	Transit Leap	*Rapid* 625	San Diego State University (SDSU) to Palomar Station via East San Diego, Southeast San Diego, National City	I-8, I-15, SR 94	$197
TL44	2035	Transit Leap	*Rapid* 630	Iris Trolley/Palomar to Kearny Mesa via I-5/ SR 163 and City College	I-8, I-15, SR 94, CCT, CMH	$36
TL46	2035	Transit Leap	*Rapid* 637	North Park to 32nd Street Trolley Station via Golden Hill	I-8, I-15, SR 94	$103
TL48	2035	Transit Leap	*Rapid* 640	San Ysidro to Central Mobility Hub via I-5 and City College	I-8, I-15, SR 94, CMH	$28
TL49	2035	Transit Leap	*Rapid* 709	H Street Trolley Station to Millennia via H Street Corridor, Southwestern College	SR 125	$99
TL53	2025	Transit Leap	*Rapid* 950 Phase 1	Otay Mesa POE to Imperial Beach via SR 905 (light version of *Rapid*)	SR 125	$6
TL58	2035	Transit Leap	Ferry	San Diego – Coronado – Military Ferry	SR 94, CMH	$—
TL59	2035	Transit Leap	*Rapid* 950 Phase 2	Otay Mesa POE to Imperial Beach via SR 905 (full version of *Rapid*)	SR 125	$22
TL03[2]	2050	Transit Leap	Commuter Rail 582	National City to U.S. Border	I-15, SR 94	$2,977
TL04	2050	Transit Leap	Commuter Rail 583	Central Mobility Hub to U.S. Border via Downtown San Diego	I-8, I-15, SR 94, CMH	$7,581

South Bay to Sorrento						
Project ID	**Year Built**	**Category**	**Project Name**	**Description**	**Connecting Corridor(s)**	**Cost ($2020) Millions**
TL13	2050	Transit Leap	LRT 510	Blue Line (San Ysidro to UTC, grade separations at Taylor/Ash)[3]	I-8, I-15, SR 94, CCT, CMH	$510
TL34	2050	Transit Leap	*Rapid* 293	Imperial Beach to Otay Ranch via Palomar Street	SR 125	$111
TL45	2050	Transit Leap	*Rapid* 635	Eastlake to Palomar Trolley via Main Street Corridor	SR 125	$116
TL47	2050	Transit Leap	*Rapid* 638	Iris Trolley to Otay Mesa via Otay, Airway Drive, SR 905 Corridor	SR 125	$91
TL57	2035	Transit Leap/Mobility Hubs	San Ysidro Mobility Hub	San Ysidro Mobility Hub	N/A	$200
TL12	2035	Transit Leap/ Goods Movement	LRT 510	Blue Line (San Ysidro to UTC, grade separations at 28th Street, 32nd Street, E Street, H Street, Palomar Street, and Blue/Orange track connections at 12th/ Imperial)[3]	I-8, I-15, SR 94, CCT, CMH	$510

Note: The Coast, Canyons, and Trails Comprehensive Multimodal Corridor Plan is completing a more detailed analysis of SR 52 between I-5 and I-805 and the connections at SR 52 and I-5. Improvements for this segment are envisioned to be within the existing corridor footprint where the MLs would be designed through repurposing the existing shoulders and landscaped median.

[3] SANDAG will conduct a Blue Line Express Feasibility and Conceptual Engineering Study as a Near-Term Implementation Action (included in Appendix B: Implementation Actions).

Transit Leap Frequency and Span of Service

Service	Route	Description	Existing Frequency (in minutes)		2025 Frequency (in minutes)		2035 Frequency (in minutes)		2050 Frequency (in minutes)		Existing Span of Service	2050 Span of Service
			Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak		
Commuter Rail	398	COASTER	36–45	120–180	30	60	20	60	20	60	5 a.m.–8:00 p.m.	4 a.m.–12 a.m.
Commuter Rail	581	581: Downtown to El Cajon via San Diego State University (SDSU) and La Mesa 581B: Central Mobility Hub to El Cajon via SDSU and La Mesa	--	--	--	--	--	--	10	10	--	4 a.m.–2 a.m.
Commuter Rail	582	2035: Sorrento Mesa to National City via University Town Center (UTC), Kearny Mesa, and City Heights 2050: Sorrento Mesa to U.S.–Mexico Border via UTC, Kearny Mesa, City Heights, and West/South Bay	--	--	--	--	10	10	10	10	--	4 a.m.–2 a.m.
Commuter Rail	583	Central Mobility Hub to U.S.–Mexico Border, via Downtown San Diego	--	--	--	--	--	--	10	10	--	4 a.m.–2 a.m.
Light Rail Transit (LRT)	399	SPRINTER (Oceanside to Escondido)	30	30	30	30	15	15	10	10	4 a.m.–9:30 p.m.	4 a.m.–2 a.m.
LRT	510	Blue Line (San Ysidro to UTC)	7.5	7.5	7.5 SY–DT 15 (DT–UTC)	7.5 SY–DT 15 (DT–UTC)	7.5	7.5	7.5	7.5	4:30 a.m.–1:30 a.m.	4 a.m.–2 a.m.
LRT	520	Orange Line (El Cajon to Downtown)	15	15	15	15	7.5	7.5	7.5	7.5	4:30 a.m.–1:30 a.m.	4 a.m.–2 a.m.
LRT	530	Green Line (Santee to Downtown)	15	15	15	15	7.5	7.5	7.5	7.5	4 a.m.–1 a.m.	4 a.m.–2 a.m.
Tram	555	Tram: Downtown to Logan Heights, Golden Hill, South Park, North Park, University Heights, Hillcrest	--	--	--	--	--	--	10	10	--	4 a.m.–2 a.m.
Airport Connection	577	Central Mobility Hub to Airport via Car Rental Lot and Harbor Island East Basin	--	--	--	--	2	2	2	2	--	24 hours
Rapid	10	La Mesa to Ocean Beach via Mid-City, Hillcrest, Central Mobility Hub	--	--	10	10	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	12	Spring Valley to Downtown via Southeast San Diego	--	--	10	10	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	28	Point Loma to Kearny Mesa via Central Mobility Hub, Linda Vista	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	30	Balboa Station to Sorrento Mesa via Pacific Beach, La Jolla, UTC	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	41	Fashion Valley to UTC/UC San Diego via Linda Vista and Clairemont	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	103	Del Mar to Sabre Springs via SR 56	--	--	--	--	--	--	10	10	--	4 a.m.–10 p.m.
Rapid	104	Sorrento Valley to Sabre Springs via SR 56	--	--	--	--	--	--	10	10	--	4 a.m.–10 p.m.
Rapid	120	Kearny Mesa to Downtown (DT) via Mission Valley/Fashion Valley (FV)	15 DT–FV 30 (FV–KM)	15 DT–FV 30 (FV–KM)	15 DT–FV 30 (FV–KM)	15 DT–FV 30 (FV–KM)	10	10	10	10	5 a.m.–11:30 p.m.	4 a.m.–12 a.m.
Rapid	201	SuperLoop *Rapid*	10	10	10	10	10	10	10	10	6 a.m.–12 a.m.	4 a.m.–12 a.m.
Rapid	202	SuperLoop *Rapid*	10	10	10	10	10	10	10	10	5:30 a.m.–10:30 p.m.	4 a.m.–12 a.m.
Rapid	204	SuperLoop *Rapid*	30	30	30	30	10	10	10	10	6 a.m.–10 p.m.	4 a.m.–12 a.m.
Rapid	215	SDSU–Downtown via El Cajon Boulevard	10	15	10	10	10	10	10	10	4:30 a.m.–2 a.m.	4 a.m.–12 a.m.
Rapid	225	South Bay *Rapid*	15	30	15	30	10	10	10	10	4:30 a.m.–12 a.m.	4 a.m.–12 a.m.
Rapid	235	Escondido to Downtown San Diego via I-15	15	15	10	10	10	10	10	10	4:30 a.m.–12 a.m.	4 a.m.–12 a.m.
Rapid	237	UC San Diego to Rancho Bernardo via Sorrento Valley and Mira Mesa	15	--	15	--	10	10	10	10	6 a.m.–8:30 p.m.	4 a.m.–10 p.m.
Rapid	238	UC San Diego to Rancho Bernardo via Sorrento Valley and Carroll Canyon	--	--	--	--	10	10	10	10	--	4 a.m.–10 p.m.

Transit Leap Frequency and Span of Service

Service	Route	Description	Existing Frequency (in minutes)		2025 Frequency (in minutes)		2035 Frequency (in minutes)		2050 Frequency (in minutes)		Existing Span of Service	2050 Span of Service
			Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak		
Rapid	280	Downtown San Diego–Escondido	30 pk dir	--	10	30	10	30	10	30	5 a.m.–9 p.m.	4 a.m.–10 p.m.
Rapid	290	Downtown San Diego–Rancho Bernardo Transit Station	30 pk dir	--	10	30	10	30	10	30	5 a.m.–9 p.m.	4 a.m.–10 p.m.
Rapid	292	Pacific Beach to Otay Mesa via Kearny Mesa, El Cajon, Jamacha, and Otay Lakes	--	--	10	10	10	10	10	10	--	4 a.m.–2 a.m.
Rapid	293	Imperial Beach to Otay Ranch via Palomar Street (Upgrade South Bay Rapid to High Speed *Rapid*)	--	--	--	--	--	--	10	10	--	4 a.m.–10 p.m.
Rapid	295	Spring Valley to Clairemont via La Mesa and Kearny Mesa	--	--	--	--	10	10	10	10	--	4 a.m.–10 p.m.
Rapid	350	Escondido *Rapid*	10 pk dir	15	10	10	10	10	10	10	4:30 a.m.–11 p.m.	4 a.m.–12 a.m.
Rapid	440	Carlsbad to Escondido Transit Center via Palomar Airport Road	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	450	Oceanside to Escondido via Palomar Airport Road and SR 78	--	--	10	10	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	471	Downtown Escondido to East Escondido	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	473	Oceanside to Solana Beach to UTC/UC San Diego via Highway 101 Coastal Communities, Carmel Valley	--	--	--	--	10	10	10	10	--	4 a.m.–2 a.m.
Rapid	474	Oceanside to Vista via Mission Avenue/Santa Fe Road Corridor	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	477	Carlsbad Village to SR 76 via College Boulevard, Plaza Camino Real	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	625	SDSU to Palomar Station via East San Diego, Southeast San Diego, National City	--	--	--	--	10	10	10	10	--	4 a.m.–12 a.m.
Rapid	630	Iris Trolley/Palomar to Kearny Mesa via I-5/SR 163 and City College	--	--	--	--	10	10	See Route 583	See Route 583	--	4 a.m.–10 p.m.
Rapid	635	Eastlake to Palomar Trolley via Main Street Corridor	--	--	--	--	--	--	10	10	--	4 a.m.–10 p.m.
Rapid	637	North Park to 32nd Street Trolley Station via Golden Hill	--	--	--	--	10	10	10	10	--	4 a.m.–2 a.m.
Rapid	638	Iris Trolley to Otay Mesa via Otay, Airway Drive, SR 905 Corridor	--	--	--	--	--	--	10	10	--	4 a.m.–10 p.m.
Rapid	640	San Ysidro to Central Mobility Hub via I-5 and City College	--	--	--	--	10	10	See Route 583	See Route 583	--	4 a.m.–10 p.m.
Rapid	709	H Street Trolley Station to Millennia via H Street Corridor, Southwestern College	--	--	--	--	10	10	10	10	6 a.m.–11 p.m.	4 a.m.–12 a.m.
Rapid	870	El Cajon to UTC via Santee, SR 52, I-805	--	--	--	--	10	30	10	30	--	4 a.m.–10 p.m.
Rapid	890	El Cajon to Sorrento Mesa via Santee, SR 52, I-805	--	--	--	--	10	30	10	30	--	4 a.m.–10 p.m.
Rapid	910	Coronado to Downtown via Coronado Bridge	--	--	--	--	10	10	10	10	--	4 a.m.–2 a.m.
Rapid	950	Otay Mesa Port of Entry to Imperial Beach via SR 905	10	30	10	10	10	10	10	10	4:30 a.m.–12:30 a.m.	4 a.m.–2 a.m.
Express Bus	20	Kearny Mesa to Rancho Bernardo	15	30	15	30	15	30	15	30	5 a.m.–10:30 p.m.	4 a.m.–12 a.m.
Express Bus	50	Downtown to UTC	30	120–180	--	--	--	--	--	--	5:30 a.m.–7 p.m.	--
Express Bus	60	Euclid Transit Center – UTC	30	--	30	--	X	X	X	X	5 a.m.–8 p.m.	5 a.m.–7 p.m.

Transit Leap Frequency and Span of Service

Service	Route	Description	Existing Frequency (in minutes)		2025 Frequency (in minutes)		2035 Frequency (in minutes)		2050 Frequency (in minutes)		Existing Span of Service	2050 Span of Service
			Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak		
Local Bus	972	Sorrento Mesa Coaster Connection	45	--	30	60	20	60	20	60	7 a.m.–5 p.m.	4 a.m.–12 a.m.
Local Bus	973	Carroll Canyon Coaster Connection	45	--	30	60	20	60	20	60	7 a.m.–5 p.m.	4 a.m.–12 a.m.
Local Bus	974	UC San Diego Coaster Connection	45	--	30	60	20	60	20	60	7 a.m.–5 p.m.	4 a.m.–12 a.m.
Local Bus	978	Torrey Pines Coaster Connection	45	--	30	60	20	60	20	60	7 a.m.–5 p.m.	4 a.m.–12 a.m.
Local Bus	979	North University City Coaster Connection	45	--	30	60	20	60	20	60	7 a.m.–5 p.m.	4 a.m.–12 a.m.
Local Bus	984	Hillary Transit Center to SV via Carroll Canyon/Miramar Road Business Parks	--	--	--	--	20	60	20	60	--	4 a.m.–12 a.m.
Local Bus	985	UC San Diego to Torrey Pines Shuttle	--	--	15	--	10	--	10	--	--	4 a.m.–12 a.m.
Local Bus	992	Airport/Downtown Shuttle	15	15	10	10	10	10	10	10	5 a.m.–12:30 a.m.	4 a.m.–12 a.m.
Local Bus	993	Shelter Island to Convention Center Shuttle	--	--	--	--	--	--	10	10	--	4 a.m.–12 a.m.

Appendix U:
Cost Estimation Methodology

Final

December 2021

Table of Contents

Table of Tables

Appendix U:
Cost Estimation Methodology

How SANDAG Estimated Costs for a Bold, 21st-Century Transportation System

Our transformative vision for a 21st-century transportation system would enhance mobility for people across the San Diego region, support economic growth, help us achieve important goals for reducing greenhouse gas emissions and protecting the environment, and improve social equity.

The San Diego Association of Governments (SANDAG) worked with national experts, Caltrans, Metropolitan Transit System (MTS), North County Transit District (NCTD), the County of San Diego, and local jurisdictions to estimate how much San Diego Forward: The 2021 Regional Plan's (2021 Regional Plan) vision would cost. This appendix summarizes how these partners developed cost estimates for major aspects of the 2021 Regional Plan's vision.

The total estimated cost for the 2021 Regional Plan is $162.5 billion in 2020 dollars.

The 5 Big Moves

To best communicate what the 2021 Regional Plan vision would cost, this appendix organizes cost estimates according to five overarching strategies that define the 2021 Regional Plan. These strategies are known as the 5 Big Moves. Together, they completely reimagine how people and goods can move throughout San Diego County in the 21st century. These strategies, discussed below along with the cost estimates attached to each, are Complete Corridors, Transit Leap, Mobility Hubs, Flexible Fleets, and the Next Operating System (Next OS).

Pursuing the 5 Big Moves would require innovative new investments in the regional transportation network to enhance connectivity, increase safety and sustainability, and improve the everyday lives of millions of people. The vision for the 2021 Regional Plan, which synchronizes the 5 Big Moves so that the success of one depends on the success of the others, would add tremendous capacity to the transportation system and offer people compelling alternatives to driving alone. The ultimate goal is a fully integrated, world-class transportation system.

It is important to recognize that the cost for realizing one of the 5 Big Moves does not take away from producing another one of the 5 Big Moves. On the contrary, investments in each of the 5 Big Moves ensure the success of the others. The overall vision for success in the 2021 Regional Plan is a vision that unifies the 5 Big Moves into a coherent whole.

Complete Corridors

Complete Corridors provide a variety of travel choices and use technology to manage how highways and major roads are used in real time. They provide a balance of dedicated, safe space for everyone, including freight vehicles and people who walk, bike, drive, ride transit, and use Flexible Fleets. In this sense, the success of Complete Corridors is closely aligned with the success of the other 5 Big Move initiatives: Transit Leap, Flexible Fleets, Mobility Hubs, and Next OS.

Achieving Complete Corridors would require several major initiatives along our region's highways and major roads, which are outlined below:

- Maximizing Space on Our Highways
  - Converting General-Purpose Lanes to Managed Lanes
  - Converting Shoulders to Managed Lanes
  - Selective Widening
  - Connectors and Access Ramps
- Highway Operations and Maintenance
- Active Transportation Demand Management and Smart Intersection System Improvements
- Goods Movement
- Rural Corridors
  - Curve Straightening
  - Intersection Improvements
  - Shoulder Widening
  - Other Facility Improvements

The effort to enhance mobility must address the region's highway network. Making this network more efficient means maximizing space on highways for travelers. The 2021 Regional Plan envisions tackling this challenge in three main ways. First, the 2021 Regional Plan creates a system of Managed Lanes, in which general-purpose lanes are converted—in certain places and at certain times—into lanes that are open for particular users. These users may include *Rapid* transit vehicles and other public transportation services enabled by Transit Leap, people who carpool, and rideshare services such as Uber and Lyft. Second, the 2021 Regional Plan converts shoulders on highways, where it is safe to do so, into Managed Lanes. Third, the 2021 Regional Plan identifies a limited number of places around the region where stretches of highway are physically widened—but only where absolutely necessary.

SANDAG has estimated the costs associated with maximizing space on our highways using standard Caltrans worksheets. The costs are based on standard Caltrans bid items, with average historical unit costs for Caltrans District 11 (San Diego County and Imperial County).[1] The cost of improvements along general roadway sections is estimated based on the type (at grade, retained, on structure) and the scope (one lane, two lanes, etc.) of such improvements. These costs are broken down by mile for each type of roadway in a given project.

Per-mile cost analyses consider the following:

- Earthwork
- Pavement Structure
- Drainage
- Specialty Items
- Environmental
- Traffic Items
- Detours
- Roadway Mobilization
- Supplemental Work
- Structures (bridges, overpasses, etc.)
- Right-of-Way
- Support Costs
- Contingency

The costs developed for each category of highway improvements are as follows:

- Managed Lanes:
    - Converting general-purpose lanes into Managed Lanes: $10.8 million per mile
    - Converting shoulders into Managed Lanes or selective widening: $40.2 million per mile
        - **Total cost: $7.706 billion ($2020)**
- Managed Lane Connectors: $198 million (average per location)
    - **Total cost: $7.806 billion ($2020)**

[1] From "2021 Regional Plan 11 Page Estimate – GP+Shoulder Lanes Conversion2019_12_30" and "2021 Regional Plan – 11 Page Estimate – Lane Conversion 2019_12_11." 11-page estimates based on collaboration with Caltrans District 11 planning staff in 2019 and 2020 to develop specific unit costs for general purpose lane conversions (December 11, 2019) and shoulder lane conversions (December 30, 2019). Main line typical cross sections also developed for general purpose and shoulder lane conversions per the 11-page estimates.

- Connectors and Access Ramps:
    - Interchange and Arterial Operational Improvements: $379 million (average per location)
        - **Total cost: $0.895 billion ($2020)**
    - Direct Access Ramps and Transit Operational Improvements: $48.8 million (average per location)
        - **Total cost: $0.320 billion ($2020)**
- Airport Connectivity
    - **Total cost: $0.836 billion ($2020)**

Highway Operations and Maintenance

Maintaining our region's highway system and making sure it operates efficiently every day is vital to personal mobility, the health of our regional economy, and meeting our state mandates for reducing greenhouse gas emissions. Therefore, the costs associated with maintaining and operating our highway system are included in the 2021 Regional Plan, and they have been informed by the State Highway Operations and Protection Program estimates for the San Diego region.[2]

- **Total cost: $12.330 billion ($2020)**

Active Transportation Demand Management and Smart Intersection Systems

As part of the San Diego Regional Transportation System Management and Operations Plan, a sketch-level estimate was completed of Active Transportation Demand Management elements for enhanced traffic management on corridors throughout the San Diego region. Unit prices for freeway, urban arterial, and rural arterial management system elements (also known as Intelligent Transportation System elements) are estimated based on recent projects with similar scopes of work. These include the I-805/SR 94 Bus on Shoulder project; I-15 and I-80 Integrated Corridor Mobility (ICM) projects; I-880 Express Lane; and I-680 Express Lane and Backhaul. We have also considered recently completed planning-level projects. These include the Caltrans District 10 2019 ICM Plan, the 2019 Metropolitan Transportation Commission Regional Communications Plan, and the Sacramento Area Council of Governments 2019 Smart Region Future Technology Plan.[3]

- **Total cost: $4.774 billion ($2020)**

---

[2] Based on SANDAG revenue estimates described in Appendix V: Funding and Revenues. The details for each fund type can be found in the "Regional Plan Revenue - Final" file developed for the 2021 Regional Plan (December 10, 2021).

[3] From "2021 Regional Plan – CC SIS ATDM Costing - Technical Memorandum – Support Information for ATDM Cost Estimating" (November 1, 2019).

Goods Movement

The smooth transport of goods into and out of our region—and the delivery of goods to cities and communities within it—fuels our economy and contributes to a high standard of living. SANDAG developed goods movement projects and their cost estimates with Caltrans, and in close collaboration with the Port of San Diego, San Diego County Regional Airport Authority, and various agencies that operate or support goods movement corridors and facilities.[4] These goods movement projects focus on our region's roadways, railroads, seaports, airports, land ports of entry, and pipelines—as well as the relevant software to make this goods movement network function efficiently. Many goods movement projects share infrastructure and benefits with each of the 5 Big Moves. For example, some of the roadways used to move goods are targeted for improvements under the Complete Corridors initiative. Rail projects benefitting goods movement are targeted under Transit Leap. Also, the systems and software included in Next OS projects benefit goods movement. Therefore, many of the costs for projects that support goods movement are reflected in the costs for each of the 5 Big Moves.

- **Total cost: $0.489 billion ($2020)**

Rural Corridors

Improvement costs for rural travel corridors were based on costs detailed in the Intraregional Tribal Transportation Study.[5] These were initially developed using the County of San Diego's unit price list for construction projects and when applicable, along with any cost information included in the 2019 Federal Regional Transportation Plan. Additionally, construction costs assumed in the County of San Diego Transportation Impact Fee Transportation Needs Assessment Report (September 2012) and typical unit costs were developed and used for similar projects based on the length of project, the number of intersections, or road type. These typical unit costs were then applied to the applicable projects identified for the rural corridors.

- **Total cost: $1.538 billion ($2020)**

Adopted Regional Bike Network

The Regional Bike Network in the 2021 Regional Plan goes beyond biking and represents a significant increase in investment in safety and mobility for people who travel the region by foot, bike, scooter, transit, or other means outside of a car. While the 2021 Regional Plan maintains the adopted network from the 2010 Regional Bike Plan,[6] the costs for each of the projects have been reassessed to reflect the level of investment to make the network comfortable for users of all ages and abilities. This presents itself as infrastructure improvements to either separate motorized and nonmotorized modes, or

---

4 From "2021 Regional Plan Appendix U Annual Costing_2020 and YOE" Excel workbook developed for the 2021 Regional Plan (December 10, 2021).

5 From the 2018 Intraregional Tribal Transportation Strategy which includes the rural corridor cost estimates (available at sandag.org/itts). The rural corridor cost estimates are also included in the cumulative Complete Corridors project costs estimated and summarized in the "2021 Regional Plan CC Cost Estimation 4-3-2020" Excel workbook.

6 The 2010 Regional Bike Plan can be found at sandag.org/uploads/projectid/projectid_353_10862.pdf.

lower speeds and volumes to a level considered safe for mixing traffic modes. Building the network in this way creates an inviting environment for people who are interested in walking, biking, and other forms of micromobility but who may not have felt safe trying those forms of transportation. Current and historic SANDAG bikeway projects were used to provide a basis for comparison for cost because the level of investment is similar.

Further discussion regarding the improved safety and comfort of the network is included in Appendix L: Active Transportation.

- **Total cost: $2.929 billion ($2020)**

Complete Corridors subtotal: $39.625 billion ($2020)

Transit Leap

Transit Leap would create a complete network of high-speed, high-capacity, high-frequency transit services that connect major residential areas with employment centers and attractions throughout the San Diego region. Transit Leap would include new high-speed services that cover longer distances with limited stops, and these services would be separated from vehicle traffic with bridges, tunnels, or dedicated lanes. Transit Leap would also include improvements to existing transit services such as the Trolley, COASTER, SPRINTER, and *Rapid*. These improvements could include additional rail tracks, more frequent service, dedicated transit lanes, and traffic signal priority to keep transit moving quickly.

Overall, Transit Leap services would connect to—and rely on—supporting infrastructure for Complete Corridors, Mobility Hubs, Flexible Fleets, and Next OS.

Estimating costs for Transit Leap took into consideration development options for new commuter rail, light rail/Trolley, and *Rapid* improvements to existing transit services. Costs were developed using the Federal Transit Administration Capital Cost Database, which is intended for developing order-of-magnitude cost estimates for conceptual transit projects. The cost models are automatically adjusted to account for differences in regional cost levels between locations. The unit costs generated from the Capital Cost Database were compared with known actual project costs for the San Diego region, and they were adjusted as necessary. Capital transit projects include cost estimates for construction (both station and segment per mile), right-of-way acquisition, and other non-construction "soft" costs such as environmental review, planning, and design.[7] The transit capital costs also include the costs of vehicles through the 30-year timeline of the 2021 Regional Plan.

[7] From the "2021 Regional Plan Transit Capital Costing Tier 1 Routes," "2021 Regional Plan Transit Capital Costing Tier 2 Routes," and "2021 Regional Plan Transit Capital Costing Tier 3 Routes" Excel workbooks developed for the 2021 Regional Plan (March 2020).

Some examples of transit unit costs, for reference, are:

- Guideway and track elements (at grade, below grade, or above grade)
- Stations, stops, terminals, and intermodals
- Support/maintenance facilities, yards, shops, and administration buildings
- Sitework and special conditions
- Systems

The Transit Leap capital cost assumptions included in the 2021 Regional Plan are:

- **Total cost: $49.507 billion ($2020)**

The Transit Leap vehicle cost assumptions for the horizon year of the 2021 Regional Plan (2021–2050) are:

- **Total cost: $4.282 billion ($2020)**

Operations and Maintenance costs for the life of the 2021 Regional Plan (2021–2050) are estimated based on outputs of operating hours multiplied by the operating costs per hour for each mode of transit. The operating hours are estimated using outputs from the activity-based travel model while operating costs are estimated using current data from MTS and NCTD.[8]

- **Total cost: $22.963 billion ($2020)**

Fare subsidies that would reduce the cost of transit fares are also included in the operating costs. These subsidies, starting in 2027, would reduce fares for either all riders or various groups of riders like seniors, youth, or low-income riders.

- **Total cost: $4.676 billion ($2020)**

Transit Leap subtotal: $81.427 billion ($2020)

Mobility Hubs

Mobility Hubs are communities with a high concentration of people, destinations, and travel choices. They offer on-demand travel options and supporting infrastructure that enhance connections to high-quality Transit Leap services while helping people safely make short trips around the community on Flexible Fleets. Mobility Hubs can span one, two, or a few miles based on community characteristics and are uniquely designed to fulfill a variety of travel needs while strengthening sense of place.

[8] From the "2021 Regional Plan Transit Operations Costing" Excel workbook developed for the 2021 Regional Plan (December 14, 2020).

Various Mobility Hub amenities improve the user experience while accessing Transit Leap or Flexible Fleets. Additionally, traffic-calming measures make it safer to walk, bike, or use other micromobility options on neighborhood streets. Estimating the cost of Mobility Hubs included consideration of the following amenities and improvements:

- **Electric vehicle charging infrastructure** distributed throughout Mobility Hubs helps ensure Flexible Fleets such as on-demand shuttles remain charged for the duration of their operating period.
- **Micromobility charging and secure parking** provides people with convenient ways to store personally owned bikes, scooters, and other rideables near transit stations and alongside safe bikeways. Visible corrals for dockless micromobility are also included.
- **Interactive travel kiosks** equipped with WiFi could be sited at transit stations and throughout a Mobility Hub to offer convenient, real-time trip planning and Flexible Fleet booking options.
- **Passenger loading zones** provide space for the safe pick-up and drop-off of people using pooled rideshare, microtransit, and other on-demand Flexible Fleets.
- **Parcel delivery lockers** offer transit riders and other Mobility Hub users a convenient way to pick up or ship a small package without using a personal vehicle.
- **Shared mobility parking** for services like carshare help ensure these options for temporarily using a vehicle for errands are visible, safe, and easily accessible by people of all ages and abilities.
- **Complete streets improvements** within Mobility Hubs such as pedestrian, micromobility, and other traffic-calming treatments help complement the Adopted Regional Bike Network.

Estimated costs were developed using a mix of current average industry costs and research from similar projects in North America deploying these amenities and supporting technologies. Estimates account for equipment, construction, engineering, design, and associated project management costs typically related to deploying these technology-driven amenities.[9,10] The cost estimates were applied across the regional Mobility Hub network, including the proposed Central Mobility Hub[11] and other potential land acquisition costs, to derive the overall cost estimate. Complete streets estimates for each Mobility Hub derived from a base cost per mile.[12,13]

---

9 From "2021 Regional Plan Mobility Hub and Flexible Fleets Costing" Excel workbook developed for the 2021 Regional Plan (May 20, 2020).

10 From "2021 Regional Plan Mobility Hub Amenities Costing Outline" document developed for the 2021 Regional Plan (March 25, 2020).

11 From "2021 Regional Plan Central Mobility Hub Costing" Excel workbook developed for the 2021 Regional Plan (October 8, 2020).

12 From "2021 Regional Plan Bike Program Historic Costs" Excel workbook developed for the 2021 Regional Plan (March 21, 2021).

13 From "2021 Regional Plan Bikeway Cost per Mile" Excel workbook developed for the 2021 Regional Plan (March 26, 2020).

Mobility Hub Amenities:

- **Total cost: $0.683 billion ($2020)**

Central Mobility Hub and Other Land Acquisitions:

- **Total cost: $2.486 billion ($2020)**

Complete Streets Improvements:

- **Total cost: $2.476 billion ($2020)**

Mobility Hubs subtotal: $5.645 billion ($2020)

Flexible Fleets Operations

Flexible Fleets are shared, on-demand transportation services that provide convenient and personalized travel options, including a broad set of services from on-demand rideshare and bikeshare to neighborhood shuttles and delivery services. These fleets provide services for all types of trips—24 hours a day, 7 days a week—which can reduce the need to own a car. They also provide important connections between high-speed Transit Leap services and key destinations such as work or home, making it easier for commuters to choose transit. Flexible Fleets are primarily accessible through mobile apps, and they can be operated by public and private agencies or through partnerships.

Flexible Fleet operations are estimated based on a public-private partnership model in which public agencies may partner or contract services directly with the Flexible Fleet providers. Estimating the cost of Flexible Fleets included the following:

- Average operating costs for shared micromobility, microtransit, and neighborhood electric vehicle shuttles. This includes costs associated with purchasing or leasing vehicles, vehicle maintenance, and software licensing fees.
- Operating service assumptions for shared micromobility, microtransit, and neighborhood electric vehicle shuttle services. This includes the estimated fleet vehicles, anticipated service hours and service days.

The Flexible Fleet operating costs were developed using publicly available data from Flexible Fleet pilots conducted in North America in the last several years including locally operated services like the Carlsbad Connector, FRED, and shared micromobility.[14]

Costs associated with commuter rideshare services such as SANDAG Vanpool Program subsidies and incentives for carpool are reflected in the Supporting Policies and Programs section. The capital cost of infrastructure improvements and amenities that are

[14] From "2021 Regional Plan Mobility Hub and Flexible Fleets Costing" Excel workbook developed for the 2021 Regional Plan (April 14, 2020).

needed to support Flexible Fleet services like parcel delivery lockers, shared mobility parking, and complete streets improvements are reflected in the Complete Corridors and Mobility Hubs sections. Costs associated with data sharing and integration of Flexible Fleet services with existing trip planning tools are reflected in the Next OS estimates.[15]

Flexible Fleet Operations subtotal: $1.792 billion ($2020)

Next OS Elements

Next OS is the "brain" of the entire transportation system. It is a digital platform that compiles information from sources like passenger vehicles, buses, ridesharing vehicles, delivery trucks, e-bikes, and scooters into a centralized data hub. Analysis of this data will improve how transportation is planned, operated, and experienced. Transportation operators will be able to better manage supply and demand by modifying how infrastructure and services are used throughout the day. The result will be a modernized transportation system with roads and transit services that operate smoothly and serve people better.

Because Next OS is the "brain" of the entire transportation system, it includes a wide variety of technological components that ensure the fast, efficient, and timely delivery of services in the transportation system. The cost estimate for Next OS includes the cost of gathering data, managing that data with systems and software, and operations.

The data hub is a critical piece of the system, and it provides a digital platform that can analyze transportation data in real time to make transportation more integrated, efficient, and most of all, more responsive to people's immediate needs.

Costs for Next OS include data hub development, development of applications to support six key use cases, and operations. Data hub and application development estimates include software and licensing, cloud, data warehousing, and acquiring third-party data. On-going costs are estimated on an annual basis. Cost estimates also include major and minor system refreshes.[16]

The six Next OS use cases that served as the basis for the cost estimates are: Mobility as a Service, Next Generation of the Integrated Corridor Management System, Regional Border Management System, Curb Management System, Transit Optimization, and a regional Smart Intersection System.

Next OS subtotal: $0.232 billion ($2020)

---

15 See "2021 Regional Plan Mobility Hub and Flexible Fleets Costing" Excel workbook developed for the 2021 Regional Plan (May 20, 2020); "Next OS Estimate R7" Excel workbook developed for the 2021 Regional Plan (April 14, 2020); and "Technical Memorandum – Support Information for ATDM Cost Estimating" Complete Corridor cost Excel workbook (November 1, 2019).

16 From "2021 Regional Plan - Next OS Costs Estimate" Excel workbook developed for the 2021 Regional Plan (December 10, 2021).

Supporting Policies and Programs

Programs that manage demands on the regional transportation system would be broadened with the deployment of the 5 Big Moves under the 2021 Regional Plan. These Transportation Demand Management (TDM) programs would include a much larger array of mobility services and supporting programs for commuters and employers, such as the SANDAG Vanpool Program, iCommute employer services, telework resources, and incentives for taking transit and carpooling. The cost estimate for these programs is based on prior historical program costs, outputs from TDM off-model calculators, and funding eligibility.

The vision presented in the 2021 Regional Plan recognizes the close relationship between the transportation system and how land is used in our region. As a result, the vision supports close connections between projects outlined in the 2021 Regional Plan and regional programs which benefit the environment, support how land is used, promote innovative approaches to transportation solutions, and promote safety. These new and existing programs address habitat conservation, sustainability and climate change targets, social equity considerations, and safety goals, all requirements of the Regional Plan. Assumptions and current cost estimates are based on projections of available funding. Appendix B: Implementation Actions includes additional information on each policy and program area. Table U.1 provides the breakdown of the program assumptions.

Table U.1: Program Assumptions

Program Assumptions	
Program Categories	**$M ($2020)**
Land Use and Habitat	$2,622
Climate Action Planning	$438
Climate Adaptation and Resilience	$868
Housing	$2,630
Transportation Demand Management Grants	$548
Zero-Emission Vehicles and Infrastructure	$2,010
Vision Zero	$425
Parking Management	$148

Supporting Policies and Programs subtotal: $9.689 billion ($2020)

Local Projects

Other plan costs include local streets and roads, local bike programs, and debt service. These costs will be further refined as the 2021 Regional Plan is developed.

Local Streets and Roads:

- **Total cost: $14.393 billion ($2020)**

Local Bike Projects:

- **Total cost: $1.430 billion ($2020)**

Local Projects subtotal: $15.823 billion ($2020)[17]

Debt Service subtotal: $8.304 billion ($2020)[18]

Total Regional Plan Vision estimated cost: $162.538 billion ($2020)

Tables U.2 and U.3 summarize the transportation expenditures included in the investment plan in both 2020 and escalated (year-of-expenditure) dollars, respectively. Escalated dollars estimate the future costs of projects during the period they would be constructed.[19]

[17] Based on SANDAG revenue estimates described in Appendix V: Funding and Revenues. The details for each fund type can be found in the "Regional Plan Revenue - Final" file developed for the 2021 Regional Plan (December 10, 2021).

[18] Based on SANDAG revenue estimates described in Appendix V: Funding and Revenues. The details for each fund type can be found in the "Regional Plan Revenue - Final" file developed for the 2021 Regional Plan (December 10, 2021).

[19] Escalation rate of 1.93% annually applied (starting in 2021) from the ten-year moving average Engineering News Record Los Angeles Construction Cost Index.

Table U.2: Major Estimated Expenditures by Mode (in millions of 2020 dollars)

Major Estimated Expenditures by Mode (in millions of 2020 dollars)					
Expenditure Category	**Subcategory**	**FY 2021–2025**	**FY 2026–2035**	**FY 2036–2050**	**Total**
Complete Corridors	Managed Lanes	$766	$3,969	$2,971	$7,706
	Managed Lane Connectors	$73	$4,355	$3,378	$7,806
	Interchange and Arterial Operational Improvements	$137	$379	$379	$895
	Direct Access Ramps and Transit Operational Improvements	$4	$184	$132	$320
	Airport Connectivity	$0	$836	$0	$836
	Highway Operations and Maintenance	$1,747	$4,110	$6,473	$12,330
	Active Transportation Demand Management/Smart Intersection Systems	$681	$2,865	$1,228	$4,774
	Goods Movement	$110	$137	$242	$489
	Rural Corridors	$0	$289	$1,248	$1,538
	Adopted Regional Bike Network	$135	$792	$2,003	$2,929
	SUBTOTAL	**$3,654**	**$17,917**	**$18,055**	**$39,625**
Transit Leap	Capital	$1,542	$21,786	$26,179	$49,507
	Vehicles	$466	$1,274	$2,541	$4,282
	Operations	$2,551	$6,636	$13,776	$22,963
	Transit Fare Subsidies	$0	$752	$3,923	$4,676
	SUBTOTAL	**$4,559**	**$30,449**	**$46,419**	**$81,427**
Mobility Hubs	Mobility Hub Amenities	$152	$247	$285	$683
	Central Mobility Hub and Other Land Acquisitions	$0	$2,486	$0	$2,486
	Complete Streets Improvements	$0	$1,857	$619	$2,476
	SUBTOTAL	**$152**	**$4,590**	**$904**	**$5,645**

Major Estimated Expenditures by Mode (in millions of 2020 dollars)					
Expenditure Category	**Subcategory**	**FY 2021–2025**	**FY 2026–2035**	**FY 2036–2050**	**Total**
Flexible Fleets	Flexible Fleet Operations	**$161**	**$538**	**$1,094**	**$1,792**
Next OS	Next OS Elements	**$58**	**$61**	**$113**	**$232**
Programs	Supporting Policies and Programs	**$1,360**	**$4,434**	**$3,894**	**$9,689**
Local Projects	Local Streets and Roads	$2,041	$4,821	$7,531	$14,393
	Local Bike Projects	$238	$477	$715	$1,430
	SUBTOTAL	**$2,279**	**$5,298**	**$8,246**	**$15,823**
Debt Service	Debt Service	**$1,538**	**$3,087**	**$3,679**	**$8,304**
	GRAND TOTAL	**$13,761**	**$66,373**	**$82,404**	**$162,538**

Totals may not add up due to rounding

Table U.3: Major Estimated Expenditures by Mode (in millions of escalated dollars)

Major Estimated Expenditures by Mode (in millions of escalated dollars)					
Expenditure Category	**Subcategory**	**FY 2021–2025**	**FY 2026–2035**	**FY 2036–2050**	**Total**
Complete Corridors	Managed Lanes	$827	$4,849	$4,698	$10,374
	Managed Lane Connectors	$79	$5,569	$5,302	$10,951
	Interchange and Arterial Operational Improvements	$147	$494	$554	$1,195
	Direct Access Ramps and Transit Operational Improvements	$4	$224	$214	$442
	Airport Connectivity	$0	$1,089	$0	$1,089
	Highway Operations and Maintenance	$1,851	$5,031	$10,082	$16,964
	Active Transportation Demand Management/Smart Intersection Systems	$733	$3,731	$2,130	$6,594
	Goods Movement	$117	$168	$377	$662
	Rural Corridors	$0	$377	$2,166	$2,542
	Adopted Regional Bike Network	$143	$969	$3,119	$4,231
	SUBTOTAL	**$3,901**	**$22,501**	**$28,641**	**$55,043**
Transit Leap	Capital	$1,662	$27,329	$40,461	$69,451
	Vehicles	$494	$1,560	$3,958	$6,012
	Operations	$2,703	$8,123	$21,456	$32,282
	Transit Fare Subsidies	$0	$947	$6,110	$7,058
	SUBTOTAL	**$4,858**	**$37,959**	**$71,985**	**$114,803**
Mobility Hubs	Mobility Hub Amenities	$161	$302	$444	$907
	Central Mobility Hub and Other Land Acquisitions	$0	$3,043	$0	$3,043
	Complete Streets Improvements	$0	$2,273	$964	$3,237
	SUBTOTAL	**$161**	**$5,618**	**$1,408**	**$7,187**

Flexible Fleets	Flexible Fleet Operations	**$170**	**$658**	**$1,703**	**$2,532**
Next OS	Next OS Elements	**$60**	**$75**	**$169**	**$303**
Programs	Supporting Policies and Programs	**$1,441**	**$5,428**	**$6,065**	**$12,934**
Local Projects	Local Streets and Roads	$2,162	$5,902	$11,729	$19,793
	Local Bike Projects	$252	$583	$1,113	$1,949
	SUBTOTAL	**$2,415**	**$6,485**	**$12,843**	**$21,743**
Debt Service	Debt Service	**$1,616**	**$3,802**	**$5,536**	**$10,954**
	GRAND TOTAL	**$14,621**	**$82,527**	**$128,351**	**$225,499**

Totals may not add up due to rounding

Appendix V:
Funding and Revenues

Final

December 2021

Table of Contents

Table of Figures

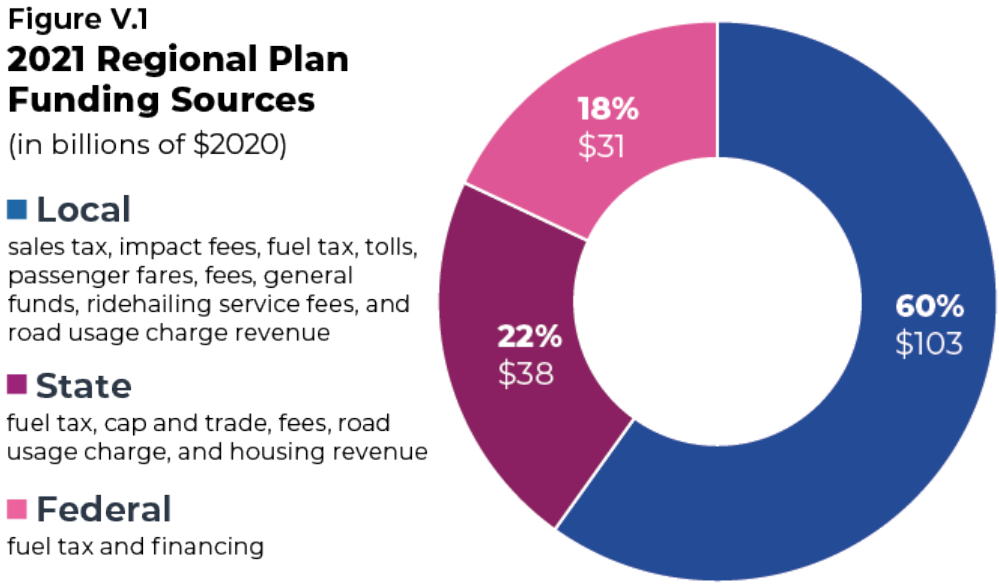
Table of Tables

Appendix V:
Funding and Revenues

The purpose of this appendix is to explain the anticipated revenues to fund San Diego Forward: The 2021 Regional Plan (2021 Regional Plan) projects, programs, and services. The revenue sources are broken down by local, state, federal, and others.

The region continues to rely heavily on local sources of revenue. Roughly 60% of the plan is funded with local revenue streams which can be structured and implemented to be a critical tool used to advance regional environmental, economic, and equity goals. Local revenue streams also provide opportunity and flexibility to compete for federal and state competitive funding that requires a local contribution or match.

Figure V.1: 2021 Regional Plan Funding Sources



Despite state fuel tax increases established by California Senate Bill 1 (Beall, 2017) (SB 1), the Road Repair and Accountability Act of 2017, state and federal fuel taxes are not able to keep pace with increasing transportation costs and the impacts of increasing fuel efficiency on traditional revenue sources. A detailed explanation of the new sources of revenue assumed in the 2021 Regional Plan is provided beginning on page V-18 of this appendix.

The total revenue identified from potential revenue sources in this appendix exceeds the total cost estimates presented in Appendix U: Cost Estimation Methodology. The revenue sources reflect best estimates of what may reasonably be collected from various sources. Some of the sources require state or federal legislation to pass before going into effect; others require voter approval. SANDAG is committing to seeking new local funding in

addition to pursuing state and federal funding opportunities as part of the suite of implementation activities identified in Appendix B: Implementation Actions of the 2021 Regional Plan. Where new funding sources are assumed, the starting dates of those sources are shown as the "base year." For existing revenue sources that are assumed to continue, those "base year" assumptions are 2020.

Consistency with Other Federal, State, and Local Documents

The 2021 Regional Plan is consistent with other federal, state, and local documents including the 2020 Interregional Transportation Improvement Program and the 2020 Federal Transportation Improvement Program (FTIP). Funding strategies that implement Transportation Control Measures are included in the 2020 FTIP.

Anticipated Revenues

All revenues shown below in the fund source descriptions are displayed in constant, 2020 dollars ($2020). In addition, revenues have also been escalated to nominal dollars based on escalation factors appropriate for the specific revenue source. Tables V.4 and V.5 provided at the end of this appendix reflect the assumptions in both escalated (year-of-expenditure [YOE]) dollars and $2020, respectively.[1]

A Peer Review Process (PRP) for the draft 2021 Regional Plan was held on May 5, 2020, to review and resolve, discuss, and gain consensus on revenue assumptions, appropriate base year data sources, and estimated growth rates. The PRP included internal and external stakeholders and subject-matter experts. A second PRP was held on August 2, 2021, to conduct a similar review for the final 2021 Regional Plan.

Each revenue stream has its own unique funding guidelines and purpose. Table V.1 provides details on how our different transportation needs are funded.

[1] The details for each fund type are shown in the paragraphs below and can be found in the "Regional Plan Revenue – FINAL" file developed for the 2021 Regional Plan.

Table V.1: Transportation Fund Sources

Transportation Fund Sources							
	Eligible Uses						
Fund Source	Transit Capital	Transit Ops	Hwy Cap	Hwy Ops	Local S&R	ATP/ Programs	Debt Service
TransNet		X	X		X	X	X
TransNet (Bond Proceeds)	X		X			X	
Transportation Development Act	X	X				X	
Developer Impact Fees					X		
City/County Local Gas Taxes					X	X	
General Fund/ Miscellaneous Local Road Funds	X		X		X	X	
Toll Road Funding (SR 125)			X	X			
Value Capture/ Joint Use Agreement	X		X				
FasTrak® Revenues	X	X	X	X			
Passenger Fares		X					
Motorist Aid Services – Toll Box Program						X	
State Transportation Improvement Program	X		X			X	
State Transit Assistance Program	X	X					
State Highway Operation and Protection Program, and Maintenance and Operations Program			X	X			
Cap-and-Trade	X	X				X	
State FASTLANE	X		X		X		
State Managed Federal Programs					X	X	
Motorist Aid Services – Freeway Service Patrol						X	
Road Maintenance and Rehabilitation Account	X	X	X		X	X	
Federal Transit Administration Discretionary	X						X

Transportation Fund Sources

Fund Source	Eligible Uses						
	Transit Capital	Transit Ops	Hwy Cap	Hwy Ops	Local S&R	ATP/ Programs	Debt Service
Federal Transit Administration Formula Programs	X	X				X	
Congestion Mitigation and Air Quality Improvement/ Regional Surface Transportation Programs	X		X			X	
Federal Highway Administration Discretionary			X				
Other Financing (Grant Anticipation Notes)	X						
Federal Rail Administration	X		X			X	
Corridors and Borders Infrastructure/ Other Freight Funds	X		X				
Transportation Infrastructure Finance and Innovation Act Loan Proceeds	X						
Future Local Revenues for Transportation	X		X		X	X	X
Future Metropolitan Transit System Local Revenues for Transportation	X	X					
Ridehailing Company Service Fees	X						
Future State Revenues for Transportation	X		X				
Regional Road Usage Charge	X					X	
State Housing Revenue for Transportation Infrastructure						X	
Future Federal Revenues for Transportation	X		X				

Local Revenues

The TransNet Program

The *TransNet* Program is a voter-approved half-cent sales tax for transportation purposes in the San Diego region. It was approved by voters in 2004 and will generate $11.1 billion in $2020 for regional transportation improvements for the remaining years of the measure (2021–2050).

- **Total Revenues:** Approximately $11.1 billion ($2020), including bond proceeds (2021–2050)
- **Base Year:** 2020
- **Base Year Data Source:** Actual sales tax receipts to FY 2020; future estimates come from the Quarterly *TransNet* Forecast from July 2021
- **Short-Term Growth Rate:** Through 2022 based on professional judgment of SANDAG staff, which is informed by: (1) California Department of Tax and Fee Administration's (formerly known as the California Board of Equalization) sales tax revenue allocation formula; (2) year-to-date sales tax collections; (3) a forecast provided by SANDAG sales tax revenue consultant MuniServices; and (4) current and forecast general economic conditions
- **Long-Term Growth Rate:** Longer-term estimates beyond FY 2022 are based on three variables: (1) the population forecast from the California Department of Finance; (2) a consensus (simple average) of three independent national forecasts of real rates of growth in per-capita retail sales (nationally recognized forecasts by IHS Markit, Moody's, and Oxford Economic Forecasting); and (3) the average projected inflation rates from the same independent sources

Bond proceeds are based on analysis of program capacity over the life of *TransNet* (2048) and assume ample coverage ratios through the life of the repayment period.

The Transportation Development Act

The Transportation Development Act (TDA) is a statewide one-quarter-percent sales tax to be used for transportation purposes. In the San Diego region, the TDA program is used exclusively for transit, non-motorized, and regional planning purposes. Historically, TDA funds have been assumed to grow at the same rate as *TransNet* funds because TDA funds are also based on the growth of sales taxes. However, the tax base for *TransNet* and TDA is slightly different; whereas *TransNet* is a sales and use tax, TDA is a more traditional sales tax. Over time, small differences in their growth rates have been observed. As such, these variances continue to be monitored. TDA funds may be used for transit operating or capital purposes, but they are not eligible for use on non-transit-related highway or local street and road improvements. The state statute that governs this program also includes specific funding for bike and pedestrian projects and accessible service for individuals with disabilities.

- **Total Revenues:** $4.7 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Actual sales tax receipts to FY 2020
- **Growth Rate:** Future growth rates come from the Quarterly *TransNet* Forecast from July 2021

Developer Impact Fees

The Regional Transportation Congestion Improvement Program (RTCIP), an element of the *TransNet* Ordinance, requires the 18 cities and the County of San Diego to collect an exaction from the private sector for each new housing unit constructed in their jurisdiction. *TransNet* requires SANDAG to adjust the minimum RTCIP fee amount on July 1 of each year, based on an analysis of construction cost indices, such as the Engineering News Record, but no less than 2%. The 2022 base fee of $2,635 per housing unit, approved by the SANDAG Board of Directors at its February 2019 meeting, calculates to an annual revenue of $32.060 million. Revenue growth rate stays at a minimum constant at 2% throughout the estimate and is dependent on housing growth. However, annual revenue does begin to decrease in the estimate in 2038 due to the slower growth rate in housing as determined in the Department of Finance population estimate, which is consistent with the SANDAG Series 14 Regional Growth Forecast for housing. The purpose of this annual adjustment is to ensure that the RTCIP retains its purchasing power to improve the regional arterial system. All local jurisdictions are required to comply.

- **Total Revenue:** $575 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** California Department of Finance population estimates (January 2020) and SANDAG Series 14 Regional Growth Forecast for housing
- **Growth Rate:** Historical Construction Cost Index, 2% per year (based on *TransNet* Ordinance)

City/County Local Gas Taxes

City/County Local Gas Taxes are subventions local agencies receive directly from the state gas tax used for transportation related purposes. These are assumed to be available at the current level of gas tax subventions under the Highway Users Tax Account to cities and the County of San Diego for local streets and road purposes. The 2020 base data is derived from gallons of gasoline consumed in San Diego County based on modeling runs for the 2021 Regional Plan. Historical data was collected from the average price of gasoline over the past 20 years which yielded an average growth rate of 3.2%. Revenues are then based on the SANDAG vehicle miles traveled (VMT) and Fuel Forecast calculated as part of the transportation model runs for the 2021 Regional Plan, as well as the state excise tax and fuel tax swap legislation (ABx8 6, Chapter 11, Statutes of 2010; and ABx8 9, Chapter 12, Statutes of 2010). Due to the increased use of electric vehicles, more fuel-efficient

vehicles, and a steady decrease in gallons of gasoline sold, annual revenues for gas taxes are expected to decrease at an average rate of 2% annually with a plateau in 2035 and decreasing an average of 0.3% until 2050.

- **Total Revenues:** $1.5 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Actual received as reported in the State Controller's report through FY 2020
- **Growth Rate:** Based on future fuel consumption, SANDAG VMT, and Fuel Forecasts (Series 14, ABM 14.2.0), (−2% annually until 2035; −0.3% until 2050)

General Fund/Miscellaneous Local Road Funds

General Fund/Miscellaneous Local Road Funds are general fund revenues dedicated for transportation purposes. These revenues are based on information provided in the State Controller's annual reports for local street and road expenditures and revenues. The average amount of general fund contributions and other revenues (including fines and forfeitures, interest earnings, and other miscellaneous revenue sources) used for local street and road expenditures in recent years is assumed to continue. The 2020 base data is calculated from historical annual local street and road revenues collection for the 18 cities and county as reported from the State Controller's audited report through 2017. A ten-year average increase is then calculated and assumed through 2020. A five-year average is then calculated to analyze more recent trends. The average ten-year average is 4.4% and the five-year average is 9%. A 3% growth rate was assumed for the remainder of the 2021 Regional Plan period to remain fiscally conservative as growth has been uneven due to the pandemic.

- **Total Revenue:** $7.4 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Actual received as reported in the State Controller's report through FY 2017
- **Growth Rate:** 3%

Toll Road (State Route 125) Funding

This funding is derived from toll revenues, and it is expected to be available for SR 125 operations and related projects, as well as future revenue derived from debt financing backed by future toll revenues and expected to be available to cover costs to construct and operate toll roads. Estimates were taken from a traffic and revenue study completed by the consulting firm Stantec that supported the refinancing of SANDAG's outstanding SR 125 loans and issuance of the toll revenue first senior lien bonds, 2017 Series A. Amount included is net after debt service costs and based on the 2017 traffic and revenue estimate.

- **Total Revenue:** $1.3 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Toll estimates for SR 125

Value Capture/Joint Use Agreement

These revenue estimates represent the combined amount expected to be available from partnership opportunities. There are two components of the land value capture revenue estimates. The first source of revenues comes from joint development opportunities at transit stations. These revenue estimates were calculated on the assumption that one out of three new transit stations built through the 2021 Regional Plan would include right-of-way prime for joint development. Ground lease estimates were based on the average of three recent projects in the region. The second source of land value capture revenue estimates comes from an assumption around the creation of an Enhanced Infrastructure Financing District (EIFD) around the Central Mobility Hub. An EIFD works by diverting future increases in property tax revenues that will result from the project due to the increasing property values. Bonding against those future increased property tax revenues can be used to pay for infrastructure improvements. The EIFD revenue estimates used existing property values around the potential Central Mobility Hub site and included assumptions around property turnover rates (which would result in properties being reassessed) and the impact Central Mobility Hub would have on property tax revenue from the increased density (on site) and increased property values for land surrounding the project. Additional revenues were also assumed to be generated from partnership opportunities with commercial freight and broadband partners. The excess weight ancillary revenues assumed that revenues could be generated from commercial trucks that purchase permits for vehicles carrying excess weight at the Otay Mesa East Port of Entry. These estimates were based on existing excess weight fee programs in the United States as well as projected commercial truck traffic at the Otay Mesa East Port of Entry. These revenues would support the provision of ancillary services such as truck refrigeration. The broadband revenues assumed new opportunities to expand fiber infrastructure to support the buildout of the digital infrastructure network needed to support Complete Corridor technology improvements. Estimates were based on the proposed fiber optic mileage for Complete Corridors and an estimated cost per mile for fiber employing a P3 delivery model. The cost per mile assumption was based on other similar fiber infrastructure projects in the nation.

- **Total Revenue:** $1.4 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Agreement with San Diego County Regional Airport Authority, estimated value of Central Mobility Hub EIFD, existing transit joint development revenues (San Diego), existing overweight truck permit program revenues, and existing fiber lease agreements

FasTrak® Revenues

FasTrak® revenues are based on the planned expansion of the Managed Lanes network along the region's major corridors to 2050. The assumptions are based on the Managed Lanes Feasibility Tool, an interactive dashboard model developed by SANDAG's consultant, HNTB, that can be used to forecast Managed Lane performance and revenues. It has been used by agencies around the country to inform implementation of Managed Lane projects, phasing, and the development of associated operational policies. The tool's methodology uses revealed preference data from existing operating Managed Lanes across the country that were specifically selected to be representative based on conditions found to be similar to facilities in the San Diego region. Toll rates are not specifically included in the model, since most of these facilities are dynamically priced and it is found that revenues from existing facilities are generally most closely related to congestion levels, which are the biggest driver in consumer behavior for Managed Lanes. The model analyzes existing traffic and proposed lane configuration for the San Diego facilities that are included in the Managed Lane network to assign traffic volumes. It assumes a baseline volume must be reached before drivers will be willing to pay for the Managed Lanes. Usage of the Managed Lanes is predicted based on the overall level of demand above the baseline volume, available capacity in the Managed Lane, and remaining capacity in the general-purpose lanes. It includes assumptions around high occupancy vehicle and clean air vehicle policies and discounts, traffic levels, growth rates, cost assumptions, and lane capacity. Estimated future revenue is based on the planned opening of Managed Lanes—819 new miles of Managed Lanes through 2050.

- **Total Revenue:** $19.2 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Current traffic volumes and projected traffic growth rates

Passenger Fares

Through 2022, passenger fares are based on the estimates provided by the two transit agencies: North County Transit District (NCTD) and Metropolitan Transit System (MTS). From 2023 forward, the passenger farebox recovery rate is based on model output ridership by route combined with average passenger fares by type. Passenger fares do not include fare subsidies which are included as costs in Appendix U: Cost Estimation Methodology.

- **Total Revenue:** $12.8 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** To 2025, as estimated by the two transit agencies in June 2021 as included in the annual transit agency budgets (June 18, 2021, SANDAG Transportation Committee Agenda Item #5),[2] future years (2026–2050) is calculated at a 35% farebox recovery ratio based on planned existing and new services

[2] An additional 25% in passenger fare revenues were added in the 2022 assumptions to reflect the opening of Mid-Coast Trolley service in late 2021. Furthermore, an additional 25% was added for each year in 2023, 2024, and 2025 to reflect the initiation of select *Rapid* Light services and other operational improvements and program enhancements.

Motorist Aid Services – Call Box Program

California Assembly Bill 1572 (Fletcher, 2012) dissolved the San Diego Service Authority for Freeway Emergencies and transferred its responsibilities to SANDAG effective January 1, 2013. SANDAG provides assistance to travelers experiencing vehicle problems while on the highway and, among other things, fields calls from the call boxes located at various intervals along freeways and rural highways. Motorists also can call "511" for assistance. SANDAG operates the call box system, coordinating with the Freeway Service Patrol. The funding comes from a $1 annual fee on vehicle registrations collected by the California Department of Motor Vehicles (DMV). Estimates include DMV fee revenues with a growth rate of 0.5% from FY 2019 through FY 2050 as well as interest income.

- **Total Revenue:** $160 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Call Box Program five-year plan
- **Growth Rate:** 0.5%

State Revenues

State Transportation Improvement Program

The State Transportation Improvement Program (STIP) includes the county share of the Regional Improvement Program (RIP) and funding from the Interregional Program. These revenues are consistent with the amounts available for new and existing programming through FY 2025 as included in the 2020 STIP Fund Estimate. The San Diego region anticipates receiving at least a minimum formula "County Share" (estimated at approximately 7.41% of available RIP shares) and a proportionate share of the STIP Interregional Improvement Program (IIP) funds (estimated at 50% of the 7.41% regional share rate) over time as well. The total STIP funds assumed include revenue from both the Regional and Interregional STIP shares. The STIP funds are flexible, and they are available for capital projects to increase the capacity of highways, public transit, and local roads. The STIP IIP funding must be used on projects that are consistent with the Interregional Transportation Strategic Plan. The STIP funds also are available for efforts to manage demands on the transportation system and for planning, programming, and monitoring activities.

- **Total Revenues:** $926 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** 2020 STIP Fund Estimate
- **Growth Rate:** For STIP, from 2021 to 2025, revenues are based on the fund estimate from the 2020 STIP. The long-term growth rate assumes 2% per year with a 10% increase every six years beginning in 2030.

State Transit Assistance Program

State Transit Assistance Program funds support transit agencies and can be used for both operating and capital projects. The program provides a share of revenues from diesel sales taxes, and the State Controller distributes these funds based on a statutory allocation formula. The 2020 base of $40.18 million annually for operations and capital costs is based on actual funds that were received through November 2020. The annual revenues are increased at 3% per year through FY 2035 and by 5% from 2036 forward. This reflects historical trends and a gradual increase in these costs as the size and the age of the transit system to be maintained increases over time. The revenues needed for these purposes, as identified by State Controller's Office, are assumed to be available.

- **Total Revenue:** $1.4 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** 2020 Apportionment Estimate from the State Controller's Office
- **Growth Rate:** 3%

State Highway Operation and Protection Program, and Maintenance and Operations Program

These revenues are assumed to be available to meet the Caltrans-identified needs for state highway operations and maintenance. State law requires that these expenditures be given priority over new construction, and they are funded "off the top" of the State Highway Account before any funding for new construction projects is allocated. The 2020 base of $17.32 million annually for operations and administration costs, grows at 3% throughout the estimate. The $98.4 million annually for maintenance costs were increased at 3% per year through FY 2023 and by 5% from 2024 forward. This reflects historical trends and a gradual increase in these costs as the size and the age of the system to be maintained increases over time. The revenues needed for these purposes, as identified by Caltrans, are assumed to be available. For programs to reduce collisions on state highways, as well as other programs related to rehabilitating and operating highways, funds are assumed to be available, consistent with the financially constrained ten-year State Highway Operation and Protection Program (SHOPP). The SHOPP is funded from state and federal sources, including SB 1.

- **Total Revenue:** $11.6 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** The Caltrans District 11 estimate, which includes operations and maintenance of non-major capital and labor costs; major capital costs based on ten-year SHOPP
- **Growth Rate:** 3–5% as detailed above

Cap-and-Trade

The annual state budget includes revenue generated from the state's portion of the proceeds from the Cap-and-Trade Auction Revenues to facilitate greenhouse gas emission reductions. The intercity rail is a competitive program, while the transit program is on a formula basis. The Affordable Housing and Sustainable Communities (AHSC) program supports projects that implement land-use, housing, transportation, and agricultural land preservation practices. Two of three subprograms (the Transit and Intercity Rail Capital Program and AHSC) are competitive in nature, whereas the Low Carbon Transit Operations Program is formula based. The 2020 base of $55.82 million annually in cap-and-trade funding grows at approximately 5% per year throughout the estimate reflecting historical trends, and the estimated amounts included in the 2021 Regional Plan are based on an annualized average based on the region's prior success in capturing the discretionary funds.

- **Total Revenue:** $1.6 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** 2018 State Budget
- **Growth Rate:** Approximately 5% per year (range is from 4.59% to 5.8%)

State FASTLANE

These funds reflect a 20% regional target share of the state's 40% federal funds for the Trade Corridor Enhancement Program (TCEP), funded with a combination of new revenues from state and federal funds managed by the state. The assumed revenues are based on the state's historic and continuing commitment to fund border projects. From FY 2021 through FY 2025, the estimate grows at 2% per year. Beginning in FY 2026, the estimate grows at 3.5% per year, with 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $870 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Based on the state's commitment to fund border projects. The border region received 19% of the state share of TCEP in the 2020 cycle.
- **Growth Rate:** From 2021–2025 the growth rate is assumed at 2% per year. Beginning in 2026, the growth rate is 3.5% annually, with a 10% increase every six years beginning in 2030.

State Managed Federal Programs

State-administered programs for the region include the Highway Bridge Program, Hazard Elimination Program, and Highway Safety Improvement Program. The assumption is that additional Federal Highway Administration discretionary funds will be leveraged with the state's share of Highway Infrastructure Program funding for state managed programs. From FY 2021 through FY 2023, a growth rate of 2% per year is

assumed. Beginning in FY 2024, the estimate grows at 5% per year, with 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $1.6 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Historical receipts for the region
- **Growth Rate:** From 2021–2023 the growth rate is assumed at 2% per year. Beginning in 2024, the growth rate is 5% annually, with a 10% increase every six years beginning in 2030.

Motorist Aid Services – Freeway Service Patrol Program

SANDAG assists travelers experiencing vehicle problems while on the highway. The funding comes from the state's Freeway Service Patrol (FSP) program, with an assumption of $2.5 million in traditional FSP funding and another $2.2 million in FSP funding from the program increase that was included in SB 1.

- **Total Revenue:** $96 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Call Box Program five-year plan

Road Maintenance and Rehabilitation Account

The Road Maintenance and Rehabilitation Account (RMRA) was established by SB 1. The account is funded by new diesel and gas excise taxes, a transportation improvement fee, and an electric vehicle fee. Although the RMRA also provides SHOPP funding, those funds are included in the SHOPP program revenue estimates above. The 2020 base of $180 million annually grows at approximately 2% throughout the estimate. This reflects historical trends. The estimated amounts included in the 2021 Regional Plan for most of the discretionary components are based on annualized averages based on the region's prior success in capturing discretionary funds in similar programs such as the Proposition 1B Corridor Mobility Improvement Account and Trade Corridors Improvement Fund. The Local Partnership Program (LPP) competitive component is based on an assumption that the region will receive over time a similar share of statewide funding as is received through the STIP, which is approximately 7.4%; and the LPP formulaic estimate is based on the FY 2020 apportionment. Growth rates vary—some programs include funding in addition to RMRA.

- **Total Revenue:** $11.6 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** rebuildingca.ca.gov
- **Growth Rate:** Varies by program, as shown in Table V.2

Table V.2: Road Maintenance and Rehabilitation Account

Road Maintenance and Rehabilitation Account			
Program	**Total Revenue ($2020 billions)**	**Short-Term Growth Rate**	**Long-Term Growth Rate**
Solutions for Congested Corridors	$6.51	N/A	10% increase every five years beginning in 2030
Trade Corridor Enhancement Program	$1.16	2%	5%
Active Transportation Program	$0.44	0%–2%	Regional program assumes 2% every year and 10% every five years starting in 2030; statewide program assumes 2% per year and 10% every five years starting in FY 2024
Local Partnership Program	$0.36	N/A	10% increase every five years beginning in 2030
State of Good Repair Program	$0.19	2%	Assumes 2% per year with a 5% increase every six years beginning in 2030
Local Streets and Roads	$2.86	2%	Assumes 2% per year with a 10% increase every six years beginning in 2030
State Rail Assistance Program	$0.10	N/A	0%

Federal Revenues

Federal Transit Administration Discretionary

The Federal Transit Administration (FTA) discretionary program assumed in the 2021 Regional Plan is the Full Funding Grant Agreement (FFGA) for both large and small transit projects which provide funding on a multi-year commitment. The revenues assumed include those from an FFGA for the Mid-Coast Trolley Extension project and for future discretionary programs for major transit projects identified in the 2021 Regional Plan. This assumes that every decade (beginning in 2030) the San Diego region would secure one large New Starts FFGA similar in size to the Mid-Coast Trolley project and three Small Starts projects. This is based on the historical track record for the region, which has been successful in securing FFGAs for previous projects such as the Mission Valley East Trolley, the SPRINTER, Mid-City *Rapid*, and the Mid-Coast Trolley project. The revenues in the 2021 Regional Plan also assume additional FTA discretionary funds are leveraged with the new regional funding measure and the future MTS Local Revenues for Transportation revenues.

- **Total Revenue:** $18.1 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Assumes one large New Starts eligible project and three Small Starts eligible projects per decade, with federal share consistent with current FTA guidance

Federal Transit Administration Formula Programs

These funds are allocated annually from the federal budget, based on urbanized area population, population density, and transit revenue miles of service among other factors. The 2020 base of $432 million does not reflect the normal annual apportionment allocated to San Diego County due to the additional stimulus funding. Fiscal Year 2020 annual formula allocations were used to calculate future revenues for the 2021 Regional Plan. Annually FTA revenues are assumed to grow by 2% per year with a 10% increase every six years due to the passing of federal legislation. This reflects historical trends as transit funding increases significantly with the passing of new federal legislation which occurs approximately every six years. Sections 5307, 5337, and 5339 formula funds are mainly used for capital projects and to purchase transit vehicles. Section 5310 funds are specifically designated to assist nonprofit groups in meeting the transportation needs of the elderly and individuals with disabilities when transportation service is unavailable, insufficient, or inappropriate to meet their needs.

- **Total Revenue:** $3.7 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Actuals from the Federal Register through FY 2020
- **Growth Rate:** Assumes 2% growth per year with a 10% increase every six years beginning in 2030

Congestion Mitigation and Air Quality Improvement Program/Regional Surface Transportation Program

These revenue assumptions are based on estimates provided by Caltrans and included in the 2018 Regional Transportation Improvement Program (RTIP) through FY 2022. The Regional Surface Transportation Program (RSTP) funds are flexible, and they may be used for a wide range of capital projects. The Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds are for projects that help reduce congestion and improve air quality. Eligible projects include the construction of high occupancy vehicle lanes, the purchase of transit vehicles, rail improvements, and Transportation Demand Management, among others. CMAQ also can be used for transit operations for the first three years of new service. The estimate includes Highway Infrastructure Program (HIP) funds from FY 2021 through FY 2023 averaging $2.35 million per year based on the FY 2020 HIP apportionment being programmed over a 3-year period. Beginning in FY 2026, the estimate grows at 5% per year, with 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $3.3 billion ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Estimates from Caltrans through 2022
- **Growth Rate:** Assumes 5% growth per year with a 10% increase every six years beginning in 2030

Federal Highway Administration Discretionary

These federal programs provide funding on a competitive basis for projects of regional and national significance. The estimate is based on the historical track record for the region, which has been successful in securing funds for previous projects such as SR 905 and SR 11. The estimated amounts included in the 2021 Regional Plan are based on an annualized average based on the region's prior success in capturing discretionary funds. The 2024 base of $7.6 million is derived from the average funding awarded and programmed between FY 2011 and FY 2019. The estimate reflects 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $259 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** transportation.gov/RAISEgrants/about
- **Growth Rate:** Assumes a 10% increase every six years beginning in 2030

Other Financing (Grant Anticipation Notes)

Based on discussions with the FTA regarding Mid-Coast Light Rail FFGA, SANDAG assumes only $100 million per year in appropriations. Given that the annual project expenditure is anticipated to be much greater, the 2021 Regional Plan assumes that SANDAG will securitize the federal funding. The amount of $472 million in Grant

Anticipation Notes proceeds is based on the estimated amount needed to fund the project while waiting for the reimbursement from the FTA. Full receipt of the FFGA funds from FTA is expected in 2026. This is a one-time borrowing for this particular project.

- **Total Revenue:** $267 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Mid-Coast Financial Model 9.30.2019

Federal Railroad Administration (FRA/Discretionary)

Federal stimulus programs began a new funding source under the Federal Railroad Administration (FRA) that has awarded funding under the 2009 American Recovery and Reinvestment Act (ARRA) as well as under the 2008 Passenger Rail Investment and Improvement Act (PRIIA). Due to the newness of the program, the estimate is based on actual award; however, as part of the Los Angeles – San Diego – San Luis Obispo Rail Corridor (the second-busiest in the nation), it is anticipated that the projects in the San Diego region will be very competitive for both the ongoing FRA formula program and funding under the high-speed rail. The 2024 base of $4.21 million is derived from the average FRA funding awarded and programmed between FY 2011 and FY 2023 in the 2018 RTIP. Beginning in FY 2025, the estimate grows at 2% per year, with 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $107 million ($2020)
- **Base Year:** 2024
- **Base Year Data Source:** Actual award from ARRA and PRIIA
- **Growth Rate:** Assumes 2% growth per year with a 10% increase every six years beginning in 2030

Corridors and Borders Infrastructure/Other Freight Funds

Under the Fixing America's Surface Transportation Act, up to 5% of the state's "any area" RSTP funds may be set aside for border projects. San Diego, as a major border region, anticipates continuing to be highly competitive for these funds and is assuming an 80% share of the set-aside. The 2020 base estimate of $16 million assumes amounts from the 2020 STIP Fund Estimate for FY 2020–FY 2025. Beginning in FY 2026, the estimate grows at 5% per year, with 10% increases every six years beginning in FY 2030.

- **Total Revenue:** $710 million ($2020)
- **Base Year:** 2020
- **Base Year Data Source:** Actual receipts under Corridors and Borders Infrastructure escalated by Consumer Price Index
- **Growth Rate:** Assumes 5% growth per year beginning in 2026 with a 10% increase every six years beginning in 2030

Transportation Infrastructure Finance and Innovation Act Loan Proceeds

In June 2017, the region secured a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan of $537 million at 2.72% interest from the U.S. Department of Transportation for the Mid-Coast Trolley. The amount of proceeds is based on the amount needed to repay the cost of short-term notes needed to finance the local share for construction of the project. This is a one-time borrowing for this particular project.

- **Total Revenue:** $525 million ($2020)
- **Base Year:** 2021
- **Base Year Data Source:** Actual TIFIA loan agreement terms

New Revenues

Future Local Revenues

A provision in the *TransNet* Ordinance specifies that "SANDAG agrees to act on additional regional funding measures (a ballot measure and/or other secure funding commitments) to meet the long-term requirements for implementing habitat conservation plans in the San Diego region, within the time frame necessary to allow a ballot measure to be considered by the voters no later than four years after passage of the *TransNet* Extension." The 2021 Regional Plan assumes a one-half cent measure following the 2022 election and another one-half cent measure following the 2028 presidential election. SANDAG is committed to seeking this revenue source through the implementation of Action Item #5 included in Appendix B: Implementation Actions which is to secure additional local funding for 2021 Regional Plan investments through a ballot initiative.

- **Total Revenue:** $21.6 billion ($2020)
- **Base Year:** 2023
- **Base Year Data Source:** Consistent with estimated *TransNet* starting in 2023
- **Growth Rate:** Same as *TransNet* above

Future Metropolitan Transit System Local Revenues

Existing law (California Assembly Bill 805 [Gonzalez Fletcher, 2017]) authorizes MTS and NCTD to individually impose a specified transaction and use tax within their respective portions of the County of San Diego with revenues to be used for public transit purposes. MTS is currently exploring placing a measure on an upcoming election ballot. The 2021 Regional Plan assumes one-half cent measure starting after the 2024 presidential election. SANDAG is committed to seeking this revenue source through the implementation of Action Item #5 included in Appendix B: Implementation Actions which is to pursue funding opportunities that align with the goals of the 2021 Regional Plan.

- **Total Revenue:** $6.1 billion ($2020)
- **Base Year:** 2025

- **Base Year Data Source:** Consistent with MTS estimates for their service area, starting in 2025
- **Growth Rate:** 2026 through 2050 annual growth rate of 2.4%

Ridehailing Company Service Fees

Studies find that ridehailing company services contribute to VMT and congestion. Other regions have tried to address this by levying a fee, which is used to mitigate impacts and encourage pooling while generating revenue for transit and other shared-use modes. Ridehailing company service fees would be per-trip for services such as Uber and Lyft that could vary by mileage, occupancy, or other trip factors. As additional studies consider the details of local implementation, the 2021 Regional Plan assumes a fee of $1.25 for non-pooled trips and $0.65 for pooled trips ($2020). These revenues are assumed to start in 2026.

- **Total Revenue:** $1.3 billion ($2020)
- **Base Year:** 2026
- **Base Year Data Source:** SANDAG travel demand model for average number of ridehailing trips
- **Growth Rate:** Fee grows annually at 2.77%

Future State Revenues for Transportation

While the passage of SB 1 created a significant source of on-going state transportation funding, the revenue generated continues to be based on excise tax on gasoline and diesel fuels. Consumption of fuel will decrease as fuel efficiency and the adoption of alternative fuel vehicles increases. California is leading the nation in efforts to reduce greenhouse gas emissions and develop renewable energy—further moving away from gasoline and diesel consumption. The state will likely need to act to replace or supplement the current gas tax to maintain the state highway system. Whether through an increase to the gas tax or a move to a user-based fee, the plan assumes action by the state by 2030.

The October 2018 Mineta Institute Report: The Future of California Transportation Revenue projected future gas and diesel tax revenues and statewide VMT. The original figures from the Mineta data tables were adjusted to $2020 and then used to determine the “gap” between the 2020 rate per VMT and the estimated future rate per VMT.

The state has been concerned for quite some time about the purchasing power of existing fuel taxes and has been investigating things like road usage charges as a means of filling the future funding gap.

Road use charging recognizes that any type of vehicle, whether powered by gas, electricity, or hydrogen, causes congestion and places wear and tear on transportation infrastructure. California Senate Bill 1077 (DeSaulnier, 2014) (SB 1077) authorized a pilot

project in 2017 to investigate, design, and provide recommendations to the California State Transportation Agency and Caltrans regarding how to implement a road usage fee in California. California Senate Bill 1328 (Beall, 2018) extended the Road Charge Technical Advisory Committee operations until January 2023. The Committee is continuing to gather public comment.

A state road usage charge or other state transportation funding increase is assumed at a level that covers the funding gap created as fuel taxes depreciate over time due to greater fuel efficiency. California is not alone in testing this kind of program in order to maintain or increase transportation funding. A variety of states are in various phases of piloting and deploying a transition to a road usage charge, including Utah, Texas, Oregon, and a Kansas/Minnesota joint effort. The 2021 Regional Plan assumes additional revenues will start in 2030 to fund the gap.

- **Total Revenue:** $5 billion ($2020)
- **Base Year:** 2030
- **Base Year Data Source:** SB 1077; similar legislation in other states
- **Growth Rate:** First year of implementation is 2030

Regional Road Usage Charge

As technology to administer mileage-based usage fees improves, California metropolitan planning organizations are exploring regional road usage charges as a tool to meet climate goals and manage congestion while generating flexible revenue for local projects. As California selects an approach for the technology, collection methods, and account management system that will be used for the state mileage-based usage fee, SANDAG will work toward leveraging the statewide system for a regional road usage charge to benefit San Diego. While additional studies will be required to develop the details of the fee structure and revenue distribution of the regional implementation, the 2021 Regional Plan assumes a fee of 3.3 cents ($2020) per mile traveled beginning in 2030. The 2021 Regional Plan assumes the fee to start in 2030, aligning with the implementation of the state mileage-based usage fee. The combined road usage charge between the state and the regional road usage charge remains constant at four cents ($2020) per mile through 2050. By 2050 the regional per mile fee is reduced to 2.8 cents ($2020) per mile. SANDAG is committed to seeking this revenue source through the implementation of Action Item #4 included in Appendix B: Implementation Actions which is to pursue legislation or another mechanism to administer a regional road usage charge.

- **Total Revenue:** $14.2 billion ($2020)
- **Base Year:** 2030
- **Base Year Data Source:** SANDAG travel demand model for VMT
- **Growth Rate:** First year of implementation is 2030 at 3.3 cents ($2020) per mile

State Housing Revenue for Transportation Infrastructure

Beginning in FY 2025 and through FY 2030, California Senate Bill 795 (Beall, 2020) (SB 795) allocates funding for the redevelopment, development, acquisition, rehabilitation, and preservation of workforce and affordable housing; certain transit-oriented development; and projects promoting strong neighborhoods. Currently we are estimating the need for $3.8 billion ($2020) for low-income housing construction assistance for the Regional Housing Needs Assessment.

- **Total Revenue:** $3.6 billion ($2020)
- **Base Year:** 2025
- **Base Year Data Source:** Historical receipts for the region
- **Growth Rate:** 2% until 2030. No revenue is assumed beyond 2030

Future Federal Revenues for Transportation

The federal gas tax that supports transportation has not increased since 1993, has not been indexed, and over time the funding has been unable to keep up with transportation needs around the nation. Every year since 2008, Congress has "fixed" the program by transferring money from the general fund to the Highway Trust Fund. Current federal revenues are assuming increases based on no change to the federal gas tax and historical increases but are still running short of the need. In light of the dire situation, there has been discussion at the federal level of options to address the funding gap while meeting the transportation infrastructure need, including increase to the gas tax. A number of experts have proposed increasing the tax to maintain the current infrastructure. The 2026 base of $244 million is based on a combination of VMT and millions of gasoline and diesel consumed using the model runs for the 2021 Regional Plan. The additional fee charged remains constant per year through FY 2023 and is assumed to increase by 6 cents every six years. This increase to the fee every six years allows a continuous stream of revenues due to the decrease in consumption of gasoline over time. Without a proposal or other viable programs, the 2021 Regional Plan assumes an increase to the gas tax starting in 2026 in addition to our current federal revenue assumptions.

- **Total Revenue:** $4.2 billion ($2020)
- **Base Year:** 2026
- **Base Year Data Source:** Public discussion by members of Congress and the president to introduce legislation to increase the gas tax, a carbon tax, or a tax on other fuels based on life cycle for carbon emissions in order to fund a modern and strong transportation system
- **Growth Rate:** Fuel tax is assumed to be adjusted as follows: 15 cent increase over current levels in 2026; additional 6 cent increases in 2030, 2036, 2042, and 2048

Table V.3: Revenue Sources: Availability Assumptions and Risk Assessment

Revenue Sources: Availability Assumptions and Risk Assessment				
Revenue Source	**New or Existing**	**Availability Assumption**	**Potential Risk**	**Risk Mitigation**
Future Local Sales Tax Measures (regional and transit-specific)	New	Voters approve new sales tax measures for development and construction of regional transportation system priorities	Boards may choose to delay the vote; voters may reject the proposition	Ensure sponsor for the outreach and polling efforts have good data and history of success
Ridehailing Company Service Fees	New	Region establishes program similar to other jurisdictions to address congestion and VMT	Boards may choose to delay the vote; voters may reject the proposition	Alternative funding sources or delay projects
Value Capture/ Joint Use Agreements	New	Agreements with the private sector to extract value from underutilized assets, including transit-oriented development, broadband, and freight services	Local business partners fail or the partnerships do not materialize	Alternative funding sources substituted; Regional Plan amended if needed
Road Usage Charges (regional and state)	New	The state pilot program is a success and can be implemented	Pilot program data does not reflect sufficient revenues	Alternative funding sources or delay projects
Transportation Sales Tax	Existing/Future	Current sales tax expires in 2048, assume continuation to 2050 given successful passage of the first two sales tax ballot measures	The ballot measure fails	Funds continue based on past experience
Federal Funds Discretionary	Existing/Future	Reasonably available based on recent past and current allocations for the region	Lack of authorization or award	Alternative funding sources or delay projects

Summary

The 2021 Regional Plan revenues are shown in Tables V.4 and V.5 and reflect the assumptions in both escalated (YOE) dollars and $2020 respectively.

Table V.4: Major Revenue Sources (in Millions of YOE Dollars)

Major Revenue Sources (in Millions of YOE Dollars)				
	FY 2021–2025	**FY 2026–2035**	**FY 2036–2050**	**Total**
Local				
TransNet	$1,661	$4,221	$9,033	$14,915
TransNet (Bond Proceeds)	$53	$0	$0	$53
Transportation Development Act	$815	$2,070	$4,430	$7,314
Developer Impact Fees	$166	$379	$236	$781
City/County Local Gas Taxes	$452	$749	$1,003	$2,204
General Fund/Miscellaneous Local Road Funds	$1,291	$3,232	$7,046	$11,569
Toll Road (SR 125) Funding	$136	$369	$1,517	$2,022
Value Capture/ Joint Use Agreement	$514	$365	$1,381	$2,261
FasTrak® Net Revenues	$75	$4,923	$29,209	$34,207
Passenger Fares	$519	$4,979	$16,232	$21,731
Motorist Aid Services – Toll Box Program	$46	$77	$107	$230
Subtotal	**$5,729**	**$21,364**	**$70,194**	**$97,287**
State				
State Transportation Improvement Program	$142	$403	$919	$1,464
State Transit Assistance Program	$220	$550	$1,418	$2,188
State Highway Account for Operations/Maintenance	$1,676	$4,537	$12,534	$18,747
Cap-and-Trade	$293	$700	$1,541	$2,535
State FASTLANE	$133	$348	$914	$1,394
State Managed Federal Programs	$232	$594	$1,843	$2,669
Freeway Service Patrol	$24	$47	$71	$141
Road Maintenance and Rehabilitation Account	$3,143	$6,060	$7,922	$17,126
Subtotal	**$5,862**	**$13,240**	**$27,163**	**$46,264**

Major Revenue Sources (in Millions of YOE Dollars)				
	FY 2021–2025	**FY 2026–2035**	**FY 2036–2050**	**Total**
Federal				
Federal Transit Administration Discretionary	$1,958	$13,777	$11,608	$27,344
Federal Transit Administration Formula Programs	$636	$1,551	$3,609	$5,796
Congestion Mitigation and Air Quality Improvement/Regional Surface Transportation Programs	$421	$1,228	$3,818	$5,466
Federal Highway Administration Discretionary	$55	$119	$221	$394
Other Financing (Grant Anticipation Notes)	$248	$32	$0	$280
Federal Rail Administration	$9	$50	$115	$174
Corridors and Borders Infrastructure/ Other Freight Funds	$80	$266	$828	$1,174
TIFIA Loan Proceeds	$537	$0	$0	$537
Subtotal	**$3,944**	**$17,023**	**$20,198**	**$41,165**
New				
Future Local Revenues for Transportation	$3,697	$13,090	$11,056	$27,844
Future MTS Local Revenues for Transportation	$279	$3,185	$6,448	$9,912
Ridehailing Company Service Fees	$0	$636	$1,465	$2,101
Future State Revenues for Transportation	$0	$1,511	$7,367	$8,878
Regional Road Usage Charge	$0	$6,003	$18,444	$24,447
Housing Revenue (SB 795 Grants or similar)	$699	$3,712	$0	$4,411
Future Federal Revenues for Transportation	$0	$2,149	$4,870	$7,019
Subtotal	**$4,675**	**$30,287**	**$49,649**	**$84,611**
Grand Total Revenue Sources	**$20,210**	**$81,914**	**$167,203**	**$269,327**

Totals may not add up due to rounding.

Table V.5: Major Revenue Sources (in Millions of 2020 Dollars)

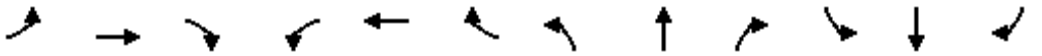
Major Revenue Sources (in Millions of 2020 Dollars)				
	FY 2021–2025	FY 2026–2035	FY 2036–2050	Total
Local				
TransNet	$1,589	$3,492	$5,962	$11,043
TransNet (Bond Proceeds)	$50	$0	$0	$50
Transportation Development Act	$752	$1,560	$2,373	$4,685
Developer Impact Fees	$154	$287	$135	$575
City/County Local Gas Taxes	$419	$571	$545	$1,535
General Fund/Miscellaneous Local Road Funds	$1,193	$2,437	$3,769	$7,398
Toll Road (SR125) Funding	$125	$278	$847	$1,250
Value Capture/ Joint Use Agreement	$451	$268	$729	$1,448
FasTrak® Net Revenues	$69	$3,502	$15,658	$19,229
Passenger Fares	$474	$3,697	$8,631	$12,803
Motorist Aid Services – Toll Box Program	$43	$59	$58	$160
Subtotal	**$5,319**	**$16,152**	**$38,706**	**$60,177**
State				
State Transportation Improvement Program	$132	$304	$491	$926
State Transit Assistance Program	$203	$415	$751	$1,369
State Highway Account for Operations/Maintenance	$1,552	$3,408	$6,642	$11,602
Cap and Trade	$271	$528	$824	$1,622
State FASTLANE	$123	$262	$486	$870
State Managed Federal Programs	$215	$445	$973	$1,633
Freeway Service Patrol	$22	$36	$38	$96
Road Maintenance and Rehabilitation Account	$2,854	$4,544	$4,212	$11,611
Subtotal	**$5,372**	**$9,941**	**$14,417**	**$29,730**
Federal				
Federal Transit Administration Discretionary	$1,775	$10,197	$6,114	$18,086
Federal Transit Administration Formula Programs	$588	$1,169	$1,922	$3,679

Congestion Mitigation and Air Quality Improvement/Regional Surface Transportation Programs	$389	$921	$2,015	$3,324
Federal Highway Administration Discretionary	$50	$90	$119	$259
Other Financing (Grant Anticipation Notes)	$242	$26	$0	$267
Federal Rail Administration	$8	$38	$61	$107
Corridors and Borders Infrastructure/Other Freight Funds	$74	$200	$437	$710
TIFIA Loan Proceeds	$525	$0	$0	$525
Subtotal	**$3,651**	**$12,639**	**$10,667**	**$26,957**
New				
Future Local Revenues for Transportation	$3,472	$10,753	$7,329	$21,554
Future MTS Local Revenues for Transportation	$244	$2,405	$3,459	$6,108
Ridehailing Company Service Fees	$0	$479	$780	$1,259
Future State Revenues for Transportation	$0	$1,079	$3,898	$4,977
Regional Road Usage Charge	$0	$4,307	$9,923	$14,229
Housing Revenue (SB 795 Grants or similar)	$613	$3,000	$0	$3,613
Future Federal Revenues for Transportation	$0	$1,652	$2,574	$4,216
Subtotal	**$4,329**	**$23,664**	**$27,963**	**$55,956**
Grand Total Revenue Sources	**$18,670**	**$62,397**	**$91,753**	**$172,820**

Totals may not add up due to rounding.

APPENDIX K

SUPPLEMENTAL ANALYSIS QUEUING ANALYSIS WORKSHEETS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	574	146	182	2183	0	0	0	0	1524	1	1712
Future Volume (veh/h)	0	574	146	182	2183	0	0	0	0	1524	1	1712
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	624	159	198	2373	0				1658	0	1861
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	2200	770	256	2080	0				1681	0	1461
Arrive On Green	0.00	0.29	0.29	0.15	0.81	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	7930	2652	3456	5274	0				3563	0	3098
Grp Volume(v), veh/h	0	624	159	198	2373	0				1658	0	1861
Grp Sat Flow(s),veh/h/ln	0	1515	1326	1728	1702	0				1781	0	1549
Q Serve(g_s), s	0.0	7.0	5.0	6.1	44.8	0.0				50.6	0.0	51.9
Cycle Q Clear(g_c), s	0.0	7.0	5.0	6.1	44.8	0.0				50.6	0.0	51.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2200	770	256	2080	0				1681	0	1461
V/C Ratio(X)	0.00	0.28	0.21	0.77	1.14	0.00				0.99	0.00	1.27
Avail Cap(c_a), veh/h	0	2200	770	358	2080	0				1681	0	1461
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.62	0.62	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.2	29.5	46.0	10.2	0.0				28.7	0.0	29.0
Incr Delay (d2), s/veh	0.0	0.3	0.6	2.6	67.6	0.0				18.7	0.0	128.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	1.6	2.4	16.6	0.0				24.9	0.0	44.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.5	30.1	48.5	77.8	0.0				47.4	0.0	157.6
LnGrp LOS	A	C	C	D	F	A				D	A	F
Approach Vol, veh/h		783			2571						3519	
Approach Delay, s/veh		30.4			75.5						105.6	
Approach LOS		C			E						F	

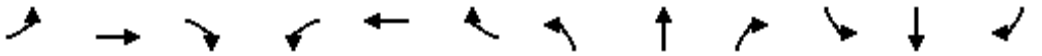
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	12.8	39.2		58.0		52.0						
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2						
Max Green Setting (Gmax), s	* 11	28.7		51.9		44.8						
Max Q Clear Time (g_c+I1), s	8.1	9.0		53.9		46.8						
Green Ext Time (p_c), s	0.1	2.7		0.0		0.0						

Intersection Summary	
HCM 6th Ctrl Delay	85.8
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



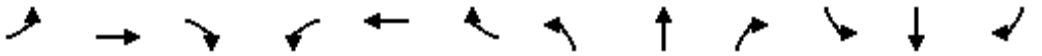
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	1814	0	0	787	609	1502	3	1044	0	0	0
Future Volume (veh/h)	234	1814	0	0	787	609	1502	3	1044	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.95	1.00		0.98			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	254	1972	0	0	855	662	1635	0	1135			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	309	2054	0	0	2011	702	1699	0	1477			
Arrive On Green	0.18	0.80	0.00	0.00	0.27	0.27	0.48	0.00	0.48			
Sat Flow, veh/h	3456	5274	0	0	7930	2644	3563	0	3098			
Grp Volume(v), veh/h	254	1972	0	0	855	662	1635	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1322	1781	0	1549			
Q Serve(g_s), s	7.8	36.5	0.0	0.0	10.3	27.0	48.8	0.0	33.3			
Cycle Q Clear(g_c), s	7.8	36.5	0.0	0.0	10.3	27.0	48.8	0.0	33.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	309	2054	0	0	2011	702	1699	0	1477			
V/C Ratio(X)	0.82	0.96	0.00	0.00	0.43	0.94	0.96	0.00	0.77			
Avail Cap(c_a), veh/h	346	2054	0	0	2011	702	1713	0	1490			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.61	0.61	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	44.3	10.0	0.0	0.0	33.4	39.6	27.8	0.0	23.8			
Incr Delay (d2), s/veh	7.7	8.7	0.0	0.0	0.7	22.5	13.7	0.0	2.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.3	5.2	0.0	0.0	3.7	10.5	23.0	0.0	12.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	18.7	0.0	0.0	34.1	62.1	41.5	0.0	26.0			
LnGrp LOS	D	B	A	A	C	E	D	A	C			
Approach Vol, veh/h		2226			1517			2770				
Approach Delay, s/veh		22.5			46.3			35.2				
Approach LOS		C			D			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		51.4			15.0	36.4		58.6				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		43.8			* 11	27.6		52.9				
Max Q Clear Time (g_c+I1), s		38.5			9.8	29.0		50.8				
Green Ext Time (p_c), s		3.8			0.1	0.0		1.6				

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2158	1011	416	783	0	0	0	0	411	2	372
Future Volume (veh/h)	0	2158	1011	416	783	0	0	0	0	411	2	372
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	2346	1099	452	851	0				448	0	404
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	3998	1419	510	3668	0				573	0	487
Arrive On Green	0.00	0.53	0.53	0.30	1.00	0.00				0.16	0.00	0.16
Sat Flow, veh/h	0	7930	2689	3456	5274	0				3563	0	3032
Grp Volume(v), veh/h	0	2346	1099	452	851	0				448	0	404
Grp Sat Flow(s),veh/h/ln	0	1515	1344	1728	1702	0				1781	0	1516
Q Serve(g_s), s	0.0	23.3	35.9	13.7	0.0	0.0				13.3	0.0	14.2
Cycle Q Clear(g_c), s	0.0	23.3	35.9	13.7	0.0	0.0				13.3	0.0	14.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3998	1419	510	3668	0				573	0	487
V/C Ratio(X)	0.00	0.59	0.77	0.89	0.23	0.00				0.78	0.00	0.83
Avail Cap(c_a), veh/h	0	3998	1419	701	3668	0				806	0	686
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.90	0.90	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.8	20.7	37.9	0.0	0.0				44.3	0.0	44.7
Incr Delay (d2), s/veh	0.0	0.6	4.2	7.4	0.1	0.0				2.0	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.4	10.7	5.2	0.0	0.0				6.0	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.4	24.9	45.3	0.1	0.0				46.3	0.0	48.8
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		3445			1303						852	
Approach Delay, s/veh		20.5			15.8						47.5	
Approach LOS		C			B						D	

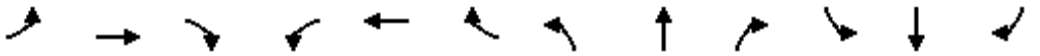
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.9	65.3		23.8		86.2						
Change Period (Y+Rc), s	* 4.7	7.2		6.1		7.2						
Max Green Setting (Gmax), s	* 22	44.8		24.9		71.8						
Max Q Clear Time (g_c+I1), s	15.7	37.9		16.2		2.0						
Green Ext Time (p_c), s	0.5	6.1		1.5		3.7						

Intersection Summary												
HCM 6th Ctrl Delay			23.5									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1467	1106	0	0	865	1522	334	3	194	0	0	0
Future Volume (veh/h)	1467	1106	0	0	865	1522	334	3	194	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.93			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	1595	1202	0	0	940	1545	365	0	211			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	1093	4029	0	0	3223	1139	321	0	266			
Arrive On Green	0.53	1.00	0.00	0.00	0.43	0.43	0.09	0.00	0.09			
Sat Flow, veh/h	3456	5274	0	0	7930	2678	3563	0	2955			
Grp Volume(v), veh/h	1595	1202	0	0	940	1545	365	0	211			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1515	1339	1781	0	1477			
Q Serve(g_s), s	34.8	0.0	0.0	0.0	9.0	46.8	9.9	0.0	7.7			
Cycle Q Clear(g_c), s	34.8	0.0	0.0	0.0	9.0	46.8	9.9	0.0	7.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1093	4029	0	0	3223	1139	321	0	266			
V/C Ratio(X)	1.46	0.30	0.00	0.00	0.29	1.36	1.14	0.00	0.79			
Avail Cap(c_a), veh/h	1093	4029	0	0	3223	1139	321	0	266			
HCM Platoon Ratio	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.9	0.0	0.0	0.0	20.7	31.6	50.0	0.0	49.0			
Incr Delay (d2), s/veh	210.2	0.1	0.0	0.0	0.2	166.1	93.1	0.0	14.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	41.3	0.1	0.0	0.0	3.0	40.2	8.5	0.0	3.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.2	0.1	0.0	0.0	21.0	197.7	143.2	0.0	63.1			
LnGrp LOS	F	A	A	A	C	F	F	A	E			
Approach Vol, veh/h		2797			2485			576				
Approach Delay, s/veh		134.7			130.8			113.8				
Approach LOS		F			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		94.0			40.0	54.0		16.0				
Change Period (Y+Rc), s		7.2			* 5.2	7.2		6.1				
Max Green Setting (Gmax), s		86.8			* 35	46.8		9.9				
Max Q Clear Time (g_c+I1), s		2.0			36.8	48.8		11.9				
Green Ext Time (p_c), s		5.8			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	131.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	6	111	224	186	112	36	2	122	124	268	280	277
Average Queue (ft)	0	24	134	85	8	6	0	53	58	209	211	212
95th Queue (ft)	3	74	202	171	52	23	1	102	102	258	263	263
Link Distance (ft)			497	497	497			452	452	452	452	452
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	290	290				440	440					
Storage Blk Time (%)			0									
Queuing Penalty (veh)			0									

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB	SB
Directions Served	L	LT	R	R
Maximum Queue (ft)	830	1021	1017	830
Average Queue (ft)	705	984	980	652
95th Queue (ft)	973	1044	1079	1016
Link Distance (ft)		973	973	
Upstream Blk Time (%)		35	30	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)	805			805
Storage Blk Time (%)	0	44	9	0
Queuing Penalty (veh)	1	336	80	3

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	128	137	228	229	229	26	260	314	246	162	215	166
Average Queue (ft)	59	72	162	169	179	1	44	200	150	49	87	30
95th Queue (ft)	109	117	206	210	215	15	163	287	229	142	171	116
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0	3				
Queuing Penalty (veh)							0	8				

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	869	1115	965	194
Average Queue (ft)	599	1026	754	93
95th Queue (ft)	1096	1185	1339	174
Link Distance (ft)		1070		
Upstream Blk Time (%)		16		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	35	0	
Queuing Penalty (veh)	1	621	6	

Network Summary

Network wide Queuing Penalty: 1091

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	R	L	L	T	T	T
Maximum Queue (ft)	302	315	548	475	217	383	331	212	231	83	90	76
Average Queue (ft)	299	314	517	220	43	193	132	133	156	43	48	41
95th Queue (ft)	311	314	534	424	147	332	284	200	215	72	75	69
Link Distance (ft)			497	497	497			452	452	452	452	452
Upstream Blk Time (%)			42	0	0							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	290	290				440	440					
Storage Blk Time (%)	5	48	2			0						
Queuing Penalty (veh)	21	207	14			0						

Intersection: 5: I-5 SB Ramps & Genesee Ave

Movement	SB	SB	SB	SB
Directions Served	L	LT	R	R
Maximum Queue (ft)	770	981	963	244
Average Queue (ft)	651	972	949	13
95th Queue (ft)	820	989	1086	165
Link Distance (ft)		973	973	
Upstream Blk Time (%)		99	89	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (ft)	805			805
Storage Blk Time (%)	0	100	0	0
Queuing Penalty (veh)	0	205	0	0

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	470	469	62	81	39	153	198	203	262	598	425	412
Average Queue (ft)	461	461	11	30	6	34	93	108	79	565	425	404
95th Queue (ft)	468	469	39	68	24	120	172	182	178	587	427	433
Link Distance (ft)	452	452	452	452	452			547	547	547		
Upstream Blk Time (%)	40	43								25		
Queuing Penalty (veh)	204	220								0		
Storage Bay Dist (ft)						240	240				400	400
Storage Blk Time (%)							0	0		0	23	2
Queuing Penalty (veh)							0	0		4	39	4

Intersection: 6: I-5 NB Ramps & Genesee Ave

Movement	NB	NB	NB	NB
Directions Served	L	LT	R	R
Maximum Queue (ft)	870	1117	965	91
Average Queue (ft)	764	959	647	32
95th Queue (ft)	1085	1292	1361	72
Link Distance (ft)		1070		
Upstream Blk Time (%)		52		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	845		940	940
Storage Blk Time (%)	0	68	0	
Queuing Penalty (veh)	1	244	1	

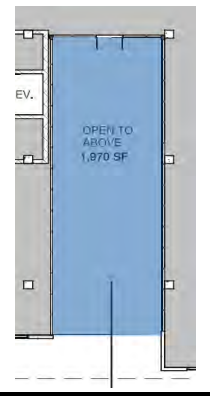
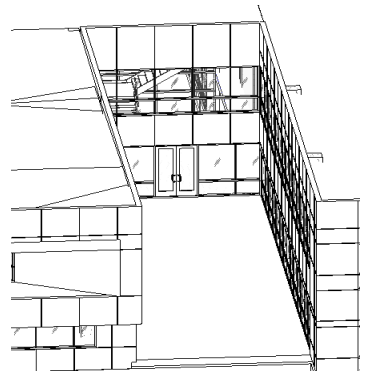
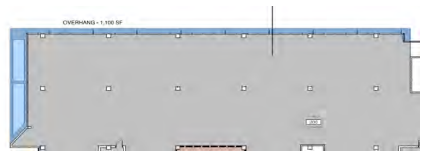
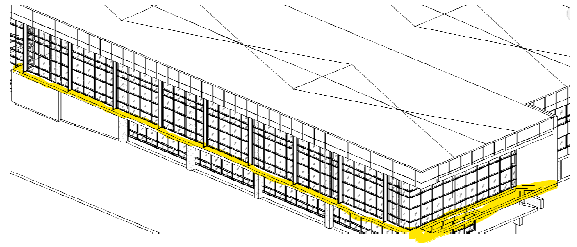
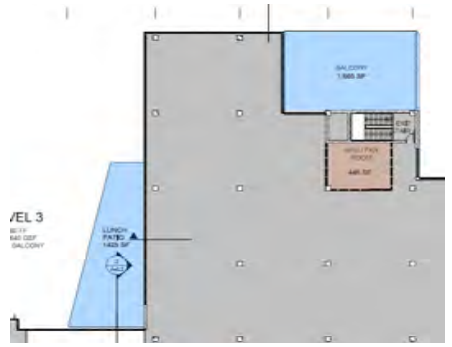
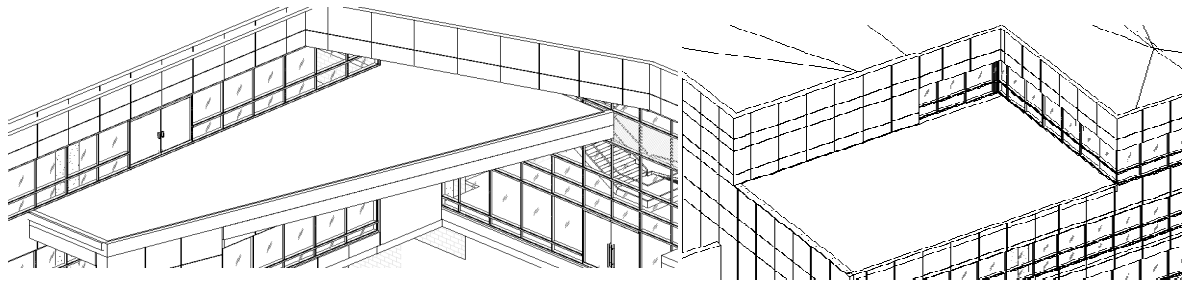
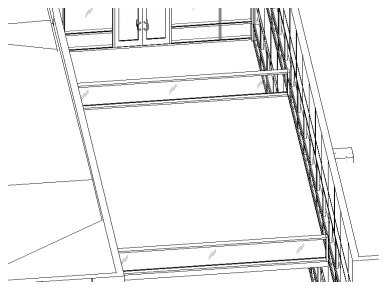
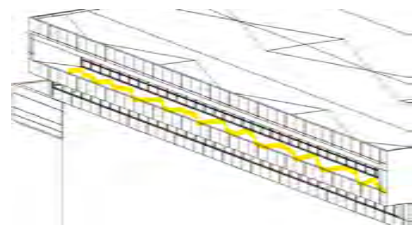
Network Summary

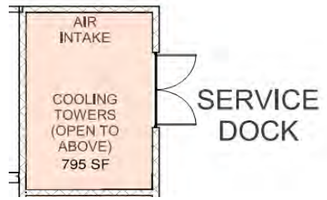
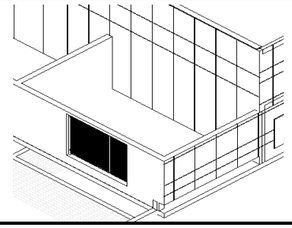
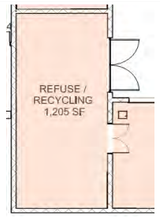
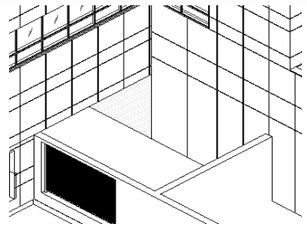
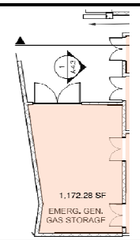
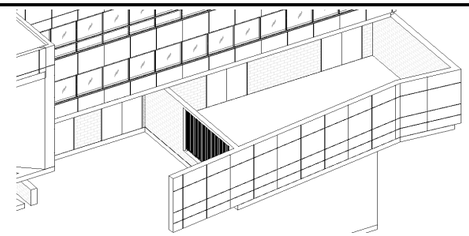
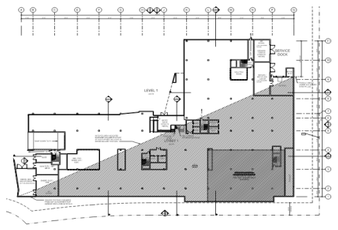
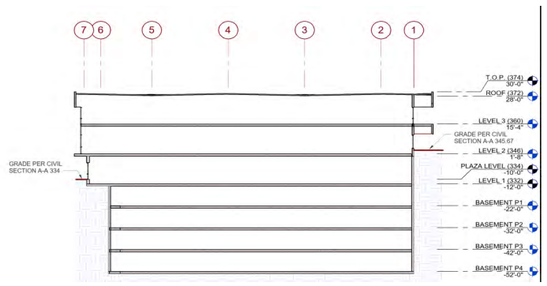
Network wide Queuing Penalty: 1204

APPENDIX L

INTERIOR SERVICE USES

Exterior floor plate areas originally included in GFA

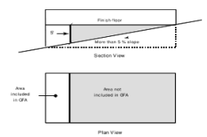
		ORIGINAL PROPOSED SQUARE FOOTAGE: 203,096sf	JUSTIFICATION FOR BEING EXCLUDED FROM GSF	CURRENT LAYOUT	3D VIEW OF SPACE
2nd floor entry inset area		1970.00	Exterior area carved out of the building to provide an arrival point for the 2nd story entrance.		
Overhang area on North East side of building		1100.00	Non-occupiable overhang that was subtracted from the building for design articulation.		
Balcony on South East Corner Level 3 & Lunch Patio		3090.00	Carved out exterior space for balcony to be utilized as employee lunch area and outdoor amenity space.		
Bridge on level 3		700.00	Utilized as a bridge on the third level within the space that was carved out for the 2nd level entry.		
Overhang on West side of 3rd level		1592.00	Non-occupiable space that was carved out on the exterior of the building to enhance the design of the buidling from Torreyana Road.		

COOLING TOWER ENCLOSURE	102	795.00	Typically cooling towers are located on the roof but due to coastal height limitations we have located in the service dock area. Screened in the service dock area for asthetics but open to the air. See example Roof plan attached for similar project type with units located on the roof.		
REFUSE/RECYCLING	103	521.57	Typically located away from the building but due to site constraints and ensuring the best possible views from the site it has been incorporated into the building. Screened in the service dock area but is open to the air. See example Site Plan attached of a similar project type where the trash enclsoure is disconnected from the building. Total SF 1205 - Uncovered portion = 521.57 therefore only 521.57 sf have been excluded from the Gross Square Footage		
EMERGENCY GENERATOR / GAS STORAGE	115	1172.28	Typically generator gas storage is located behind a gate for security purposes. Typically Generators are located away from the buidling near the parking area. See example attached.		
1st Level Basement Floor Area	N/A	40075.00	Basement area per SDMC 113.0234 Calculating Gross Floor Area shaded as shown. Building sections on Sheets A-5.1 & A-5.2 show grade per civil. Elevations A & B on Sheet A-4.2 show the entire first floor being underground on the west elevation. Per Elevation 2 on Sheet A-4.3 the grade is shown on the south elevation how it slopes down towards the east side of the building. The 5' elevation mark is shown as per SDMC 113.0234 that is the threshold for being considered basement area.		
TOTAL SQUARE FOOTAGE AFTER REDUCTIONS		**152080.15**			

(B) For *lots* that slope 5 percent or more along any edge of the building footprint, *gross floor area* includes the area of all portions of a *basement* where the vertical distance between *existing grade* or *proposed grade*, whichever is lower, and the finish-*floor* elevation above exceeds 5 feet, as shown in Diagram 113-02J.

Diagram 113-02J

Basements with 5 Percent or More Slope



END OF APPENDICES